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Subject: CVRWQCB Tentative Order, NPDES No. CA0078441
City of Dunsmuir Wastewater Treatment Plant

Mr. Warner:

The City of Dunsmuir (City) has reviewed the Central Valley Regional Water Quality Control Board (CVRWQCB) Tentative Order No. R5-2012-XXXX, NPDES No. CA0078441. The Order will place many new discharge limitations, monitoring, and reporting requirements on the City's wastewater treatment plant (WWTP), which will have technical and financial impacts. PACE Engineering is submitting these comments on behalf of the City of Dunsmuir.

The City's WWTP has been operating under the current Order No. R5-2006-0129 and Cease and Desist Order (CDO) No. R5-2006-0136, wherein it was determined that effluent copper, zinc, and dichlorobromomethane concentrations exceed permissible limits under the National Toxics Rule, California Toxics Rule, and Basin Plan. Working within these orders, rules, and in consultation with CVRWQCB and California Department of Fish & Game, the City believes it has met every request made by the CVRWQCB through submission of numerous reports including:

- 2009 Mixing Zone Dilution Study Work Plan
- 2009 Mixing Zone Dilution Study
- 2009 Biological Assessment
- 2009 Antidegradation Analysis
- 2010 Pollution Prevention Plan
- 2011 Report of Waste Discharge
- 2012 Mixing Zone Dilution Study Addendum No. 1
- Monthly discharge reports

This work has culminated in the City embarking upon a \$6M capital expenditure project of improvements to the wastewater collection and treatment system, which is being funded through the Clean Water State Revolving Fund (CWSRF) - Project No. C-06-7820-110. The proposed project will reduce inflow and infiltration (I&I) provided failed

laterals on private property are replaced, and improve wastewater treatment process contaminant removal efficiency.

Ratepayers in the City of Dunsmuir are now paying \$40.08 per month per single-family home. The City's estimated 2011 median household income (MHI) is \$27,426 (CWSRF FPA, 2012). Thus, 1.75% of the ratepayer's MHI is spent on sewer rates.

The proposed improvements are being designed now with construction planned to start in 2013. These improvements could not have been feasible without the 75% grant funding provided through the CWSRF. The ratepayers of Dunsmuir appreciate the funding provided through the CWSRF. And yet, even with this past and current effort underway, the Tentative Order places new burdens upon a severely disadvantaged community. What concerns the City the most is that these improvements are constructed using Best Practicable Treatment and Control available under these financial constraints, only to be saddled with new effluent limits that may not be met throughout the year due in part to seasonal temperature change.

With this brief summary of the current status of wastewater treatment by the City of Dunsmuir, the comments that follow are offered in the hope that additional relief can be provided to Dunsmuir through a reasonable adjustment of the Tentative Order and/or grant funding for additional analyses. Portions of the Tentative Order are repeated herein and excerpts are underlined to provide emphasis for the reader.

Ammonia Dilution Credit

Page F-29 of the Tentative Order states that *"While the acute or chronic mixing zone meets the mixing zone requirements of the SIP, the waste water treatment plant does not provide nitrification or otherwise provide for the removal of ammonia. The Facility discharges to a high quality receiving water that supports a world-renown recreational fishing industry. Ammonia is toxic to aquatic life at relatively low concentrations. The Central Valley Water Board finds that it is reasonable for the Discharger to make practicable efforts towards ammonia reductions at the Facility prior to considering granting a mixing zone for ammonia. Such ammonia reduction in the effluent will inherently result in minimizing the size of any future ammonia mixing zone taken under Central Valley Water Board consideration and result in less degradation to the receiving water. Furthermore, the Central Valley Water Board finds that granting a dilution credit for ammonia could allocate an unnecessarily large portion of the receiving water's assimilative capacity of ammonia and could violate the Antidegradation Policy. Therefore, acute and chronic aquatic life dilution credits for ammonia have not been granted."*

The Tentative Order erroneously states the existing wastewater treatment plant does not provide nitrification (Item Vii on Page F-29, Item i.b on page F-48). It is more accurate to note the current wastewater treatment facility does provide seasonal, albeit irregular conversion of ammonia to nitrate via the extended aeration oxidation ditch. Effluent ammonia concentration is typically <1 mg/L and nitrate is typically 20 mg/L during summer conditions with mixed liquor temperature $\approx 20^{\circ}\text{C}$. Effluent is discharged

to percolation ponds from the 30th of April through November 16th. From November 17th to April 29th, when seasonal flows are typically higher and the oxidation ditch temperature ranges from 9 to 11 °C, higher plant flows are typically discharged to the Sacramento River. Between years 2008 and 2009, 18 effluent ammonia data points were obtained with a minimum 0.1 mg/L, maximum 17.6 mg/L, and average 5.2 mg/L - See Figure 1. With winter low temperatures come increased precipitation, inflow, and infiltration, all of which impede, if not stop the nitrification process. During these conditions, river flows are typically very high, much higher than 1Q10 and 7Q10 statistical low flows used to calculate effluent limits as part of the Mixing Zone and Dilution Studies. Historical data between years 2004 to 2008 indicates the majority of City discharges occur at river-to-effluent ratios between 76:1 and 5100:1. Compounding safety factors, i.e. maximum effluent contaminant concentration and low river flow, to arrive at one year-round effluent limit is not practicable considering the activated sludge and nitrification processes are seasonally impeded by temperature nor does it take advantage of seasonal dilution ratios.

With this in mind, the City is modifying the design to add practicable improvements to the WWTP to be constructed as part of the CWSRF Project including:

1. An anoxic selector for denitrification and filamentous control.
2. Mixed liquor recycle to the anoxic selector for nitrate removal.
3. Conversion of a 35-Ft diameter secondary clarifier into an aerobic digester to treat sidestream discharge of supernatant high in ammonia from the anaerobic sludge storage basins and filtrate from the sludge drying beds.
4. Construction of a 60-Ft diameter secondary clarifier to improve solids capture rate throughout the year.
5. Addition of a pH controlled alkalinity dosing station to improve the nitrification process.
6. Addition of powdered activated carbon to remove compounds that are inhibitory to the nitrification process.
7. Potential nitrifier bioaugmentation of the mixed liquor through supernatant recycle from the aerobic digester, especially during the winter.

Trussell considered ammonia removal costs for the Sacramento Regional Wastewater Treatment Plant and found the most cost effective process for removing ammonia (NH₃) from wastewater is to biologically oxidize influent NH₃ to nitrate (NO₃⁻). Trussell also explained factors that enter into successful nitrification and denitrification including temperature, pH, dissolved oxygen, alkalinity (Trussell, 2010). Most of the improvements under design for Dunsmuir summarized above are the same recommended for Sacramento Regional albeit at a much smaller scale.

CVRWQCB and the City have met on numerous occasions leading up to the Tentative Order. We understand that all parties recognize the difficulty in seasonable removal of ammonia. The Tentative Order includes ammonia interim limits and opener provisions for both ammonia (Item B.1.d on Page F-73) and nitrate (Item C.1.h on Page 23) once

improvements have established a reasonable track record. It is understood that the ammonia end of pipe limit of 0.8 mg/L will be modified to take into account the new improvements and a mixing zone dilution credit will be granted for ammonia. If not, it is certain the strict ammonia limit of 0.8 mg/L will not be reliably achieved throughout the year, especially during the winter.

Item C.1.h on Page 23 of the Tentative Order notes that *“Once the Facility upgrades and post-upgrade effluent nitrate and ammonia monitoring is complete, this Order may be reopened to add or modify final nitrate effluent limitations and/or mixing zone as appropriate.”* The City respectfully requests that ammonia be added to this provision as equally as nitrate is mentioned just so it is clear.

Toxicity Reduction Evaluation

Page F-28 of the Tentative Order states that *“Numeric chronic WET effluent limitations have not been included in this order. The SIP contains implementation gaps regarding the appropriate form and implementation of chronic toxicity limits. This has resulted in the petitioning of a NPDES permit in the Los Angeles Region 23 that contained numeric chronic toxicity effluent limitations. To address the petition, the State Water Board adopted WQO 2003-012 directing its staff to revise the toxicity control provisions in the SIP. The State Water Board states the following in WQO 2003-012, “In reviewing this petition and receiving comments from numerous interested persons on the propriety of including numeric effluent limitations for chronic toxicity in NPDES permits for publicly-owned treatment works that discharge to inland waters, we have determined that this issue should be considered in a regulatory setting, in order to allow for full public discussion and deliberation. We intend to modify the SIP to specifically address the issue. We anticipate that review will occur within the next year. We therefore decline to make a determination here regarding the propriety of the final numeric effluent limitations for chronic toxicity contained in these permits.”* The process to revise the SIP is currently underway. Proposed changes include clarifying the appropriate form of effluent toxicity limits in NPDES permits and general expansion and standardization of toxicity control implementation related to the NPDES permitting process. Since the toxicity control provisions in the SIP are under revision, it is infeasible to develop numeric effluent limitations for chronic toxicity. Therefore, this Order requires that the Discharger meet best management practices for compliance with the Basin Plan’s narrative toxicity objective, as allowed under 40 CFR 122.44(k). To ensure compliance with the Basin Plan’s narrative toxicity objective, the Discharger is required to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, Special Provisions VI.C.2.a. of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE work plan. The numeric toxicity monitoring trigger is not an effluent limitation, it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if toxicity has been demonstrated.”

Acute effluent toxicity is tested semiannually on larval stage (0 to 14 days old) rainbow trout (*Oncorhynchus mykiss*) as percent survival after 96-hour exposure in

100% WWTP effluent. The City's current permit establishes a limit of 70% survival for any single bioassay results and a median result of 90% survival for any three consecutive bioassays. Since December 2000, 15 acute toxicity tests have been performed. The acute toxicity results indicated 100% survival in 100% effluent for all of these tests (ROWD, PACE, 2011). The 100% survival rate justifies the results of the Bioassessment that aquatic life uses are not significantly altered due to the presence of the mixing zone (Dean, 2009).

Required annual chronic toxicity tests include the following: 7-day cladoceran (*Ceriodaphia dubia*) survival and reproduction; 7-day fathead minnow (*Pimephales promelas*) survival and growth; and green algal (*Selenastrum capricornutum*) growth. Since the beginning of the current NPDES permit cycle, all test results for *Ceriodaphia dubia*, *Pimephales promelas*, and *Selenastrum capricornutum* have not exceeded 1 chronic toxicity unit (TUc). This demonstrates the discharge has no reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective that states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00.). Chronic toxicity tests have not exceeded 1 TUc (ROWD, PACE, 2011).

The City has performed numerous whole effluent toxicity tests and has not had recent problems passing these tests. However, errors do occur and if a problem test result were to trigger the Toxicity Reduction Evaluation, the City would incur a substantial cost based upon criteria that has yet to be agreed upon by the State Water Board. The City respectfully requests that the Initial Investigative TRE Workplan and all related TRE requirements be suspended until these issues can be resolved to the satisfaction of all parties. If the CVRWQCB is again fixated on problems that do not exist according to numerous chronic and acute bioassays, then it should provide grant funding to pay for such exorbitant tests and report preparation.

A measured chronic reduced dilution ratio of 10 was recorded 20 feet downstream of the diffuser, so a dilution credit could easily be justified for TUc. However the CVRWQCB chose not to grant the credit because tests indicated it is not needed, i.e., all tests have not exceeded 1 TUc. The City should be granted a dilution credit so as not to easily trigger the TRE at a substantial cost.

Monitoring Requirements

The Tentative Order has increased monitoring requirements beyond what was budgeted by the City. If all these tests were done by an outside lab, it would cost an estimated \$60,000 per year, not including sample collection time by City staff. A number of these tests are for such exotic contaminants that even the lab wondered why the overkill – See Tentative Order Table I-1 Priority Pollutants and Attachment J Dioxin and Furan. Again the likelihood of having one or two of these contaminants is less than the

likelihood of erroneous lab data sending all hands on deck to sample for a contaminant that is not there.

The City does not mind collecting the samples and reporting the data, but if the CVRWQCB is fixed on exotic data collection, then the City respectfully requests that grant funding be made available to disadvantaged communities, such as Dunsmuir, to pay for the analyses.

Compliance Schedule for I&I Reduction

On Page 31, the Tentative Order includes a Compliance Schedule for Inflow and Infiltration (I&I) Reduction Project and Wet Weather Capacity Improvements. The Order requires the City to conduct collection system improvements and wet weather capacity improvements. Collection system I&I reduction efforts and upgrades must be completed within 5 years of the effective date of the Order.

The City's 2007 Master Sewer Plan included a comprehensive I&I monitoring program that identified nine sub-areas where I&I was found at unusually high levels. These areas were ranked in order of cost per gallon of I&I removed. Repairs to the readily identifiable I&I reduction areas totaled \$4.5 million.

The CWSRF Project under design originally included approximately \$554,000 in sewer improvements. The City has allocated approximately \$200,000 of Community Development Block Grant (CDBG) funds to replace laterals on private property.

The Tentative Order requires work plans and semi-annual progress reports that detail what steps have been implemented towards achieving I&I reduction compliance with waste discharge requirements, including studies, construction progress, evaluation of measures implemented, and recommendations for additional measures as necessary to achieve full compliance by the final compliance date.

The City is diligently working on I&I reduction, which will only be successful if laterals on private property are replaced. This was made apparent during the design phase of the current CWSRF Project where CCTV found most of the suspect sewer areas to include PVC pipe in good condition and thus confirm that most all of the I&I is coming from private laterals. Fortunately the CWSRF Project included another area that was found to have vitrified clay pipe in poor condition, so sewers in this area will now be replaced. Lateral replacement will be achieved in part through grant funding under CDBG (lateral portion on private property) and CWSRF Project (lateral portion in public right-of-way). Without these programs, the City would be hard-pressed to repair the aging collection system.

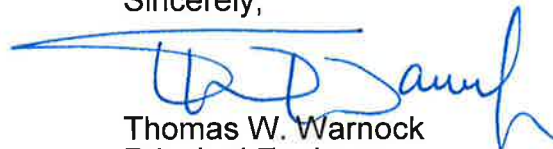
Others have noted that including a compliance schedule for I&I reduction in a NPDES permit potentially opens the City up to civil litigation if it is not achieved. The Tentative

Order acknowledges the City's current I&I reduction improvements and wet weather capacity improvements at the wastewater treatment plant; however, specific I&I reduction limits are excluded. It is advisable not to make such estimates of specific I&I reduction that may or may not be attained given that upwards of 70% of I&I can come from private laterals, which may not qualify for CDBG funding and hence not be replaced in the near term.

The City does not need to incur additional costs preparing work plans, semi-annual reports, and fending off litigation; therefore, elimination of the Compliance Schedule for the I&I Reduction Project and Wet Weather Capacity Improvements is respectfully requested. Acknowledgement that I&I reduction efforts are underway as part of the CWSRF Project is reasonable.

The City of Dunsmuir and PACE Engineering would like to compliment the Redding Branch Office of the Central Valley Regional Water Quality Control Board in its effort to provide up to date guidance in complying with the numerous regulations leading up to the Tentative Order. The City looks forward to completing the current CWSRF Project to the satisfaction of all parties with results that are certain to improve the effluent discharge. Please contact us with any comments or clarifications to our interpretation of the Tentative Order.

Sincerely,



Thomas W. Warnock
Principal Engineer

TWW

Enclosures

c: Brenda Bains, City Manager
Ron LaRue, Utilities Superintendent

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FIGURE 1
City of Dunsmuir
Effluent Ammonia and Nitrate & Oxidation Ditch Temperature

