Heritage Ranch Community Services District

4870 Heritage Road, Paso Robles, CA 93446
(805) 227-6230 ~ Fax (805) 227-6231
www.heritageranchcsd.com

July 21, 2017

Mr. John Robertson, Executive Officer
Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

Subject: Heritage Ranch Community Services District Tentative Order R3-2017-0026 (NPDES No. CA0048941)

Dear Mr. Robertson:

Heritage Ranch Community Services District (District) appreciates the opportunity to review the Tentative Order for the renewal for the District's Wastewater Treatment Facility (WWTF) National Pollutant Discharge Elimination System (NPDES) Permit. While the District is in agreement with many of the requirements of the Tentative Order, we offer the comments presented below regarding the District's inability to consistently comply with final effluent limits for copper and unionized ammonia, other effluent limits, the proposed chronic toxicity test method, and a clarification on monitoring frequency.

EFFLUENT LIMITS

Copper

Table 4 of the Tentative Order (p. 5) contains final effluent limitations for copper of 9 µg/L as an Average Monthly Effluent Limit (AMEL) and 18 µg/L as a Maximum Daily Effluent Limit (MDEL). These effluent limits are carried over from the 2006 permit even though the copper effluent limits calculated based on more recent data were higher (i.e., AMEL = 11 µg/L, MDEL = 22 µg/L). It is stated in the Tentative Order that the previous more stringent limits are carried over to satisfy anti-backsliding requirements that are contained in Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l). Specifically, it is stated that "anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed."

There are exceptions to the anti-backsliding provisions that are applicable to the copper effluent limits. According to CWA Section 402(o)(2)(B)(i) a reissued permit may contain a less stringent effluent limitation if information is available which was not available at the time of the previous permit issuance and which would have justified the application

of a less stringent effluent limit. The effluent limits in the 2006 permit were calculated based on a hardness of 130 mg/L. In the 2011 permit, it is acknowledged that more recent effluent hardness data indicated that the lowest effluent hardness was 160 µg/L. This would constitute new information that was not available in 2006.

New information has been used to relax or remove effluent limits in other Central Coast permits. For example, in Order No. R3-2011 for the City of Paso Robles in Section F.IV.D.1 (p. F-35) it states that effluent limitations for "total dissolved solids, sodium, chloride, and sulfate have been replaced with less stringent water quality-based limitations [because] under CWA §402(o)(2), a permit may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant if :

- Information is available which was not available at the time of permit issuance(other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance, and
- technical mistakes or mistaken interpretations of law were made in issuing the permit.

In this case, natural conditions of geothermal water intrusion in to the discharge area were not considered previously. Consideration of the surface and groundwater quality naturally present allowed relaxation of effluent limits as long as "attainment of water quality standards is ensured and anti-degradation requirements are considered."

Additionally, Order No. R3-2014-0033 for the City of San Luis Obispo in Section F.IV.D.1 (p. F-24) states that several effluent limits were removed "based on the consideration of new information (i.e., current discharge monitoring data and reasonable potential analysis)."

Therefore, the District requests that the new information regarding hardness be taken into consideration and that final effluent limits for copper be set at an AMEL of 11µg/L and MDEL of 22 µg/L consistent with more recent hardness data.

In addition to using a more representative hardness value to calculate effluent limits, use of an intake credit as described in Section 1.4.4 of the State Implementation Plan (SIP) is also applicable. If the water supply is from the same water body as the receiving water for a wastewater discharge, intake water quality may be considered when establishing water quality base effluent limits. The District's water supply is taken entirely from the Nacimiento River which is considered the ultimate receiving water for the WWTF's discharge. Using a calculation based on the approach described in Section 1.4.4 of the SIP, the District determined that consideration of the intake water quality would result in compliance with the MDEL of 22 µg/L and AMEL of 11 µg/L based on effluent data for 2011-2016. The calculation, results and comparison to effluent limits is provided in Attachment B.

Even with the higher limits and the application of an intake credit, the WWTF may still have difficulty consistently complying with the effluent limit. Therefore, the District is requesting a Time Schedule Order (TSO) with interim limits and a compliance plan and schedule to allow the District time to come into compliance with final effluent limits for copper. The justification for the TSO along with the proposed plan and schedule to achieve compliance are presented in Attachment A to this letter.

Unionized ammonia

The Tentative Order contains a final MDEL in Table 4 for un-ionized ammonia of 0.025 mg/L. This is a new limit with which the WWTF is not able to consistently comply. As such the District is requesting interim limits and a compliance schedule to be included in the permit or in a TSO to allow the District time to come into compliance. The justification for the compliance schedule along with the proposed plan and schedule to achieve compliance are presented in Attachment A to this letter.

The request in Attachment A is to include a compliance schedule for unionized ammonia in a Time Schedule Order. However, this constituent should be eligible for an in-permit compliance schedule according to the State Compliance Schedule Policy (Resolution No. 2008-0025) and the justification in Attachment A should be adequate.

In addition, the effluent limit in Table 4 for un-ionized ammonia is inconsistent with the effluent limits in Table F-8 of the Fact Sheet (p. F-24). In Table F-8, the effluent limit of 0.025 mg/L is listed as an AMEL. The District requests that the effluent limits in Table 4 be changed to be consistent with the Fact Sheet, AMEL = 0.025 mg/L and MDEL = 0.05 mg/L).

Nitrate

The final effluent limit for Nitrate is expressed as an MDEL of 8 mg/L. Section IV.C.6.d. of the Fact sheet says that this effluent limit is an interpretation of the narrative objective:

> *"Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses."*

However, no explanation is provided for the numeric effluent limitation except that it is historic.

Additionally, the District is concerned about the ability of meeting the nitrate effluent limit while working on new compliance with un-ionized ammonia. Modifications to the operations of the pond system to reduce un-ionized ammonia may promote nitrification.

Exceptions to the anti-backsliding provisions in CWA Section 402(o)(1) state that water quality based effluent limits may be relaxed in attainment (unimpaired) waters where the action is consistent with the anti-degradation policy. In addition, as noted above, a re-

interpretation of law may also justify relaxation of an effluent limit. A monthly average limit of 10 mg/L would be consistent with the Basin Plan Objective for Nitrate in Table 3-2 which is based on the Maximum Contaminant Level for Drinking Water and would be protective of the beneficial uses that the narrative objective is intended to protect. It would also be consistent with effluent limits adopted for other dischargers in the Region discharging to water bodies with an MUN beneficial use including the City of Lompoc (Order No. R3-2011-0211) and the City of San Luis Obispo (Order No. R3-2014-0033). This limit would provide an equivalent level of protection of the beneficial use and would not result in additional degradation of the receiving water.

Therefore, the District requests that the effluent limit for Nitrate be changed to 10 mg/L as an AMEL.

Flow

An effluent limit for flow is listed in Table 4 of the Tentative Order. In the Fact Sheet, flow is listed in Table F-8 and as item 4.b. (p. F-24). It is requested that, if effluent flow is listed as an effluent limit, the text in 4.b. be used and the limit in Table 4 in the Order (and Table F-8) be removed. However, flow is not a pollutant and, therefore, should not be characterized as an effluent limitation. Instead, the maximum flow requirements could be placed in a new separate section IV.B. called "Discharge Specifications," or could be placed in the operational specifications in section VI.C.4.

CHRONIC TOXICITY TEST METHOD

The effluent limit for chronic toxicity in Table 4 and Attachment E of the Tentative Order is based on results for the Test of Significant Toxicity (TST) which is not an approved method in 40 CFR Part 136. In addition, there have been studies conducted that show that in freshwater toxicity tests, there is a high rate of false positives using the TST. Because of issues experienced with the TST, a coalition of wastewater associations including the Southern California Alliance of Publicly Owned Treatment Works (SCAP), the Central Valley Clean Water Association, the Bay Area Clean Water Agencies (BACWA) and the National Association of Clean Water Agencies (NACWA) filed suit against USEPA in federal court seeking to halt the use of an unapproved toxicity test method for compliance in California NPDES permits. Federal regulations do not identify the TST as an accepted test method, and the lawsuit alleges that use of the TST will result in higher costs to dischargers and potential enforcement jeopardy as a result of the increased frequency of false positives associated with the TST.

Therefore the District requests that until the litigation is resolved and the State Toxicity Policy is finalized, that toxicity requirements be carried over from the 2011 permit.

EFFLUENT MONITORING

In Section IV of Attachment E, the Monitoring and Reporting Program, monitoring frequencies are listed as twice per year for several constituents and quarterly for Nitrate.

The sampling frequency for Nitrate has been increased to quarterly from semi-annually. According to Section F.VII.B. (p.F-32), the frequency was changed as requested by discharger and based on the violation on 8/7/2013. The District has no record of making this request. Therefore, the District requests that the monitoring frequency for Nitrate be maintained at twice per year as it is in the current permit, and sampling be conducted at the same time as the other semi-annual sampling.

If sampling frequency is maintained as in the draft, the District requests additional clarification as follows. Footnote (1) of Table E-3 is attached to TDS and Nitrate and states that 2/year monitoring should be conducted in January and July and quarterly monitoring should be conducted in January, April, July and October. The District requests that, to increase the clarity of the requirements, the footnote be separated into two footnotes; one for twice per year monitoring and one for quarterly monitoring. The footnote for 2/year monitoring should be attached to each constituent on this schedule, or moved to the column heading.

Additionally, the existing permit provides monitoring periods associated with each sampling frequencies (Table E-9). The monitoring period for twice per year sampling is January 1 through June 30 and July 1 through December 31. This provides the District with additional flexibility to collect samples representative of normal operations. The current Draft permit indicates semi-annual samples are to be taken in January and July. The District requests the Draft permit include the monitoring periods consistent with the existing permit.

SUMMARY OF REQUESTS

The District respectfully requests the following changes to the tentative order:

1. Take into consideration the new information and set the final effluent limits for copper to an AMEL of 11µg/L and MDEL of 22 µg/L, consistent with more recent hardness data.
2. Allow an intake credit for copper based on the State Implementation Plan and as summarized in Attachment B.
3. Provide a Time Schedule Order (TSO) with interim limits and a compliance plan and schedule to allow the District time to come into compliance with final effluent limits for copper and un-ionized ammonia. (See justification, Attachment A).
4. Change the un-ionized ammonia effluent limits in Table 4 to be consistent with the Fact Sheet, AMEL = 0.025 mg/L and MDEL = 0.05 mg/L).
5. Set the effluent limit for nitrate to 10 mg/L as an AMEL, based on consistency with the Basin Plan.

6. Remove the effluent limit for flow and place the maximum flow requirements in a new separate section IV.B. called "Discharge Specifications", or with operational specifications in Section VI.C.4.
7. Based on current litigation regarding the Test of Significant Toxicity, maintain the toxicity requirements from the 2011 permit (Table 4 and Attachment E).
8. Adjust the monitoring frequency for nitrate to twice per year, consistent with the current permit.
9. If the sampling frequency is maintained as in the draft, clarify the effluent monitoring frequency requirements in Section IV of Attachment E, by separating the footnote to describe quarterly monitoring and twice per year monitoring requirements, and assign the footnotes to each applicable constituent. (The twice per year monitoring note could be assigned to each constituent or to the column heading).
10. Maintain the monitoring periods associated with each sampling frequency consistent with the current permit (Table E-9 of Attachment E).

The District appreciates this opportunity to provide comments regarding the proposed Tentative Order. We are committed to the protection of water quality, human health and the environment while providing efficient and effective services for our community. If you have any questions regarding the comments presented in this letter, please contact me at (805) 227-6230.

Sincerely,

Scott Duffield, PE
General Manager

Attachments: Attachment A: HRCSD WWTF Request for Time Schedule Order
Attachment B: Calculation of Copper Intake Credits for HRCSD WWTF

Cc: Katie DiSimone, Central Coast Water Quality Control Board (all via email)
Jason Molinari, HRCSD
Eileen Shields, Michael K. Nunley & Associates
Betsy Elzufon, Larry Walker Associates

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Attachment A: Heritage Ranch Community Services District Wastewater Treatment Plant Request for Time Schedule Order

INTRODUCTION

The Heritage Ranch Community Services District (District) owns and operates a wastewater treatment facility (WWTF) which is permitted to discharge to an unnamed drainage tributary to the Nacimiento River under the National Pollutant Discharge Elimination System (NPDES) (Permit No. CA0048941). The District's current permit (Order No. R3-2011-0007) is expiring and the District has received a Tentative Order (Draft Order No. R3-2017-0026) from the Central Coast Regional Water Quality Control Board (Regional Water Board) which contains effluent limits for copper and un-ionized ammonia with which the District will not consistently be able to comply. The District is therefore submitting a Time Schedule Order (TSO) justification to allow time for the District to come into compliance with the proposed effluent limits for copper and un-ionized ammonia.

BACKGROUND

The TSO justification provided here is intended to assist the Regional Water Board in making the findings necessary to issue a TSO that protects the District from mandatory minimum penalties that would otherwise be assessed pursuant to Water Code Section 13385. The Regional Water Board must find that the final effluent limitations are new and/or more stringent limits, and that new or modified control measures cannot be designed, installed, and put into operation within 30 calendar days (Water Code, §13385(j)(3)(B)(i)). Further, the Regional Water Board is required to establish a time schedule for bringing the discharge into compliance that is as short as possible, to establish interim requirements, and to require the District to prepare and implement a pollution prevention plan (Water Code, §13385(j)(3)).

The District's inability to consistently comply with final effluent limits for copper and un-ionized ammonia and its plan to achieve compliance is discussed below.

EFFLUENT LIMIT ATTAINABILITY

The proposed effluent limits for copper and un-ionized ammonia are compared to the maximum observed effluent concentrations (measured during the permit term) in Table 1. The District will not immediately be able to comply with the proposed effluent limits for copper and un-ionized ammonia (NH_3).

Table 1. Effluent Concentrations (2013-2016) and Water Quality-Based Effluent Limits

	Water Quality-Based Effluent Limits		Effluent Quality (Maximum Effluent Concentration)
Constituent	Average Monthly	Maximum Daily	
Copper, µg/L	9.0	18.0	16.8
Un-ionized Ammonia, mg/L	-	0.025	0.49

EPA guidance[1] suggests that an acceptable compliance rate is no more than one exceedance in three years. This corresponds to a statistical probability of compliance with a daily limit of 99.91% and 97.2% for an average monthly limit.

The effluent data collected for total copper during the permit term (semi-annual monitoring) as required by NPDES Permit Order No. R3-2011-0007 are shown with the proposed effluent limits in Figure 1. The three highest observed effluent concentrations exceed the proposed AMEL of 9.0 µg/L, as shown. The statistical probability of daily compliance with the AMEL is 73.5%, and with the MDEL is 88.2%. The District is at risk of non-compliance with the proposed AMEL 26% of the time. Therefore, the District will not be able to consistently comply with the proposed effluent limits.

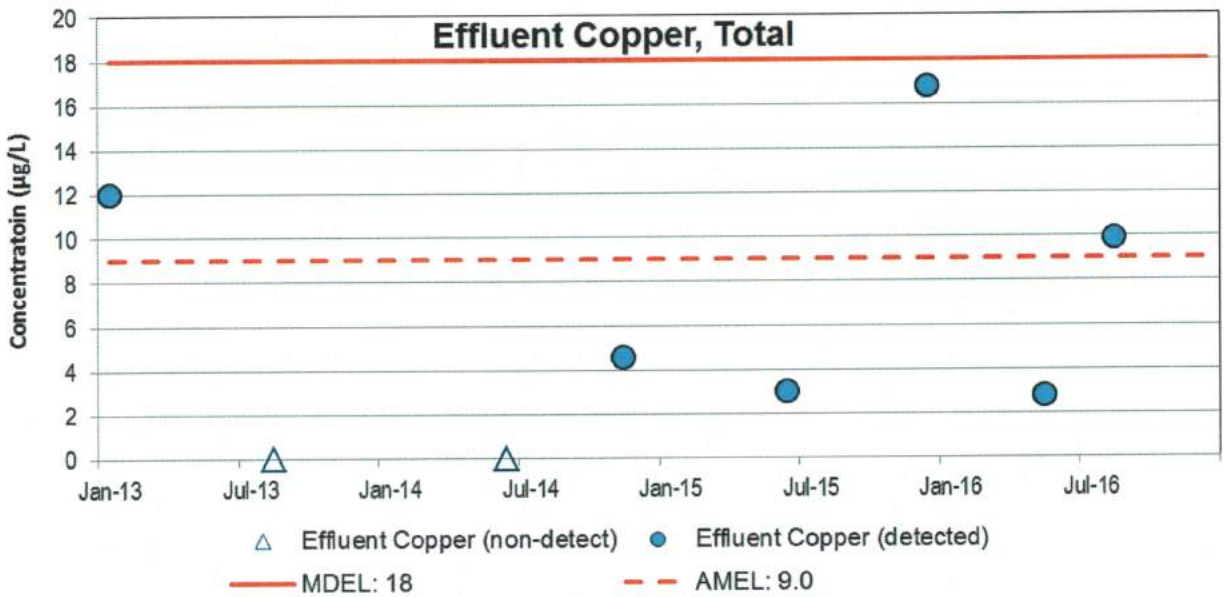

Figure 1. Permit Term Effluent Total Copper Concentrations and Proposed Limits

[1] USEPA, 1991. Technical Support Document for Water Quality Based Toxics Control, March 1991.

The historical copper effluent data from 2006 onward (including data from CIWQS and a source evaluation study) are shown with the proposed effluent limits in Figure 2 in log-scale. It can be seen that the District has historically had difficulty complying with these limits.

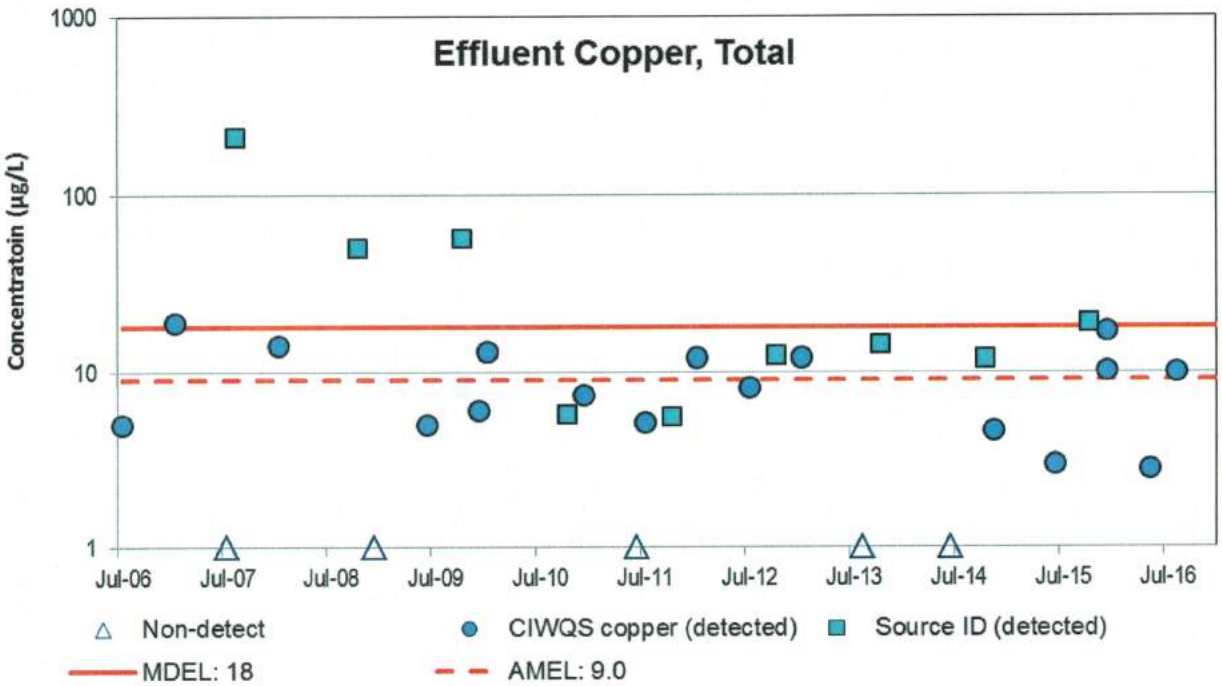

Figure 2. Historic Effluent Total Copper Concentrations and Effluent Limits

The effluent data collected for un-ionized ammonia during semi-annual monitoring, as required by NPDES Permit Order No. R3-2011-0007, are shown with the proposed effluent limits in Figure 3. All but one of the eight semi-annual concentrations were reported above the proposed MDEL of 0.025 mg/L (four of which were detected concentrations), as shown. The statistical probability of compliance with the MDEL is 39%. The District is at risk of non-compliance with the proposed MDEL 61% of the time. Therefore, the District will not be able to consistently comply with the proposed effluent limit.

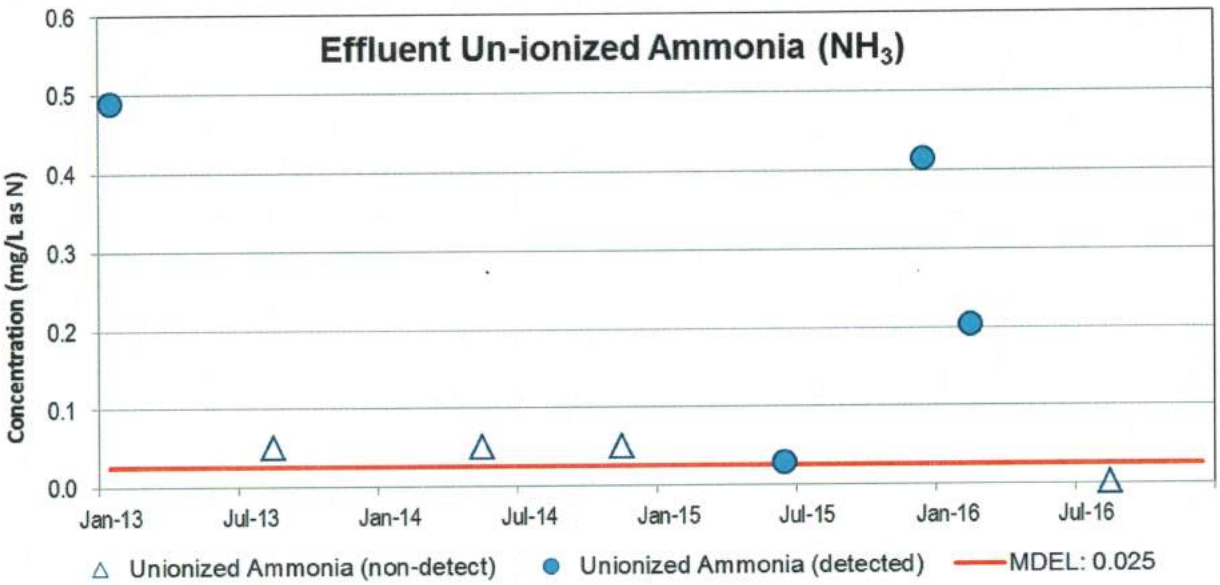

Figure 3. Effluent Un-ionized Ammonia Concentrations and Proposed Limits

SOURCE CONTROL EFFORTS

As noted above, the WWTF has historically had difficulty complying with the copper effluent limit and the District has investigated sources of copper and implemented efforts to reduce copper as described below. Un-ionized ammonia has not been previously identified as a constituent of concern and is not considered to have controllable sources.

A five year in-permit compliance schedule for copper was included in the District's R3-2006-0021 permit, with an interim limit of 25 µg/L. The compliance schedule included identifying potential sources by collection system evaluation, sampling and analysis, and evaluation of wastewater treatment operational practices. Source evaluation monitoring began in February 2007 and a Recycled Water Study was completed in January 2017 by MKN & Associates which evaluated the results (*Heritage Ranch Community Services District Recycled Water Study*). As a large source of copper to treatment plants is typically from the corrosion of copper plumbing, the evaluation involved collecting data from the water distribution system (at consumer taps), wastewater collection (influent) and wastewater effluent (internal sampling and final discharge) between 2007 and 2015. The water distribution system was also sampled between 2007 and 2016 at 15 customer taps. The average concentrations from the study are shown in Table 2.

Table 2. Copper Source Analysis Averages

Location		Date range	No. data points	Average concentration (µg/L)	Overall average concentration (µg/L)
Water system (tap water)	CSD Lab	2007-2015	26	45	
	2131 Wood Duck	2007-2015	30	172	
	15 residential taps	2007-2016	40[a]	341	208
		2010-2016	30	302	178[b]
Influent	Lift Station 2	2007-2015	32	144	
	Lift Station 3	2007-2015	32	124	134
Effluent	Force Main (Brown Gate)	2007-2015	31	21.4	
	Final Discharge	2007-2015	31	27.3	
		2009-2015	26	10.9[c]	

[a] Between 1 and 4 data points per site.
[b] Average of all water system data between 2008 and 2016.
[c] After addition of orthophosphate to effluent (without the high concentrations of February 2007 and 2008, and January 2009).

The water system and influent concentration data are shown in Figure 4. The average water system concentrations are higher than the average influent concentration, indicating that corrosion of copper pipes is likely the primary source of copper to the WWTF.

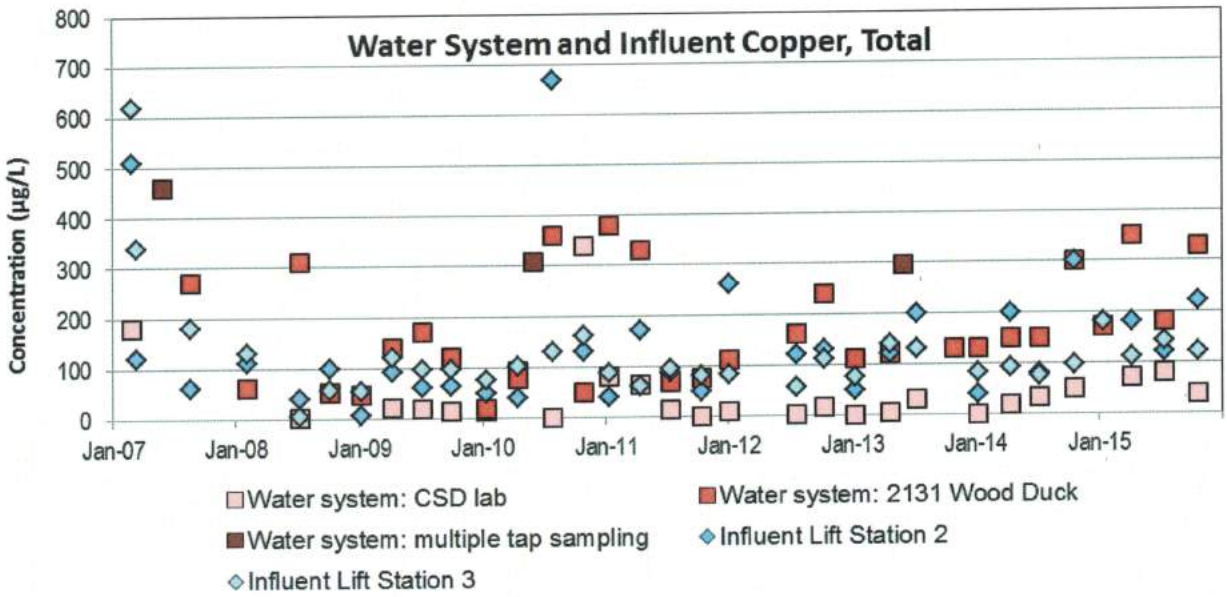

Figure 4. Water System and Influent Copper Concentrations

In order to reduce copper pipe corrosion, the District has been adding orthophosphate to the source water since 2007 sufficient to maintain a 1 mg/L residual concentration (although some locations in the distribution system report lower concentrations). With the exception of a high concentration in January 2009, effluent concentrations decreased significantly in 2008, as shown

by the influent and effluent data from the source evaluation study in Figure 5. The average effluent concentration between February 2009 and October 2015 was 10.9 µg/L, an overall concentration reduction of 94% from the average influent concentration (178 µg/L) over the same time period. This was a significant improvement from previous effluent concentrations.

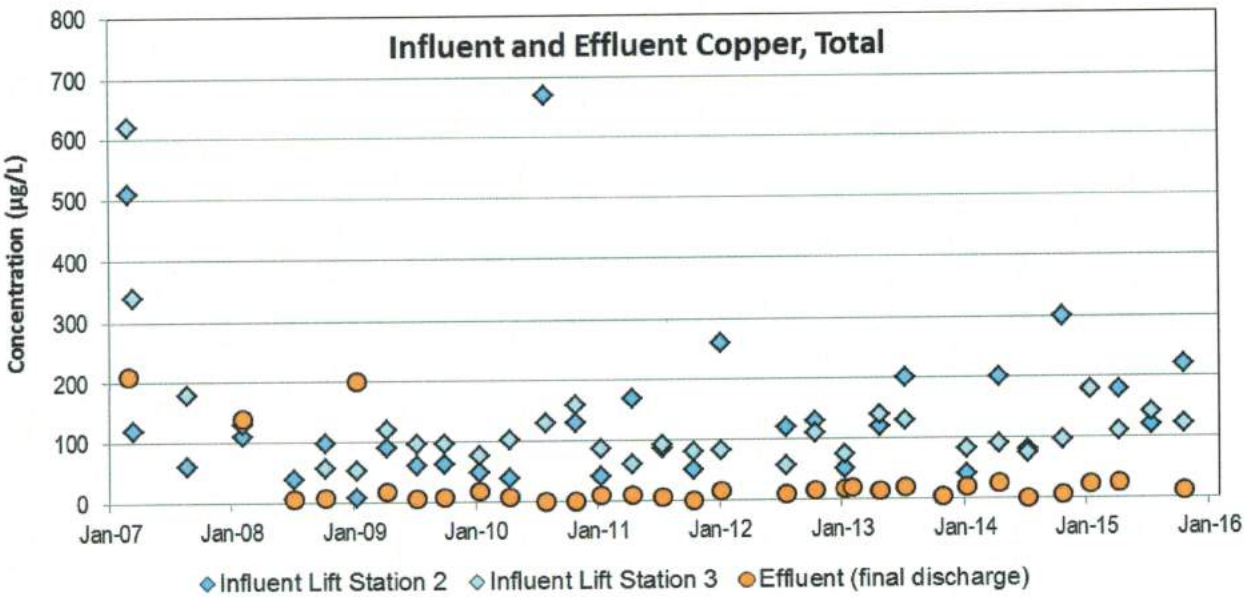

Figure 5. Influent and Effluent Copper Concentrations

The annual average percent reductions from the source evaluation study are shown in Figure 6. This indicates that the WWTF has been effectively removing copper from the wastewater.

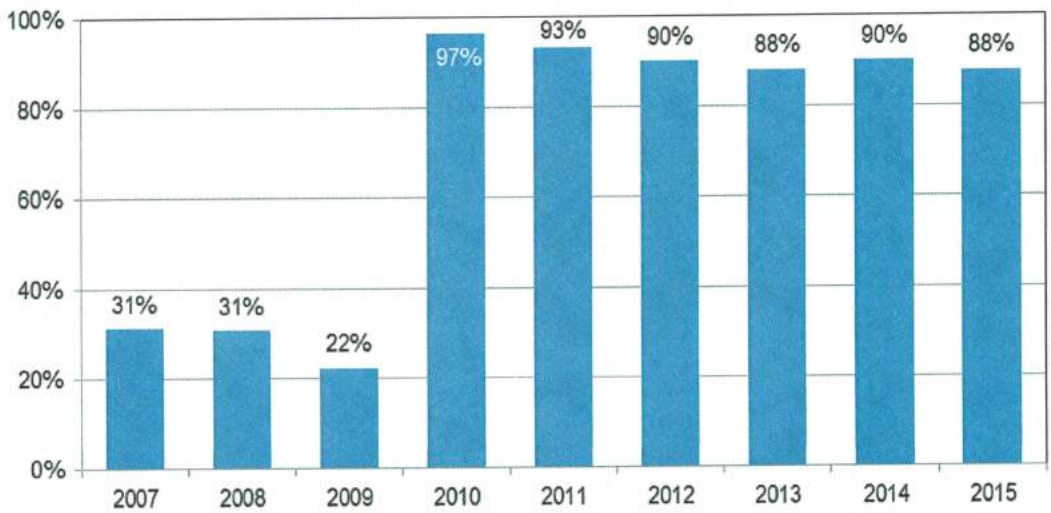

Figure 6. Percent Removal of Copper from Influent

The primary sources of ammonia in wastewater are uncontrollable (e.g., human waste). Reductions will most likely be accomplished through treatment and/or modification/optimization of plant operation, as source control options are extremely limited.

COMPLIANCE PLAN

Total Copper

The most likely source of copper to the WWTF is from copper pipe corrosion, as shown by the source analysis. Copper pipe corrosion in distribution systems is influenced by the pH and alkalinity of the water supply. Corrosion increases as the pH decreases and as alkalinity increases. The pH recorded in the water supply in May 2016 was approximately 7.6. Similarly, the water supply pH at Novato Sanitary District was approximately 7.5, prior to their work with the water purveyer, Sonoma County Water Agency (SCWA), which implemented corrosion control through pH adjustment in September of 1995. Adjustment of the pH to 8.5 resulted in a dramatic reduction in copper loadings. Influent copper loadings were reduced by 55%, while influent copper concentrations decreased from 140 µg/L prior to pH control in 1995 to 57 µg/L in 1996. Effluent copper concentrations decreased from an average of 29 µg/L in 1995 to 12 µg/L in 1996.[2] Therefore, a pH between 8.0 and 8.5 in the water system was shown to significantly reduce corrosion of copper plumbing.

As noted previously, the District began adding orthophosphate to the treated water in 2007, which resulted in a decrease in copper concentrations. However, some locations in the distribution system report residual orthophosphate concentrations below the target concentration of 1 mg/L. Therefore, to further reduce corrosion, the District will evaluate increasing the orthophosphate dose in treated water to achieve a residual concentration of 1.5 mg/L. The District will resume monitoring of the water distribution system to observe the effect on copper concentrations. If copper concentrations do not decrease, the orthophosphate dose may be increased to 2.0 mg/L.

If increasing the orthophosphate dose is infeasible or ineffective, the District will evaluate installing a caustic soda system (NaOH) dosing system at the water system treatment plant to increase the pH of the water system. Caustic soda raises the pH but not the alkalinity. In its source analysis for copper, as part of the Recycled Water Study, MKN & Associates estimated a cost of $75,000 to $125,000 for construction of the system.

The proposed effluent limits (AMEL 9.0 µg/L and MDEL 18 µg/L) were carried over from Order No. R3-2011-0007 and Order No. R3-2006-0012 because they are more stringent than the calculated effluent limits (AMEL 11 µg/L and MDEL 22 µg/L). The difference in the effluent limit calculation between 2006 and 2017 is due to a change in the hardness value used to calculate the CTR criteria (130 mg/L in 2006, 160 mg/L in 2011 and 2017).

The District will consider performing a translator study for copper, as the dissolved to total ratio in the effluent-dominated receiving water may be lower than the default EPA conversion factors of 0.96, resulting in higher water quality criteria and effluent limits greater than the current effluent limits while still being protective of beneficial uses.

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[2] Elzufon, B., Larry Walker Associates. Tools to Measure Source Control Program Effectiveness. Prepared for the Water Environment Research Foundation. Project 98-WSM-2. 2000.

Un-ionized Ammonia

The water quality objective for ammonia established by section II.A.2 of the Basin Plan to prevent toxicity in inland surface waters within the Central Coast region is 0.025 mg/L, as stated: "*The discharge of wastes shall not cause concentrations of unionized ammonia (NH3) to exceed 0.025 mg/L (as N) in receiving waters.*" This receiving water objective has been applied as an end-of-pipe maximum daily effluent limitation due to the ephemeral nature of the receiving water.

Untreated domestic wastewater contains ammonia from domestic activities that are considered to be uncontrollable. Total ammonia (NH3-N) is the combination of un-ionized ammonia (NH3, the more toxic form which occurs in high pH waters) and ionized ammonia (NH_4^+, the less toxic form which occurs in low pH waters). Reductions will most likely occur through treatment or modifications to plant operations, as source control options are extremely limited. The District will evaluate sources of un-ionized ammonia within the treatment process, optimization of current processes and treatment options for its aerated lagoon and polishing pond to further reduce ammonia concentrations. During evaluation and optimization, the District will consider the effects of water system pH on copper and effluent pH on un-ionized ammonia. An increase in water system pH is expected to reduce corrosion of copper pipes and corresponding copper concentrations in effluent. Potential impact of increasing water pH to the influent and effluent wastewater pH should be monitored during these adjustments. An increase in effluent pH (which has a maximum permit limit of 8.3) could result in increased levels of un-ionized ammonia.

In other regions where the water quality objective for ammonia is in the un-ionized form, the corresponding site-specific total ammonia concentration is calculated and applied as an effluent limit. For example, in Region 2, the Basin Plan for the San Francisco Bay contains an un-ionized ammonia objective of 0.025 mg/L as an annual median. This objective is converted to a total ammonia objective using the local salinity, temperature, pH and atmospheric pressure for salt and non-salt waters, and compliance is determined using total ammonia. The District will evaluate the applicability of a site-specific total ammonia objective.

SUMMARY

This evaluation indicates that consistent compliance with the final effluent limit for copper and un-ionized ammonia is not feasible for the District. In the interim, the District requests that the Regional Water Board adopt a TSO to allow the District time to work toward full compliance through the adoption and implementation of the action plans described in Table 3. Table 3 also includes a schedule for implementation of these actions. The District requests that the TSO include performance based interim limits with which the WWTF can comply. Full compliance with the potential final limits is expected within 5 years of the permit effective date. The schedule presented in Table 3 is as short as practicable.

Table 3. Proposed Actions and Estimated Time to Complete Compliance Actions

Constituent	Proposed Action	Estimated Time to Complete
Total Copper	• Quarterly monitoring of the water system, influent and effluent; evaluate trend of orthophosphate dose and system copper residuals	• Ongoing
	• Prepare copper translator study workplan	• 6 months after permit adoption
	• Perform copper translator study	• 1 year after approval of workplan by Regional Water Board
	• If copper residuals are high, increase orthophosphate dose (1.5 mg/L) and evaluate impact to copper concentrations in water system, influent, and effluent	• 1 month before the second quarterly sampling after permit adoption, with monitoring for next 3 to 4 months
	• If copper residuals are still high, increase orthophosphate dose (2.0 mg/L) and evaluate impact to copper concentrations in water system, influent, and effluent	• 1 month before quarterly sampling, if water system concentrations have not decreased sufficiently in two consecutive samples
	• If copper residuals are still high, and copper translator study does not allow compliance, evaluate pH adjustment system using caustic soda (NaOH) ○ Complete concept design and permitting ○ Get funding approval	• 1 year after water system concentrations have not decreased sufficiently in two consecutive samples
	• Design pH adjustment system	• 1 year after completion of permitting and funding approval
	• Install pH adjustment system ○ Install caustic soda dosing system ○ System calibration and adjustment	• 1 year after completion of design
	• Achieve compliance with final effluent limits	• 5 years after permit becomes effective
Un-ionized Ammonia (NH_3)	• Quarterly monitoring of effluent	• Ongoing
	• Develop monitoring plan to review trending in nitrogen cycle	• 6 months after permit adoption
	• Based on monitoring, and any discernable trends, evaluate process optimization and treatment improvement options, including aeration adjustments and effluent pH reduction, and identify options that are technologically and economically feasible	• 2 years after permit adoption

Constituent	Proposed Action	Estimated Time to Complete
Un-ionized Ammonia (NH_3), (continued)	• Evaluate the possibility of a site-specific total ammonia effluent limit	• 6 months after permit adoption
	• If feasible, implement operational changes or design WWTF improvements as necessary	• 3 years after permit adoption
	• Install WWTF improvements, as necessary	• 4 years after permit adoption
	• Achieve compliance with final effluent limits	• 5 years after permit becomes effective

The District respectfully requests that the Regional Water Board timely adopt a TSO that provides the District five years to comply with the final effluent limitation for copper and un-ionized ammonia, and that protects the District from the imposition of mandatory minimum penalties in the intervening period.

Attachment B: Memorandum

LARRY WALKER ASSOCIATES

DATE: July 20, 2017

TO: Betsy Elzufon

COPY TO:

Airy Krich-Brinton
1480 Drew Ave, Suite 100
Davis, CA 95618
530.753.6400 x226
530.753.7030 fax
airyk@LWA.com

SUBJECT: **Calculation of Copper Intake Credits for Heritage Ranch Community Services District's Wastewater Treatment Facility**

INTRODUCTION

The Heritage Ranch Community Services District (District) owns and operates a wastewater treatment facility (WWTF) which is permitted to discharge to an unnamed drainage tributary to the Nacimiento River under the National Pollutant Discharge Elimination System (NPDES) (Permit No. CA0048941). The District's current permit (Order No. R3-2011-0007) is expiring and the District has received a Tentative Order (Draft Order No. R3-2017-0026) from the Central Coast Regional Water Quality Control Board (Regional Water Board) which contains effluent limits for copper with which the District will not consistently be able to comply.

In accordance with Section 1.4.4 of the State Implementation Plan[1] (SIP), the Regional Water Board proposed a method for another discharger by which intake credits may be applied when determining compliance with effluent limits, where a constituent is detected in the source water and the WWTF discharges to the same water body. This memorandum documents the steps taken and assumptions made when calculating intake credits for copper at the District's WWTF.

METHOD

The source water for the WWTF's collection system is the same waterbody into which the treated effluent discharge eventually returns. When effluent is discharged from the WWTF containing copper at the same or lower concentrations as the source water, there is no net increase in concentrations or loads to the receiving water. The effluent copper concentrations can therefore be adjusted to account for the source water contribution, as intake credits.

[1] State Water Resources Control Board, 2005. Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

Intake credits for copper were calculated using an approach based on the discussion in Section 1.4.4 of the SIP. The method is as follows:

a) Determine the average load in intake water for previous month.
b) Determine the average contribution to potable water system for previous month.
c) Determine the daily effluent load discharged.
d) Determine the monthly effluent load discharged.
e) Account for intake in determining the load on day of sampling.
f) Account for intake in determining the monthly load.
g) Account for intake credit in daily concentration.
h) Account for intake credit in monthly concentration.
i) Determine compliance with effluent limits.

Intake Credit Calculation Assumptions

The assumptions and specific calculations made are described below.

a) *Determine the average load in intake water for previous month*: As all WWTF influent comes from the source water, the average monthly load in intake water was calculated from the monthly average effluent flow and intake copper concentrations measured at River Well 1 between May 2011 and May 2017. Non-detected concentrations were set equal to ½ the reporting limit (5 and 10 µg/L) except in November 2016 and May 2017, which had non-detected data at reporting limits significantly higher (50 µg/L) than all previous reporting limits or detected concentrations. These were set equal to 5 µg/L (½ the most recent reporting limits). As samples were not collected during every month, the available result was carried over until another result became available. The equation used to calculate loads was:

Load, lbs/day = Flow, MGD x Concentration, µg/L x 0.00834

b) *Determine the average contribution to potable water system for previous month:* A 10% loss to filter backwash and rewash was assumed when calculating the average monthly load contribution to the potable water system.

c) *Determine the daily effluent load discharged*: Daily effluent flow and daily effluent copper concentration data were used to calculate the daily effluent load, using the equation above. Non-detected concentrations were set equal to the most recent available MDL, 0.019 µg/L.

d) *Determine the monthly effluent load discharged*: The monthly average effluent flow and monthly average effluent copper concentrations were used to calculate the monthly effluent load. Non-detected concentrations were set equal to the most recent available MDL, 0.019 µg/L. There was only one month (December 2015) during which more than one copper concentration was available in effluent.

e) *Account for intake in determining the load on day of sampling*: The load calculated in step b (potable water) was subtracted from the load calculated in step c (daily effluent). If the result was less than zero, the value was set equal to zero.

f) *Account for intake in determining the monthly load*: The load calculated in step b (potable water) was subtracted from the load calculated in step d (monthly average effluent). If the result was less than zero, the value was set equal to zero.

g) *Account for intake credit in daily concentration*: The daily concentration was calculated from the load in step e and the effluent daily flow, as follows:

Concentration, µg/L = Load, lbs/day / Flow, MGD / 0.00834

h) *Account for intake credit in monthly concentration*: The monthly concentration was calculated from the load in step f and the monthly average effluent flow, using the equation above.

i) *Determine compliance with effluent limits*: The resulting daily and monthly concentrations were compared with the proposed effluent limits (MDEL 18 µg/L and AMEL 9 µg/L) to determine compliance. Values exceeding the effluent limits would have been out of compliance.

Intake Credit Calculation with Water Treatment Plant Effluent

The same calculation was performed using copper concentration data collected from the source water treatment plant (WTP) effluent instead of River Well 1. All assumptions remained the same with the exception of step b, which assumed no percent loss as the WTP data already represent the load in the potable water system.

DATA AND RESULTS

The copper concentration and flow data used in the calculation are shown in Table 1.

Table 1. Copper Concentrations and Flow

	Copper concentration, µg/L					
			WWTF Effluent		Flow, MGD	
Date	Source water	WTP	Daily	Monthly average	Daily	Monthly average
5/11/11	<5	<5			0.145	0.145
7/13/11			7.55	7.55	0.178	0.130
12/4/11	<5	<5			0.235	0.137
1/25/12			12	12	0.158	0.184
5/16/12	<5	<5			0.146	0.059
7/6/12			8.1	8.1	0.258	0.166
12/20/12	7	6.4			0.154	0.143
1/9/13			12	12	0.239	0.158
5/23/13	<5	<5			0.145	0.140
8/7/13			0.019	0.019	0.146	0.097
12/19/13	6.7	<5			0.139	0.101
5/21/14	5.2	<5			0.139	0.044
6/3/14			0.019	0.019	0.079	0.124
11/6/14			4.6	4.6	0.053	0.111
12/17/14	8.5	<5			0.251	0.167
5/27/15	10	30			0.129	0.115
6/4/15			3	3	0.216	0.121
11/19/15	<10	<10			0.155	0.152
12/10/15			16.8	13.45	0.162	0.155

	Copper concentration, µg/L					
			WWTF Effluent		Flow, MGD	
Date	Source water	WTP	Daily	Monthly average	Daily	Monthly average
12/15/15			10.1		0.167	0.155
5/12/16	10	<10			0.13	0.120
5/24/16			2.8	2.8	0.12	0.120
8/4/16			9.9	9.9	0.086	0.113
11/15/16	<50	<10			0.11	0.114
5/11/17	<50	<10			0.119	0.131

The effluent copper concentrations resulting from the use of intake credits are shown in Table 2. Effluent concentrations that exceed the effluent limits are shaded. The copper concentrations are also shown in Figures 1 and 2 with the proposed and calculated effluent limits.

Table 2. Effluent Copper Concentrations With and Without Consideration of Intake Credits

	Effluent Concentration		Intake Credit Adjusted Concentration (using River Well 1)		Intake Credit Adjusted Concentration (using WTP effluent)		Proposed Effluent Limits in Tentative Order	
Date	Daily	Monthly average	Daily	Monthly average	Daily	Monthly average	MDEL	AMEL
7/13/11	7.55	7.55	5.9	5.3	5.9	5.3	18	9
1/25/12	12	12	9.4	9.8	9.1	9.5	18	9
7/6/12	8.1	8.1	6.7	5.9	6.5	5.6	18	9
1/9/13	12	12	7.8	5.7	7.8	5.6	18	9
8/7/13	0.019	0.019	0.0	0.0	0.0	0.0	18	9
6/3/14	0.019	0.019	0.0	0.0	0.0	0.0	18	9
11/6/14	4.6	4.6	0.0	0.0	0.0	2.1	18	9
6/4/15	3	3	0.0	0.0	0.0	0.0	18	9
12/10/15	16.8	13.45	12.5	9.0	12.0	8.5	18	9
12/15/15	10.1	-	5.9	-	5.5	-	18	9
5/24/16	2.8	2.8	0.0	0.0	0.0	0.0	18	9
8/4/16	9.9	9.9	0.0	0.9	3.3	4.9	18	9
# Exceedances with proposed effluent limits	***0***	***4***	***0***	***1***	***0***	***1***		

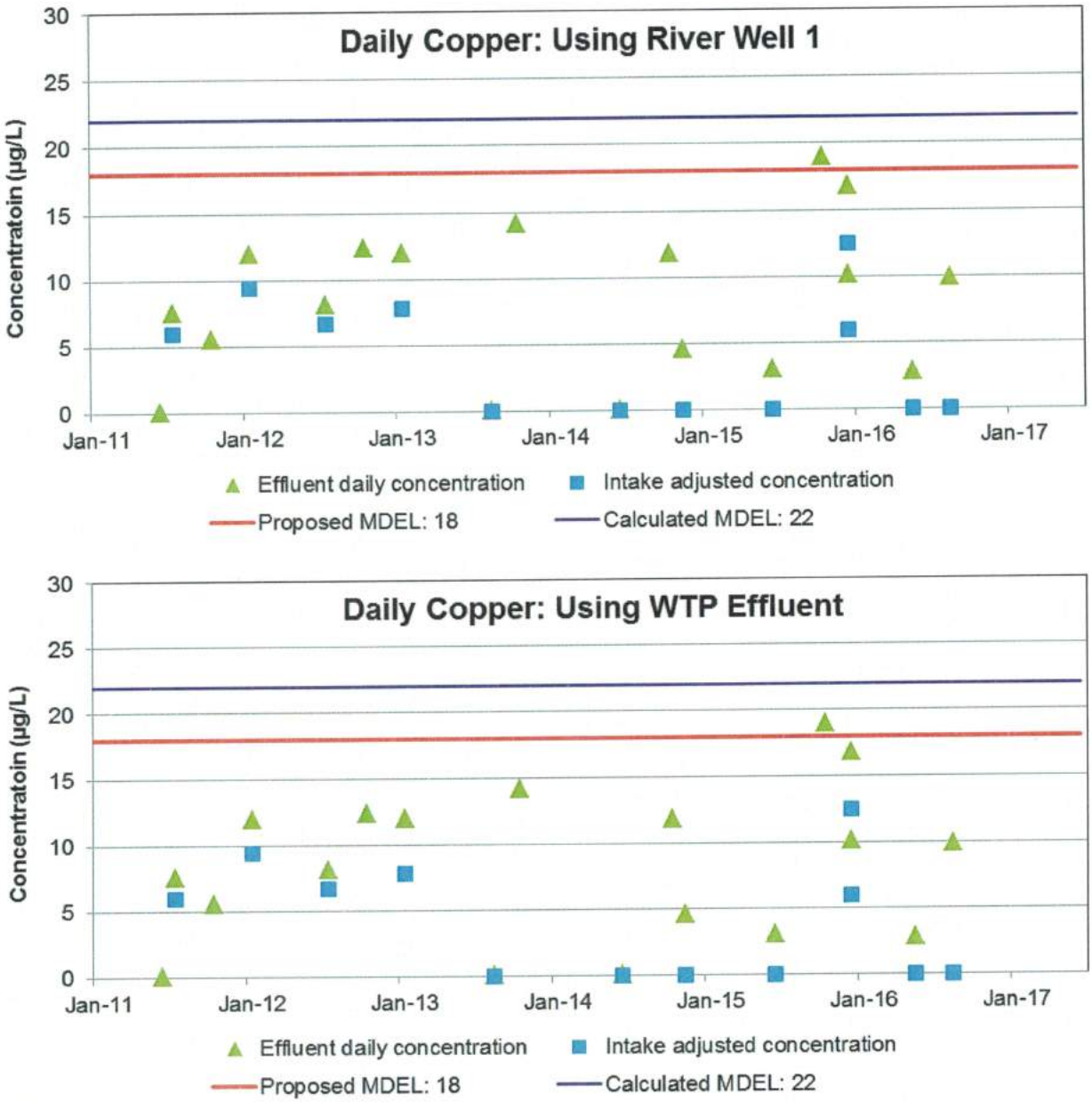

Figure 1. Daily Effluent and Intake Adjusted Concentrations with MDEL

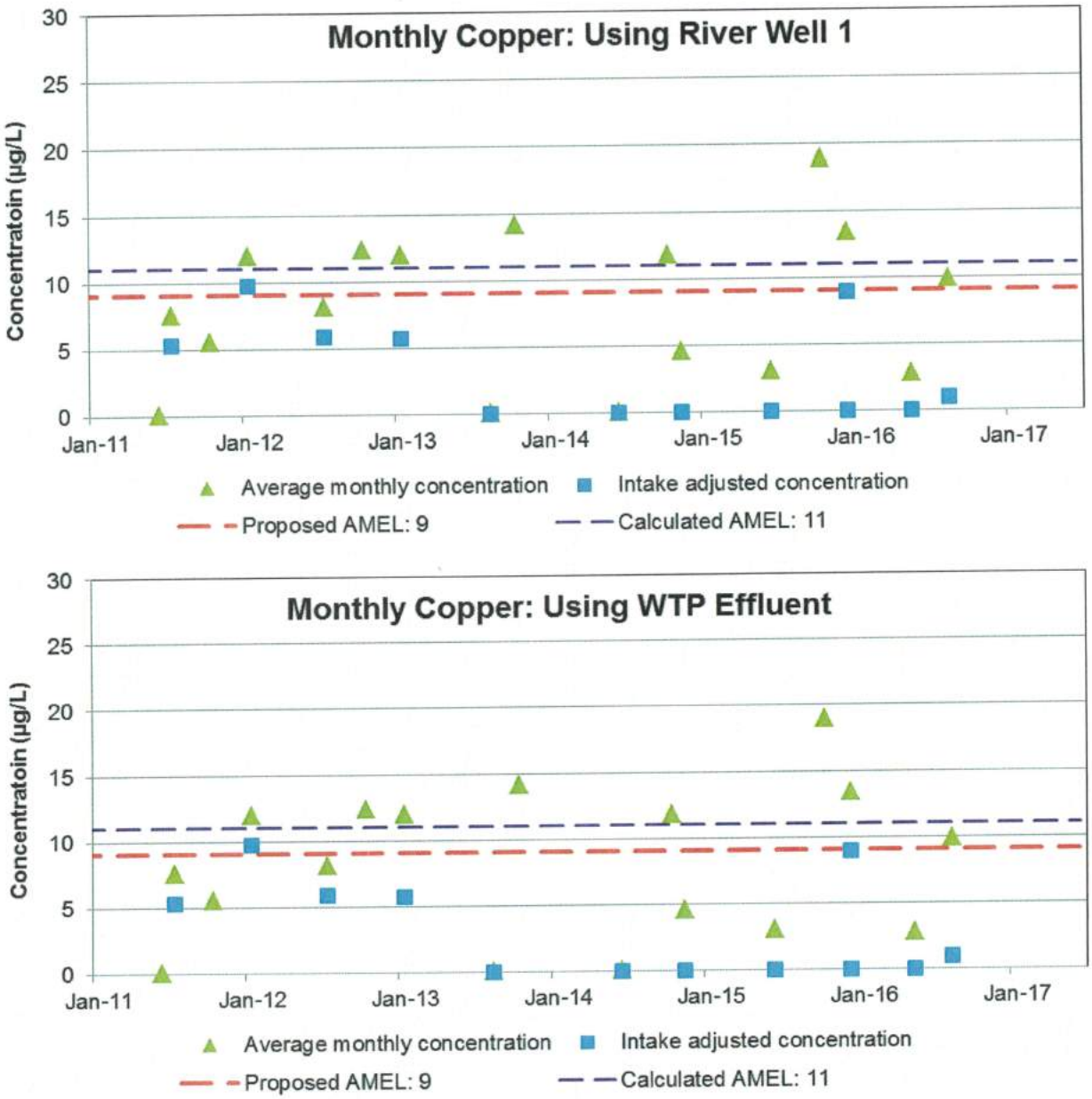

Figure 2. Monthly Average Effluent and Intake Adjusted Concentrations with MDEL

CONCLUSION

The use of intake credits results in a decrease in the number of proposed AMEL (i.e., AMEL = 9 µg/L) exceedances from four to one, as shown in Table 2. If the AMEL and MDEL based on a hardness of 160 mg/L are used, the use of intake credits results in no exceedances of the AMEL (i.e., AMEL = 11 µg/L). The use of River Well 1 as the source water or of WTP effluent as the potable water concentration does not change this result.