Memorandum

DATE: April 20, 2017

TO: Betsy Elzufon

COPY TO:

Airy Krich-Brinton
707 4th Street, Suite 200
Davis, CA 95616
530.753.6400 x226
530.753.7030 fax
airyk@LWA.com

SUBJECT: **Seaside Lagoon Analysis of Compliance with Tentative Interim Limits**

Larry Walker Associates (LWA) has evaluated the probability of compliance with the effluent limits in Seaside Lagoon's Tentative Time Schedule Order based on guidance provided in the Technical Support Document for Water Quality Based Toxics Control (TSD).[1] As discussed below, we have evaluated the ability to conistently comply based on a once in three years exceedance frequency, which is equivalent to a compliance probability of 99.91% with the MDELs and 97.2% with the AMELs.

BACKGROUND

It should be noted that there is little if any guidance in either the TSD or the State Implementation Plan (SIP)[2] for calculating interim limits. The SIP states in Section 2.2.1 that '*Numeric interim limitations for the pollutant must be based on current treatment facility performance or on existing permit limitations, whichever is more stringent.*' But there is no specific information on how to calculate limits based on treatment facility performance. Similarly, while the TSD discusses the calculation of final effluent limits in sections 5.4. and 5.4 and states conditions under which effluent limits may be relaxed (i.e., interim limits) in Section 5.7, there is no description of how the interim limits should be calculated.

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

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

However, the TDS does discuss the appropriate frequency for excursions above criteria. The TSD discusses the format used to express water quality criteria in Appendix D, stating that:

> 'The format that was selected for expressing water quality criteria for aquatic life consists of recommendations concerning concentrations, durations of averaging periods, and average frequencies of allowed excursions. Use of this concentration-duration-frequency format allows water quality criteria for aquatic life to be adequately protective without being as *overprotective* as would be necessary if criteria were expressed using a simpler format [based on concentration only].' (p. D-1)

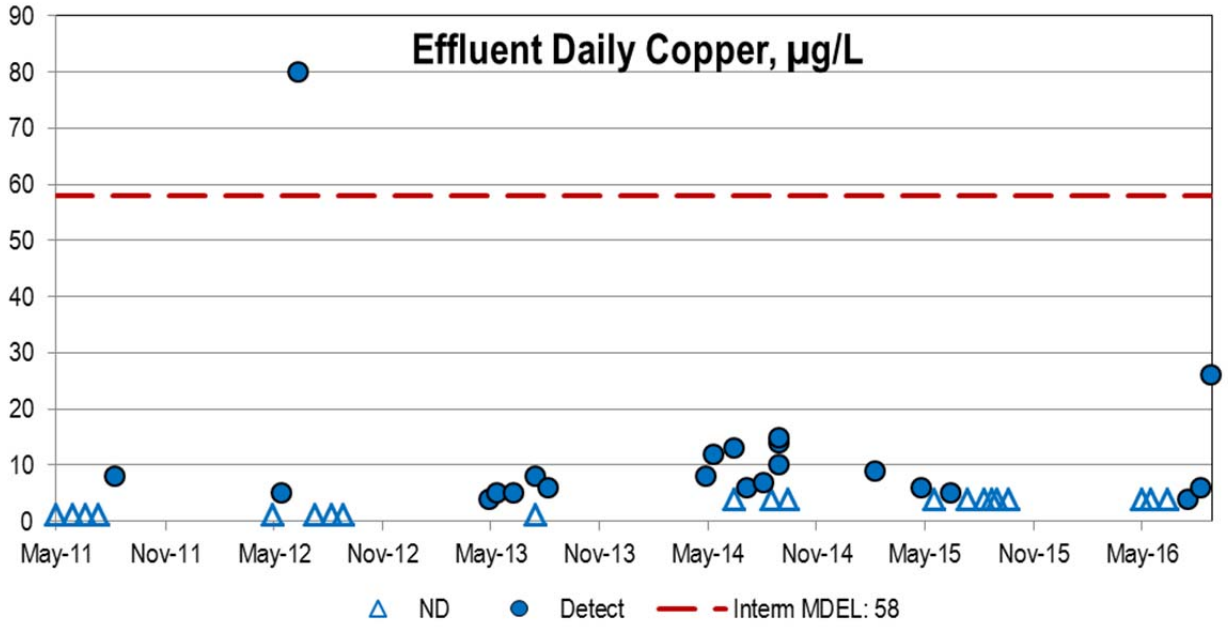
Concentration is 'intended to be the highest concentration that could be maintained indefinitely in a receiving water without causing an unacceptable effect on the aquatic community' but the TSD also notes that "*organisms can tolerate higher concentrations for short periods of time*" (i.e., the duration component of the criteria, average monthly or daily, etc.) and that "*excursions can occur without causing unacceptable effects if … the frequency of such excursions is appropriately limited*." (p. D-1)

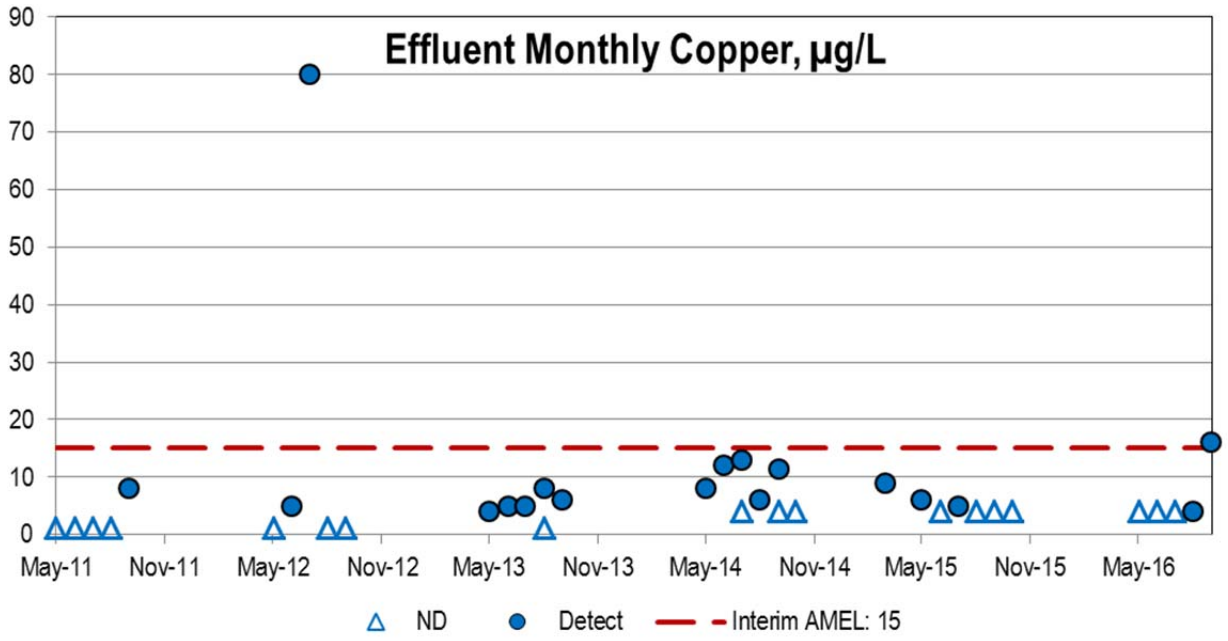
With respect to the appropriate frequency, the TSD states that "*as a general rule, the purpose of the average frequency of allowed excursions will be achieved if the frequency is set at once every 3 years on average*." (p. D-4)

ASSESSMENT OF PROPOSED INTERIM LIMITS

Copper

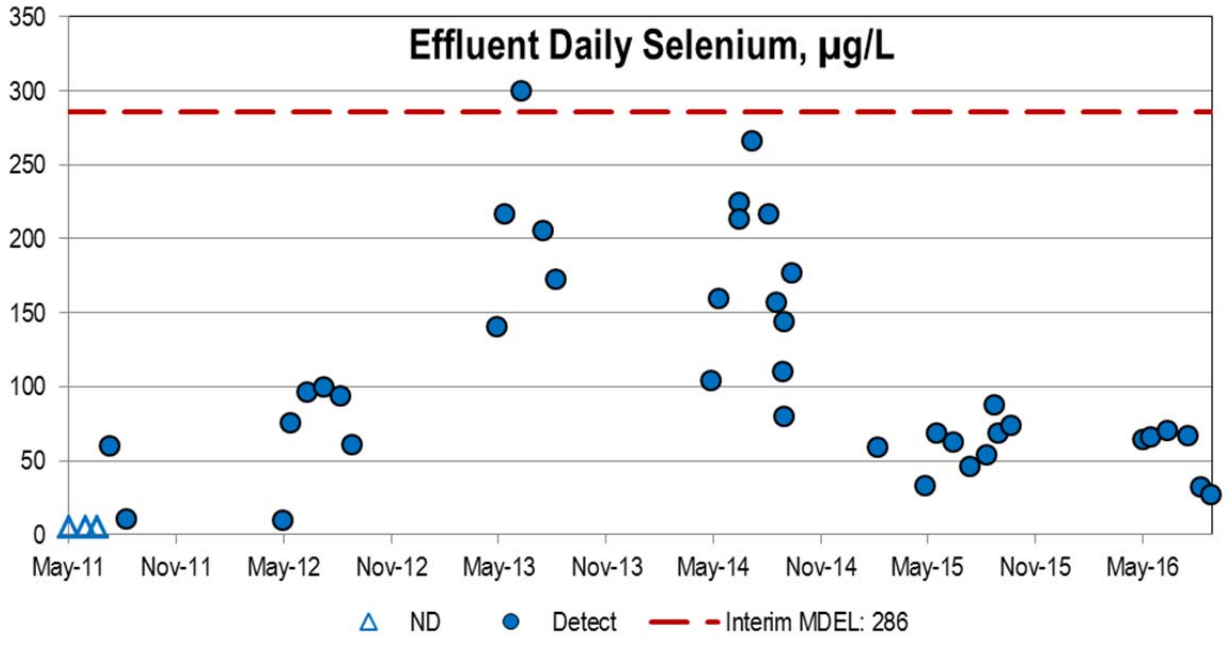
The unusually high value of 80 ug/L was removed from the dataset before performing the compliance assessment. Statistically, non-compliance is predicted with the interim monthly limit (statistical probability of 93.6%). The statistical probability with the interim daily limit is sufficient for compliance (99.9%).

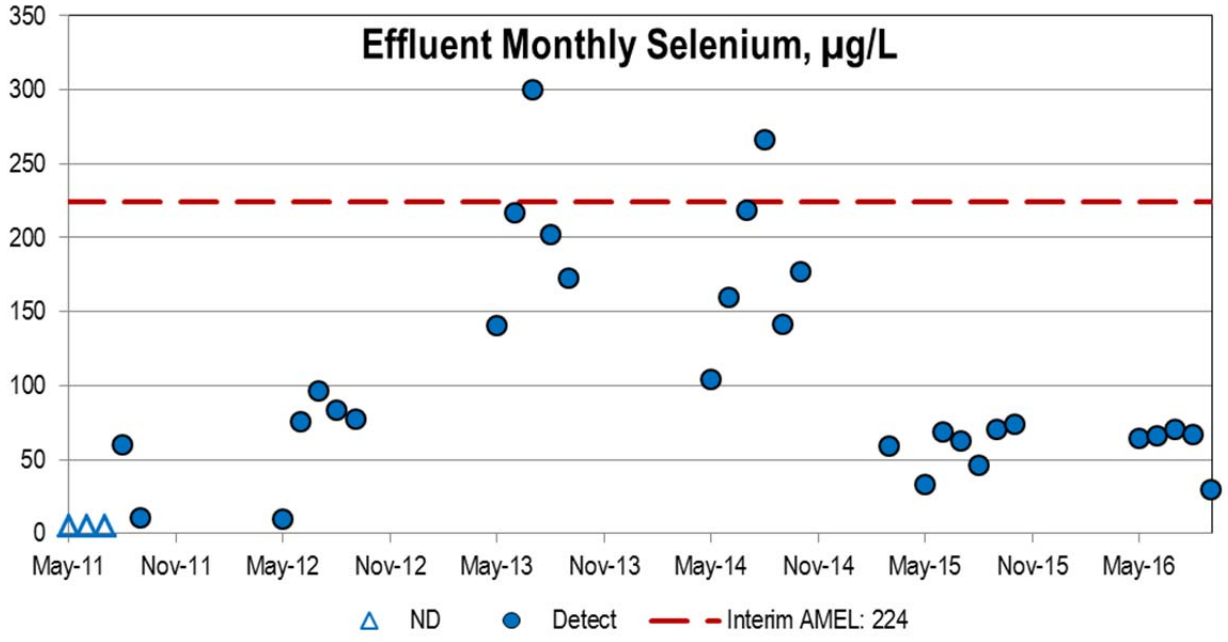




Selenium

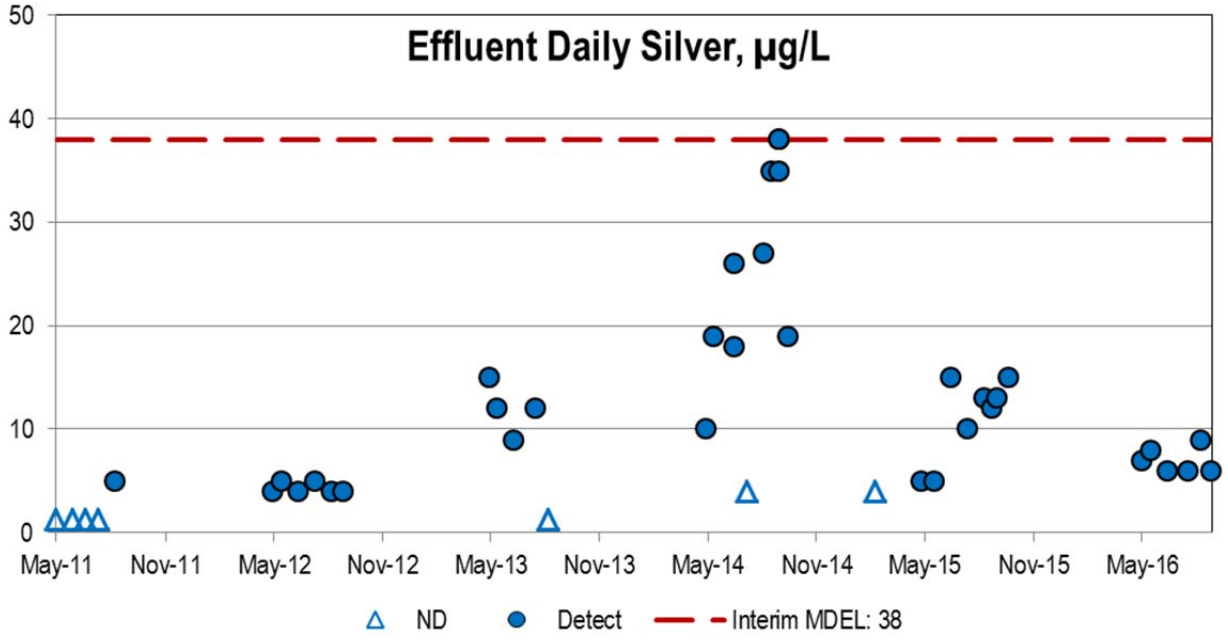
If the high concentrations observed between 2013-2014 are representative of effluent quality, the probability of compliance with these interim limits is not sufficient (88.0% AMEL, 93.0% MDEL). If concentrations reported after 2014 are representative of ongoing effluent quality, compliance with the interim limits is not expected to be a problem (the statistical probability of compliance with both limits is >99.91%).

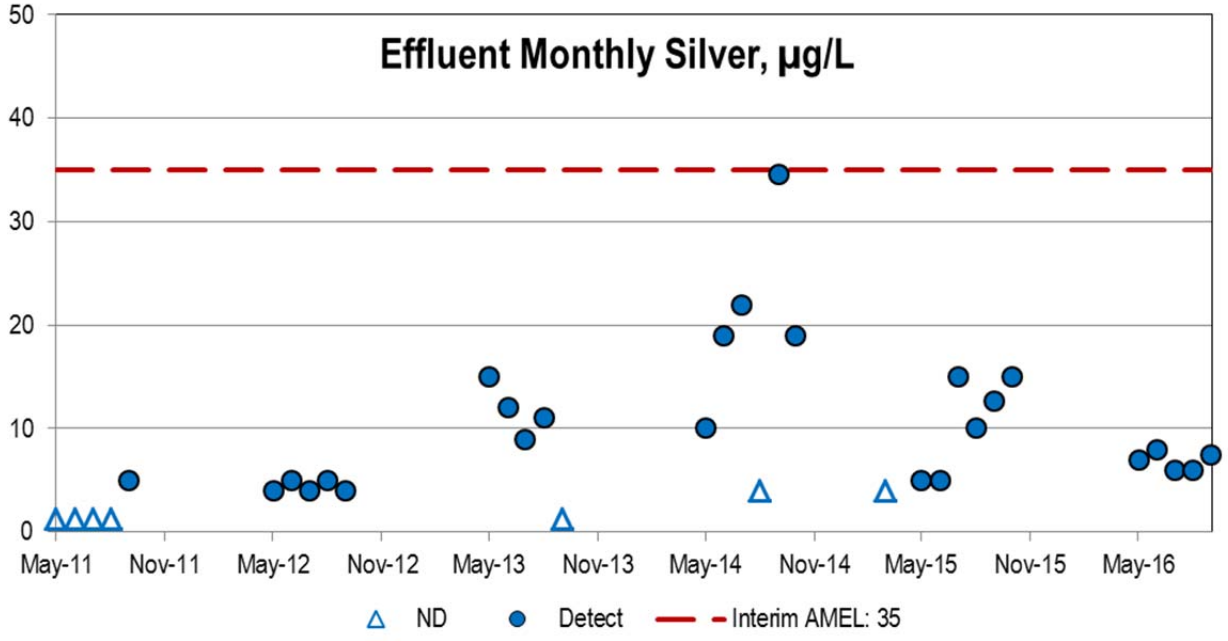




Silver

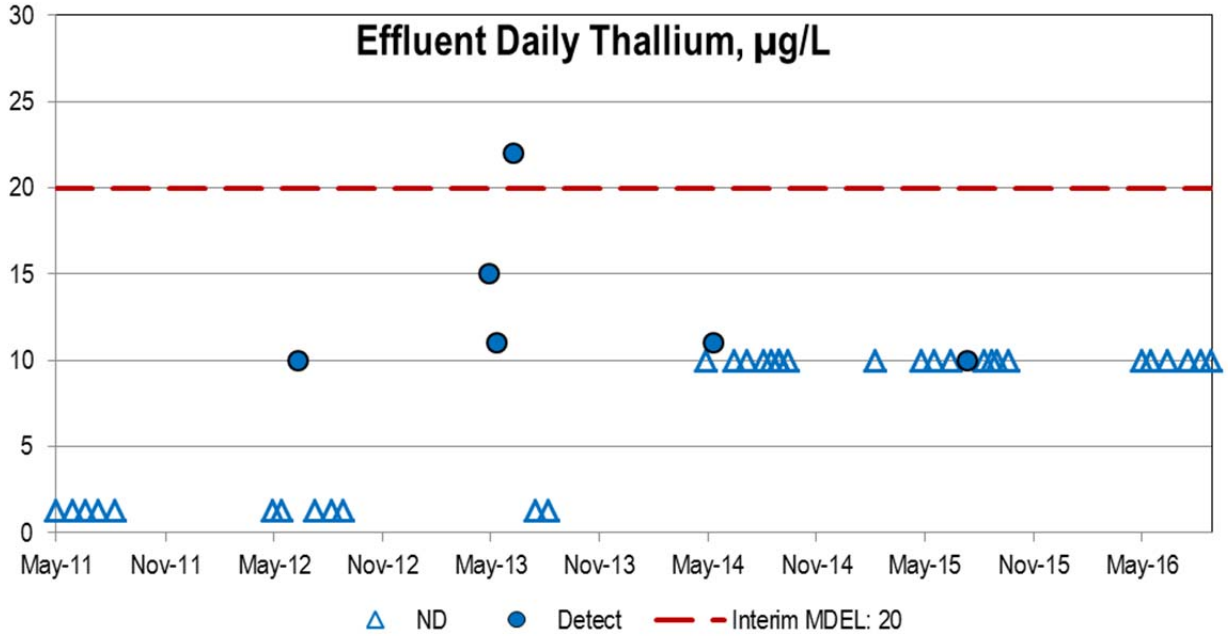
When the full dataset is used, the statistical probability of compliance with the interim limits is not sufficient (91.7% AMEL, 92.9% MDEL). If concentrations reported after 2014 are representative of ongoing effluent quality, compliance with the interim limits is not expected to be a problem (statistical probabilities are >99.9%).

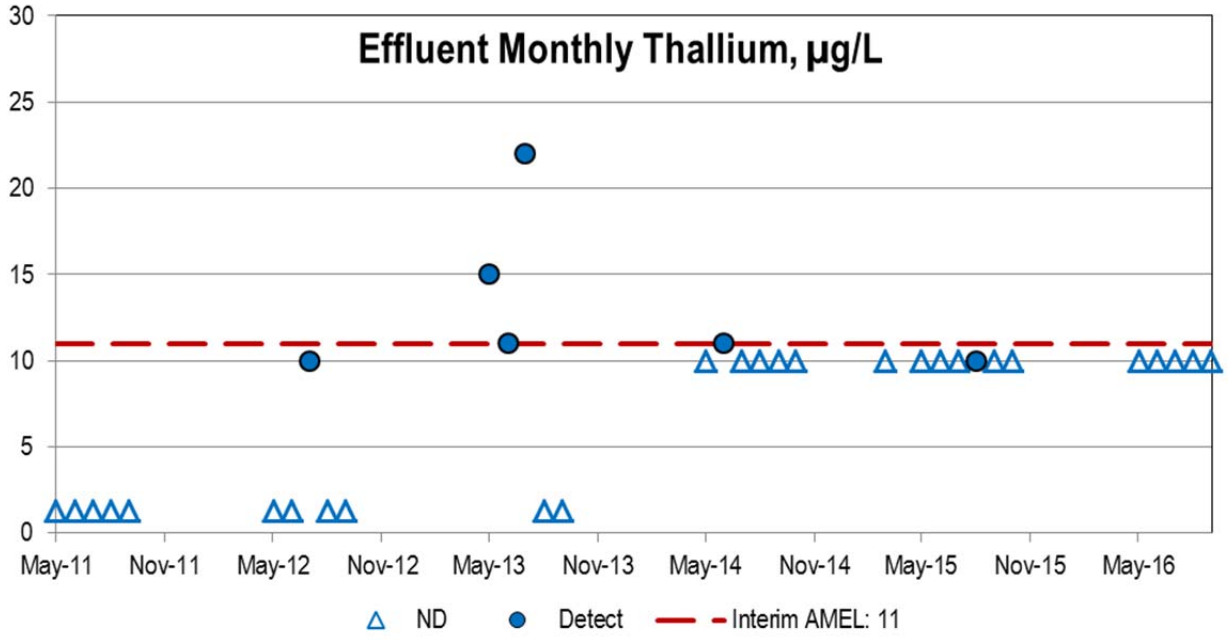




Thallium

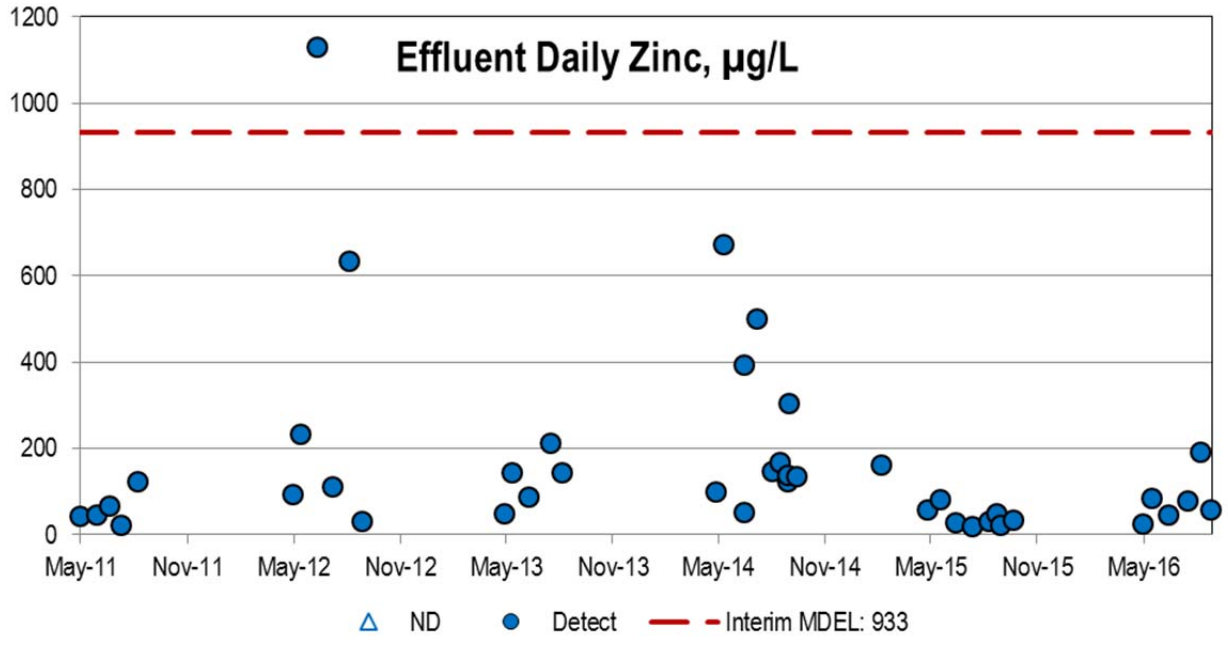
There are insufficient detected data to generate statistical compliance percentiles, however compliance with the interim monthly limit is dubious. The current reporting limit is 10 ug/L and effluent data have been detected above it in the past, therefore compliance with an interim limit of 11 µg/L may not be consistent. Compliance with the interim daily limit is not likely to be a problem

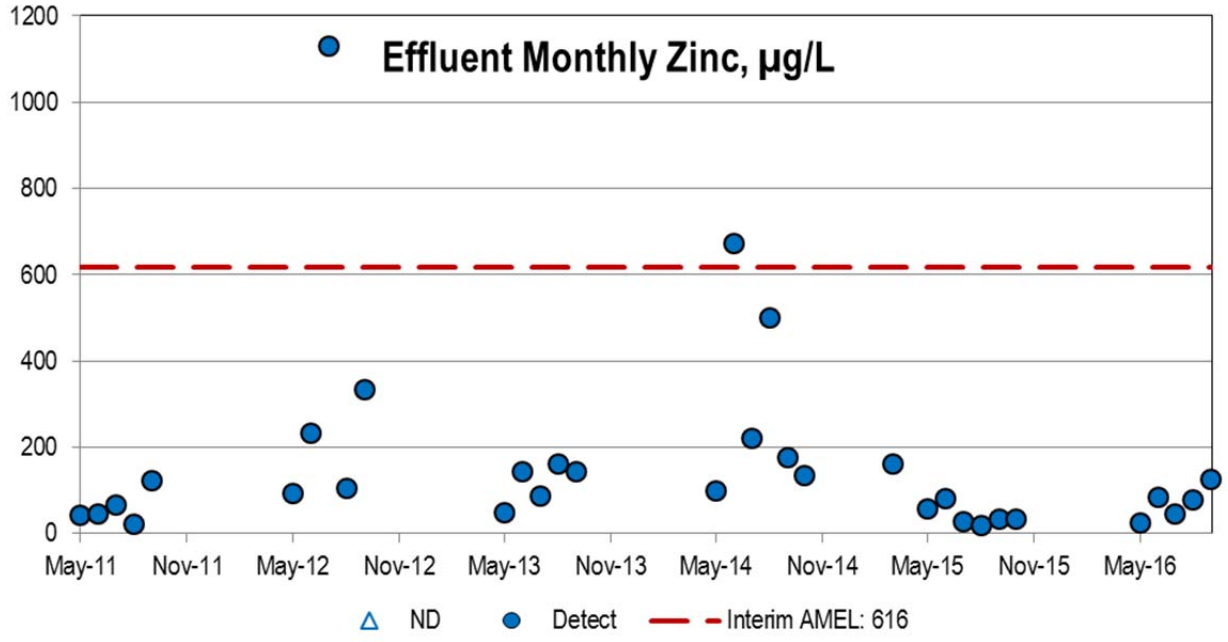




Zinc

If the high concentrations observed in 2012 and 2014 are representative of effluent quality, the probability of compliance with these interim limits is not sufficient (96.5% AMEL, 98.7% MDEL). If concentrations reported after 2014 are representative of ongoing effluent quality, compliance with the interim limits is not expected to be a problem (the statistical probability of compliance with both limits is >99.91%).





CONCLUSION

The tentative interim limits and compliance probabilities are shown in Table 1.

Table 1. Compliance Probabilities with Tentative Interim Limits

	Average Monthly			Maximum Daily		
	Interim Limit	Probability of Compliance (full dataset)	Probability of Compliance (data >2014)	Interim Limit	Probability of Compliance (full dataset)	Probability of Compliance (data >2014)
Copper	15	93.62%[a]	93.10%	58	99.90%[a]	--
Selenium	224	87.99%	100.00%	286	92.98%	100.00%
Silver	35	91.66%	99.91%	38	92.92%	99.95%
Thallium	11	--	--	20	--	--
Zinc	616	96.49%	99.94%	933	98.67%	99.99%

[a] The outlier 80 µg/L was removed from the dataset prior to analysis.

The analysis predicts that consistent compliance with the interim monthly limits for copper and thallium is unlikely. The probability of compliance with the other limits is satisfactory if concentrations reported after 2014 (from January 2015 onward) are representative of ongoing effluent quality.