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Water Resources
ENVIRONMENTAL QUALITY

Memorandum
To: NPDES Permit Writers
From: Julie Grzyb
Through: Jeff Poupart, Tom Belnick, and John Hennessy
Date: June 10, 2016
Subject: NPDES Permitting Guidance
NPDES Implementation of Instream Dissolved Metal Standards

This memorandum describes the procedure for determining whether a discharge has a reasonable potential to cause or contribute to an excursion above the newly adopted state water quality criteria for dissolved metals.

I. Recent Revisions to Surface Water Quality Standards

A. The NC 2007-2015 Water Quality Standard (WQS) Triennial Review was approved by the NC Environmental Management Commission (EMC) on November 13, 2014. The US EPA subsequently approved the WQS revisions on April 6, 2016 with some exceptions. For NPDES implementation purposes, the following changes are of most interest and are effective immediately:

1. Adoption of assorted dissolved metal standards (acute and chronic) for aquatic life protection (Table 1) and deletion of the corresponding 'total recoverable' metals standards for aquatic life (chronic). Some of the new standards are hardness-dependent. Use of the dissolved fraction of metal and the influence of hardness is considered more appropriate for evaluation of aquatic toxicity.
2. Adoption of 1Q10 streamflow dilution for NPDES implementation of acute water quality criteria. The period of this measure of low flow is a better match for acute effects of a metal.
3. Deletion of 'total recoverable' aquatic life criteria for chromium, iron, and manganese. The Cr-T standard is replaced by new standards for Cr-III and Cr-VI, and those for Fe and Mn are no longer considered necessary for protection of designated uses.
4. Rescission of Action Level Policy for copper, zinc, and silver. Effluent limits must now be added if there is positive reasonable potential, regardless of WET test results.

B. Table 1: NC Dissolved Metals Water Quality Criteria/Aquatic Life Protection

Parameter	Acute FW, ug/l (Dissolved)	Chronic FW, ug/l (Dissolved)	Acute SW, ug/l (Dissolved)	Chronic SW, ug/l (Dissolved)
Arsenic	340	150	69	36
Beryllium	65	6.5	---	---
Cadmium	Calculation	Calculation	40	8.8
Chromium III	Calculation	Calculation	---	---
Chromium VI	16	11	1100	50
Copper	Calculation	Calculation	4.8	3.1
Lead	Calculation	Calculation	210	8.1
Nickel	Calculation	Calculation	74	8.2
Silver	Calculation	0.06	1.9	0.1
Zinc	Calculation	Calculation	90	81

Table 1. Notes:

1. FW= Freshwater, SW= Saltwater
2. Calculation = Hardness dependent standard
3. Only the aquatic life standards listed above are expressed in dissolved form. Aquatic life standards for Mercury and selenium are still expressed as Total Recoverable Metals due to bioaccumulative concerns (as are all human health standards for all metals). It is still necessary to evaluate total recoverable aquatic life and human health standards listed in 15A NCAC 2B.0200 (e.g., arsenic at 10 ug/L for human health protection; cyanide at 5 ug/L and fluoride at 1.8 mg/L for aquatic life protection).

II. General Information on the RPA

This guidance assumes the reader has a working knowledge of the Division's current RPA process.

The RPA process itself will not change as the result of the new metals standards. However, application of the dissolved and hardness-dependent standards requires additional consideration in order to establish the numeric standard for each metal of concern of each individual discharge.

The hardness-based standards (noted by 'Calculation' in Table 1) require some knowledge of the effluent and instream (upstream) hardness and so must be calculated case-by-case for each discharge.

Metals limits must be expressed as 'total recoverable' metals in accordance with 40 CFR 122.45(c). The discharge-specific standards must be converted to the equivalent total values for use in the RPA calculations. We will generally rely on default translator values developed for each metal (more on that below), but it is also possible to consider case-specific translators developed in accordance with established methodology.

The RPA spreadsheet will automatically make all these calculations once the hardness data (effluent and upstream) and pertinent information are entered into the "Input Sheet.". As stated above, the RPA evaluation process is the same, however, it is important the permit writer understands the calculations and the significance of acquiring sufficient hardness data.

III. RPA for Hardness-dependent Metals - Freshwater

A. The RPA is designed to:

1. Predict the maximum likely effluent concentrations for each metal of concern, based on recent effluent data and
2. Calculate the allowable instream concentrations, based on applicable standards and the critical low-flow values for the receiving stream.

If the maximum predicted value is greater than the maximum allowed value (chronic or acute), the discharge has reasonable potential to exceed the standard, which warrants a permit limit in most cases.

If monitoring for a particular pollutant indicates that the pollutant is not present (i.e. consistently below detection level), then the Division may remove the monitoring requirement in the reissued permit.

B. To perform a RPA on the Freshwater hardness-dependent metals the Permit Writer should compile the following information:

1. Critical low flow of the receiving stream; 7Q10 (the spreadsheet automatically calculates the 1Q10 using the formula $1Q10 = 0.843\ (7Q10)^{0.993}$)
2. Effluent hardness and upstream hardness, site-specific data is preferred
3. Permitted flow
4. Receiving stream classification

C. In order to establish the numeric standard for each hardness-dependent metal of concern and for each individual discharge, the Permit Writer first determines what effluent and instream (upstream) hardness values to use in the equations.

1. Site-specific hardness data is best to evaluate chronic and acute concentrations. The permit writer should review DMR's, Effluent Pollutant Scans, and Toxicity Test results for any hardness data and contact the Permittee to see if any additional data is available.

   If no hardness data is available, the permit writer may choose to do an initial evaluation using a default hardness of 25 mg/L (CaCO3 or (Ca + Mg)) to see if the permittee is impacted.

   If the use of a default hardness value results in a hardness-dependent metal showing reasonable potential, the permit writer should contact the Permittee and request 5 site-specific effluent and upstream hardness samples over a period of one week. The permit writer should then rerun the RPA using the new data.

2. The overall hardness value to be used in the water quality equations will be calculated as follows:

   Combined Hardness (chronic)

   $$= \frac{\text{(Permitted Flow*Avg. Effluent Hardness) + (7Q10 S*Avg. Upstream Hardness)}}{\text{(Permitted flow + 7Q10 S)}}$$

   The Combined Hardness for acute is the same but the calculation uses the 1Q10 flow.

3. The RPA spreadsheet is designed so the permit writer can enter effluent hardness data and upstream hardness data in the RPA "Data Sheet." The spreadsheet will automatically calculate the average hardness of each data set and insert the averages into the flow-weighted mass balance equation identified above. The actual hardness values (effluent and upstream) should be entered even if the values are less than 25 mg/L (CaCO3 or (Ca + Mg)).

   The combined chronic and acute hardness values are then automatically inserted into the dissolved chronic and acute water quality standard equations. The combined hardness value will default to 25 if the value determined is less than 25 mg/L (CaCO3 or (Ca + Mg)). If no hardness data are available, a default value of 25 mg/L (CaCO3 or (Ca + Mg)) can be inserted in each data column for Effluent Hardness and Upstream Hardness.

   Minimum and maximum limits on the hardness value used for water quality calculations are 25 mg/L and 400 mg/L respectively.

   Note, stream dilution will always have a greater influence on the final permit limitations than hardness. Therefore, if the Permittee is showing reasonable potential to violate a standard and the Permittee discharges to a stream with a positive 7Q10 flow but has not received any credit for the dilution, the Permit writer should inform the Permittee that they can acquire credit for dilution by obtaining a low-flow estimate from USGS (i.e., mainly referring to WTPs that discharge to a positive 7Q10 stream but have not obtained a 7Q10 estimate from USGS). Lake discharges must perform a dilution model to receive credit for dilution.

D. The permit writer converts the numeric standard for each metal of concern to a total recoverable metal, using the EPA Default Partition Coefficients (DPCs) or site-specific translators, if any have been developed using federally approved methodology. These calculations are shown in the RPA spreadsheet under the sheet labeled "Dissolved to Total Metal Calculator."

EPA default partition coefficients or the "Fraction Dissolved" converts the value for dissolved metal at laboratory conditions to total recoverable metal at in-stream ambient conditions. This factor is calculated using the linear partition coefficients found in *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA 823-B-96-007, June 1996) and the equation:

$$\frac{C_{diss}}{C_{total}} = \frac{1}{1 + \{ [K_{po}] [ss^{(1+a)}] [10^{-6}] \}}$$

Where:
ss = in-stream suspended solids concentration [mg/L], minimum of 10 mg/L used, and
Kpo and *a* = constants that express the equilibrium relationship between dissolved and adsorbed forms of metals. A list of constants used for each hardness-dependent metal can also be found in the RPA program under a sheet labeled DPCs.

E. The numeric standard for each metal of concern is divided by the default partition coefficient (or site-specific translators) to obtain a Total Recoverable Metal at ambient conditions. The calculated Total Recoverable metals shown in the RPA sheet labeled "Dissolved to Total Metal Calculator" are automatically inserted into Table 2 of the RPA spreadsheet.

Dissolved criteria for metals that are not hardness-dependent are either divided by an EPA conversion factor to get a Total Recoverable metal or set equivalent to the Total Recoverable standard for each metal (i.e., Dissolved metal = Total Recoverable).[1] All standards (HH, WS), not hardness-dependent, are automatically shown in Table 2 of the RPA spreadsheet when the program is initiated.

F. The standards, criteria, and calculated Total Recoverable metal standards listed in Table 2 of the RPA spreadsheet are inserted into a mass balance equation to determine the total allowable concentration (permit limits) for each pollutant using the following equation:

$$Ca = \frac{(s7Q10 + Qw)(Cwqs) - (s7Q10)(Cb)}{Qw}$$

Where: Ca = allowable effluent concentration (µg/L or mg/L)
Cwqs = NC Water Quality Standard or federal criteria
Cb = background concentration (assume zero for all toxicants except NH_3)*
Qw = permitted effluent flow
S7Q10 = summer low flow used to protect aquatic life from chronic toxicity and human health through the consumption of water, fish, and shellfish from noncarcinogens

* Discussions are on-going with EPA on how best to address background concentrations

Flows other than S7Q10 may be incorporated as applicable:
1Q10 = used in the equation to protect aquatic life from acute toxicity
QA = used in the equation to protect human health through the consumption of water, fish, and shellfish from carcinogens
30Q2 = used in the equation to protect aesthetic quality

The total allowable concentration (permit limits) are shown on the "RPA Sheet" in the RPA spreadsheet.

1. Revised 7-25-16

Stream Classification Note:

On the RPA "Input Sheet", be sure to check the WS box on the left side of Table 1. located under "Stream Class" if the discharge is to a Water Supply stream. NC has a Water Supply hardness standard of 100 mg/L (CaCO3 or (Ca + Mg)) and if the Combined Hardness exceeds 100 mg/L the RPA will automatically reduce the value to 100 mg/L so the Permittee is not given credit for a higher hardness value than is allowed by the WQS's.

Do not check the WS box if the receiving stream is a WS-V in the B. Everett Jordan Reservoir or the Falls of the Neuse Reservoir watersheds. Those facilities are not subject to the WS standards for hardness per S.L. 2009-216 and S.L. 2009-486.

G. The permit writer complies effluent data for each pollutant of concern and enters it into the "Data Sheet." of the RPA spreadsheet. The RPA spreadsheet estimates the 95th percentile upper concentration of each pollutant. These concentrations are listed as the Predicted max concentrations on the "RPA Sheet" in the RPA spreadsheet. The Predicted Max concentrations are compared to the Total allowable concentrations to determine if a permit limit is necessary. If the predicted max exceeds the acute or chronic Total allowable concentrations, the discharge is considered to show reasonable potential to violate the water quality standard, and a permit limit (Total allowable concentration) is included in the permit in accordance with the U.S. EPA Technical Support Document for Water Quality-Based Toxics Control published in 1991.

IV. Monitoring Requirements for Hardness -Freshwater

A. To build a more robust hardness dataset, all Municipal and Industrial Permittees, with a discharge to freshwater, required to sample for hardness-dependent metals shall get quarterly monitoring requirements for effluent hardness and instream hardness, upstream of the discharge. All Pretreatment POTWs sampling for hardness-dependent metals (as part of their Pretreatment LTMP/STMP or as a permit requirement) shall get quarterly monitoring requirements for effluent hardness and instream hardness, upstream of the discharge.

Exception, if the Permittee has a zero – low flow (7Q10), upstream hardness sampling is not necessary.

A list of all Pretreatment POTWs sampling for metals will be distributed to all Permit Writers. It is recommended that instream hardness samples be taken 50 to 100 feet upstream of the discharge or at the nearest sampling location upstream of the discharge. The samples shall be representative of the hardness in the receiving stream. The sample type for effluent hardness should be a composite (24 hour preferred for WWTPs) if the Permittee takes composite samples for other parameters. Otherwise, it can be a grab.

An example Effluent sheet with hardness sampling requirements has been added at the end of this memo as Attachment #1. Note, footnotes 2, 5, and 6 were adjusted so the Permittee understands that the instream hardness sampling requirement is not provisionally waived as a member of any Monitoring Coalition. Monitoring Coalitions are currently not sampling for hardness – this may change over time. See Section XI of this memo for more details on this issue.

V. Limits and Monitoring Requirements for Hardness-Dependent Metals – Freshwater & Saltwater

The Clean Water Act requires that state-issued NPDES permits include effluent limits as stringent as necessary to meet water quality standards. The following sections describe how various outcomes of the RPAs affect effluent limits and other permit conditions.

A. RP Exists – no previous chronic or acute limitations

If the current permit does not have metal limitations and limitations are required based on the new hardness-dependent water quality standards – add the limits to the permit with a monitoring frequency of monthly as required by the July 15, 2010 memo on *Monitoring Frequency for Toxic Substances.* Effluent hardness and instream hardness sampling, upstream of the discharge, should be added at a quarterly frequency with a footnote to sample in conjunction with effluent metals sampling. The limits should be effective immediately, unless a compliance schedule is deemed appropriate (see paragraph G below).

B. RP Exists – previous chronic WQBEL is less stringent

If the new hardness-dependent chronic metal limitation is more stringent than the previous WQBEL in the existing permit – add the new hardness-dependent chronic and acute metal limitations to the permit with a monitoring frequency of monthly as required by the July 15, 2010 memo on *Monitoring Frequency for Toxic Substances*. In addition, add effluent hardness and instream hardness sampling, upstream of the discharge, at a quarterly frequency with a footnote to sample in conjunction with effluent metals sampling. The limits should be effective immediately, unless a compliance schedule is deemed appropriate (see paragraph G below). If a Compliance Schedule is necessary, it is recommended that the permit writer leave the previous WQBELs in the permit as interim limits.

C. RP Exists –Technology Based Effluent Limitation (TBEL) is less stringent

If the new hardness dependent metal WQBEL is more stringent than the TBEL in the existing permit – add the new hardness-dependent metal limitations to the permit with a monitoring frequency of monthly as required by the July 15, 2010 memo on Monitoring Frequency for Toxic Substances. In addition, add effluent hardness and instream hardness sampling, upstream of the discharge, at a quarterly frequency with a footnote to sample in conjunction with effluent metals sampling. The limits should be effective immediately, unless a compliance schedule is deemed appropriate (see paragraph G below). If a Compliance Schedule is necessary, it is recommended, that the permit writer leave the TBEL (existing or recalculated for the renewal) in the permit as an interim limitation, assuming the Permittee can comply with the TBEL.

D. RP Exists – previous limitation(s) more stringent

If the new hardness-dependent metal WQBEL is showing RP but is less stringent than the previous WQBEL which were based on Total metal standards - remove the previous limit(s) and add the new metal limits at the same frequency. Effluent hardness and instream hardness sampling, upstream of the discharge, should be added at a quarterly frequency with a footnote to sample in conjunction with effluent metals sampling. The new hardness-dependent metal limits should be effective immediately, unless an existing compliance schedule in the permit is deemed appropriate or requires modification.

E. RP Exists – limited data set (n < 9)

If the Effluent Pollutant Scan data or other limited effluent data shows reasonable potential for a hardness-dependent metal to exceed a hardness-dependent WQBEL (limited data, n < 9), add monitoring for the metal of concern, at a frequency of quarterly. Effluent hardness and instream hardness sampling, upstream of the discharge, should be added at a quarterly frequency with a footnote to sample in conjunction with effluent metals sampling. No metal limitations will be required at this time due to a limited data set.

However, if 2 or more reported values are greater than the Total allowable concentration, add permit limits for the hardness-dependent metal and monthly monitoring. For cadmium and silver read the guidance in Sections VII and VIII before adding a limitation. In addition, add effluent hardness and upstream hardness sampling at a frequency of quarterly along with a footnote to sample in conjunction with effluent metals sampling. The new hardness-dependent metal limits should be effective immediately, unless a compliance schedule is deemed appropriate (see paragraph G below).

F. No RP (Predicted Max ≥ 50% of Allowable)

If the hardness dependent metal is not showing reasonable potential but the predicted max is > 50% of the allowable concentration - add quarterly monitoring for the metal of concern. In addition, add effluent hardness and instream hardness sampling, upstream of the discharge, at a quarterly frequency with a footnote to sample in conjunction with effluent metals sampling. In accordance with RPA procedures, metal sampling can be deferred to the Pretreatment LTMP/STMP but **hardness sampling must be included in the permit** even if the metal sampling requirement is deferred to the Pretreatment Program.

G. No RP (Predicted Max < 50% of Allowable)

If the hardness dependent metal is not showing reasonable potential and the predicted max is < 50% of the allowable concentration – no monitoring or effluent limitations are required. However, as discussed in Section IV, all Pretreatment POTWs sampling for hardness-dependent metals (as part of their Pretreatment LTMP or STMP) shall get quarterly monitoring requirements for effluent hardness and instream hardness, upstream of the discharge, unless the Permittee has a zero low flow 7Q10, then upstream hardness sampling is not necessary.

H. Compliance Schedules:

Sometimes a permittee cannot immediately comply with new or newly applied Water Quality-Based Effluent Limits (WQBELs) upon the effective date of the permit because the permittee needs time to consider its situation and evaluate its options, such as implementing source controls or making substantial modifications to its facility or processes in order to meet the new limits. Depending upon the circumstances, NPDES permits may include a series of required steps and deadlines (i.e., a compliance schedule), which upon completion, enables the permittee to meet the permit's water quality-based effluent limits (see 40 CFR § 122.47). If this is the case, be sure to add a footnote by the new WQBEL giving an effective date of YY years after the permit becomes effective (XXXX) and reference the addition of Section A.(X.). Compliance Schedule for Hardness Dependent Metals. Each permit writer will be responsible for developing a compliance schedule specific to each Permittee's circumstances keeping in mind that a particular compliance schedule requires compliance with the WQBEL "as soon as possible." See Section X for more details on Compliance Schedules.

VI. Chromium

To protect aquatic life, the 2007-2014 Triennial Review rules included numeric criteria for chromium VI in freshwater and saltwater and a hardness-dependent standard for chromium III in freshwater. The standard for Total Chromium was removed.

Parameter	Acute FW, ug/l (Dissolved)	Chronic FW, ug/l (Dissolved)	Acute SW, ug/l (Dissolved)	Chronic SW, ug/l (Dissolved)
Chromium III	Calculation	Calculation	---	---
Chromium VI	16	11	1100	50

A. Key Issues:

Laboratories typically report chromium as total chromium, unless analysis for chromium VI is requested.

Total chromium consists primarily of trivalent (III) and hexavalent (VI) forms. Hexavalent forms which are generally produced by industrial sources are considered to be more toxic than trivalent forms which typically come from natural sources (ATSDR. Toxicological Profile for Chromium. See: http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=62&tid=17)

In the situation where only total chromium effluent data are available, results are compared to the most stringent applicable standard for either chromium III or chromium VI. In this particular case, chromium VI will be the most stringent standard in either freshwater or saltwater environments. This is conservative and represents toxicity based on chromium VI criteria when the water sample may be primarily comprised of chromium III.

Chromium III and VI are not currently listed in Appendices D or J of 40 CFR 122 and are not required as part of the federally mandated priority pollutant scan.

B. Recommended Analytical Method:

The recommended analytical method for total chromium is EPA Method 200.8. The recommended analytical method for chromium VI is EPA Method SM3500-Cr B-2009. There is no recognized analytical method for chromium III; therefore, chromium III should be determined from the calculated difference of chromium VI from total chromium.

Chromium VI is sampled in the dissolved form and has a Practical Quantitation Limit (PQL) of 50 ug/L. Total Chromium can be sampled as a total recoverable metal and has a PQL of 10 ug/L.

C. Implementation Instructions:

As a cost savings measure, total recoverable chromium data results may be used as a conservative surrogate in cases where there are no analytical results based on chromium III or VI. **Permittees with total chromium effluent samples showing no reasonable potential to exceed either the chromium VI or the chromium III total allowable concentrations (permit limits) do not need to continue to monitor for total chromium unless it is required by federal categorical regulations or as part of their Pretreatment LTMP/STMP.**

The total allowable concentrations (permit limits) for chromium III and chromium VI will be listed in the RPA sheet after the appropriate input data is entered. Since chromium III and VI now have state water quality standards, in the event the projected maximum concentration for total chromium exceeds the standard for either chromium III or chromium VI, limits and monitoring should be considered using the following guidance.

1. In the event where monitoring for chromium VI is indicated (total chromium projected max is greater than the total allowable chromium VI permit limit), staff have the following options:
   a) Add limitations and monitoring for chromium VI.
   b) Require monitoring and analysis of total chromium in lieu of chromium VI. The permit writer may choose this option when there is no chromium VI TBEL requirement for this facility and:

(1) All total chromium effluent samples are consistently below the detection level for chromium VI (50 ug/L).

(2) The Permittee has documented that chromium VI is not present* in the wastewaters discharged. If total chromium is being reported at concentrations ≥ 50 ug/L the permittee should supply dissolved chromium VI sample results to support this claim.

* Generally, a pollutant is "known" to be present in the effluent due to factors such as source water contamination, industrial sources within the collection area, listing status of the receiving water body, or inclusion in a pretreatment program.

2. In the event where monitoring for chromium III is indicated (total chromium projected max is greater than the total allowable chromium III), staff have the following option:
   a) Add limitations for Cr III and Cr VI and under **Sample Type** put "Calculate" for chromium III. This will require the determination of the concentrations for total chromium and chromium VI. The difference between these two values will be assumed as the concentration of chromium III and will then be used for determining reasonable potential and compliance with WQBELs already introduced. A footnote stating Cr III = Total Cr – Cr VI should be added to the Cr III limitation.

VII. Cadmium

A. Given the new WQS for cadmium, it is likely that the RPA may determine a cadmium chronic permit limit less than 1.0 µg/L for Permittees without much dilution. It is important that these Permittees show that they are reporting cadmium down to the PQL (recognized as 0.5 µg/L in March 2013 by DWR). Since not all Permittees are monitoring cadmium down to the lower PQL, look at the Permittee's "cadmium effluent data" and consider the following guidance:

1. For Permittees reporting cadmium effluent values at levels < 0.05 µg/L for the past year and < 1 µg/L for previous years, the permit writer can consider this representative of all non-detects. No limits or monitoring for cadmium required.
2. For Permittees reporting cadmium effluent values at levels < 1 µg/L or < 2 µg/L for the past several years, add or maintain quarterly monitoring but do not require an effluent limit, and require that the Permittee have the lab test to the lower reporting level.
3. For Permittees reporting one or two cadmium effluent values as 1 µg/L instead of < 1 (and possibly 2 µg/L instead of < 2 before 2013), add or maintain quarterly monitoring, and require that the Permittee have the lab test to the lower reporting level. State in the cover letter and fact sheet that the Permittee should review and implement clean sampling techniques and spilt cadmium samples with another lab. If hits continue, the Permittee should look at SIU's or perform a collection system survey to look for possible sources. State that a limit will be put in the permit during the next permit renewal if effluent levels show reasonable potential or exceed the Total allowable concentration of xx.

VIII. Silver

EPA disapproved the Action Level policy for permitting silver. It is important that the Permittee show that they are reporting silver down to the PQL (recognized as 1 µg/L in March 2013 by DWR) unless the current reporting detection level demonstrates that the facility's discharge is less than the total allowable concentration (permit limit). Note that the PQL for silver was 5 µg/L prior to 2013.

A. Given the aquatic life silver chronic standard of 0.06 µg/L, the best most Permittees can do is demonstrate that the facility's discharge is less than the PQL. In general, a Permittee requiring a limitation for silver will clearly show reasonable potential (i.e., effluent samples > 5 µg/L). Look at the Permittee's "silver effluent data" and consider the following guidance:

1. For Permittees reporting silver effluent values at levels < 1 µg/L for the past year and

< 5 µg/L for previous years, the permit writer can consider this representative of all non-detects. No limits or monitoring for silver required.

2. For Permittees reporting silver effluent values at levels < 5 µg/L for the past several years, do not require an effluent limit but add or maintain quarterly monitoring and require that the Permittee have the lab test to the lower PQL level.
3. For Permittees reporting one or two low silver effluent values as a positive detection (e.g., 1 instead of < 1 ug/L), add or maintain quarterly monitoring and require that the Permittee have the lab test to the lower reporting level. State in the cover letter and fact sheet that the Permittee should review and implement clean sampling techniques and spilt silver samples with another lab. If hits continue the Permittee should look at SIU's or perform a collection system survey to look for possible sources. State that a permit limit will be put in the permit during the next permit renewal if effluent levels show reasonable potential or exceed the Total allowable concentration of xx.

IX. Zinc

The hardness-dependent water quality standard for zinc typically results in a more stringent permit limit for the acute total allowable metal verses the chronic. In this situation, use the acute total allowable metal concentration (permit limit) as the limitation for the Daily Maximum and the Monthly Average.

X. Compliance Schedules

Before writing a Compliance Schedule please review the EPA Headquarters Memo dated May 10, 2007 from James Hanlon to Alexis Strauss on 40 CFR 122.47 Compliance Schedule Requirements. Some important things to note from the memo –

Factors relevant to a conclusion that a particular compliance schedule requires compliance with the WQBEL "as soon as possible," as required by 40 CFR 122.47(a)(1) include: consideration of the steps needed to modify or install treatment facilities, operations or other measures and the time those steps would take. The permitting authority should not simply presume that a compliance schedule be based on the maximum time period allowed by a State's authorizing provision.

Compliance Schedules that are longer than one year in duration must set forth interim requirements and dates for their achievement. 40 CFR 122.47 (a)(3).

Any Compliance schedule contained in an NPDES permit must include an enforceable final effluent limitation and a date for its achievement that is within the timeframe allowed by the applicable State or federal law provision authorizing compliance schedules as required by CWA sections 301(b)(1)(C)….and EPA regulations at 40 CFR 122.2, 122.44(d) and 122.44(d)(1)(vii)(A).

Therefore, permits must contain annual milestones and a final date to comply with the WQBEL. If it is clear the Permittee will need to seek source reduction from SIU's or install equipment at the WWTP to meet limits the permit writer should work with the Permittee to develop an appropriate schedule that considers the relevant factors.

Milestones can be such things as – Identify sources of the pollutant, perform a collection system sewer survey, evaluate source reduction alternatives, submit a Corrective Action Plan (i.e. Improving treatment at the WWTP or moving the discharge to a larger stream), perform a dilution study, or issue revised permits to SIU's to enforce limits and achieve compliance with the limitation(s), etc…

Some Permittee's may opt to perform a Water Effects Ratio (WER) study. This should not be part of the compliance schedule. If they choose to do a WER, the Permittee should first submit the WER study plan to DWR for approval. Once the Permittee receives approval from DWR on the WER study, the Permittee can proceed. The WER study itself, may take about 18 months. The Permittee is responsible for submitting the results to DWR and requesting a permit modification based on the findings. Note, a WER study has to be re-evaluated and reconfirmed every five years.

XI. Waivers for Members of Monitoring Coalitions

The Monitoring Coalitions are currently not sampling for instream metals or instream hardness. However, if this should change and the Permittee insists on having the Monitoring Coalition perform its instream hardness sampling, upstream of its discharge, insert the following footnote in the Effluent Limitations and Monitoring Requirements sheet with the upstream hardness monitoring requirement.

1. The Permittee shall sample instream hardness, upstream of the facility's discharge. The sample shall be representative of the hardness in the receiving stream.

   If the Permittee is a member of the Monitoring Coalition Program, sampling for instream hardness may be waived as long as the Monitoring Coalition agrees to sample hardness at the nearest upstream location, at a minimum frequency of quarterly, and the Permittee has obtained approval from DWR - NPDES Permitting Unit that the upstream station being monitored by the Coalition is representative of the receiving stream for this discharge. The Permittee is responsible for submitting instream hardness test results with its DMRs as results are received from the Coalition.

   If Coalition membership is cancelled or the Monitoring Coalition terminates instream hardness sampling at the approved station, the Permittee will immediately notify the Division and resume sampling for instream hardness, upstream of its discharge, as required in Section A.(X.).

This will have to be a separate footnote from the provisional waiver for other parameters such as temperature, dissolved oxygen, fecal coliform, and conductivity.

XII. Pretreatment POTWs and the need for a revised Headworks Analysis

Given the new WQSs, Pretreatment POTWs will be required to revise their Headworks Analysis to account for the changes in maximum metal loadings to the POTW. In order to make these calculations, the Pretreatment Unit will need a final copy of the permit along with a copy of the "RPA Sheet" and the "Dissolved to Total Metal Calculator Sheet" contained in the final RPA spreadsheet for each Pretreatment Permittee. If the POTW has multiple flows, supply Sheets for each scenario.

Items discussed at Nov. 14, 2016 Combined Staff Meeting

Permit Writers:
Thought it would be best to summarize the main points I discussed at Monday's Combined Meeting:

1. There is no longer a need for the footnote – Metal samples should be taken in conjunction with toxicity tests.
   My understanding is that the Aquatic Toxicity Branch wanted this performed to see if toxicity test failures could be associated with high levels of copper or zinc. Since the action level policy no longer applies to the implementation of copper, zinc or silver water quality stds., there is no need for this footnote. We can re-evaluate this decision should any concerns arise.

2. The following footnote should be added to permits with "effluent" hardness sampling requirements – "Effluent hardness sampling should be performed in conjunction with testing for hardness dependent metals (cadmium, copper, lead, nickel, silver, and zinc)."

3. The original footnote on "upstream" hardness sampling suggested in Attachment #1 of the **NPDES Implementation of Instream Dissolved Metal Standards** Guidance, dated June 10, 2016, should be deleted (Instream monitoring for hardness is not provisionally waived if the Permittee is a member of a Monitoring Coalition - do not use). Instead, for all Coalition members, use the footnote suggested in Section XI of the Guidance as follows:

   > The Permittee shall sample instream hardness, upstream of the facility's discharge. The sample shall be representative of the hardness in the receiving stream. If the Permittee is a member of the Monitoring Coalition Program, sampling for instream hardness may be waived as long as the Monitoring Coalition agrees to sample hardness at the nearest upstream location, at a minimum frequency of quarterly, and the Permittee has obtained approval from DWR - NPDES Permitting Unit that the upstream station being monitored by the Coalition is representative of the receiving stream for this discharge. The Permittee is responsible for submitting instream hardness test results with its permit renewal application package. If Coalition membership is cancelled or the Coalition terminates instream hardness sampling at the approved station, the Permittee will immediately notify the Division and resume sampling for instream hardness, upstream of its discharge.

   A revised Attachment #1 is attached to this email. This footnote will give Coalition Permittees the option to work with their Coalition Monitoring Assoc. should the Coalition choose to perform instream hardness sampling for their members.

Thanks,

Julie A Grzyb

Attachment #1(revised 11/17/16)

PART I

A. (1.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (4.0 MGD)

[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until the expiration, the Permittee is authorized to discharge treated wastewater from outfall 001. Such discharges shall be limited and **monitored**[1] by the permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS			MONITORING REQUIREMENTS		
	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location[2]
Flow	4.0 MGD			Continuous	Recording	I or E
BOD, 5-day, 20º C [3] (April 1-October 31)	17.0 mg/L	25.5 mg/L		Daily	Composite	I, E
BOD, 5-day, 20º C [3] (November 1-March 31)	27.0 mg/L	40.5 mg/L		Daily	Composite	I, E
Total Suspended Solids [3]	30.0 mg/L	45.0 mg/L		Daily	Composite	I, E
NH_3 as N (April 1 – October 31)	2.0 mg/L	6.0 mg/L		Daily	Composite	E
NH_3 as N (November 1 – March 31)	5.0 mg/L	15.0 mg/L		Daily	Composite	E
Fecal Coliform (geometric mean)	200/100 ml	400/100ml		Daily	Grab	E
Total Residual Chlorine [4]			28 µg/L	Daily	Grab	E
Dissolved Oxygen			≥ 5 mg/L	Daily	Grab	E,U,D[2]
PH	> 6.0 S.U. and < 9.0 S.U.			Daily	Grab	E
Temperature (ºC)				Daily	Grab	E,U,D[2]
Total Nitrogen (NO_2+NO_3+TKN)(mg/L)				Monthly	Composite	E
Total Phosphorus(mg/L)				Monthly	Composite	E
Conductivity (µS/cm)				Daily	Grab	E,U,D[2]
Fecal Coliform (geometric mean)				Footnote 2	Grab	U,D[2]
Hardness –Total as [$CaCO_3$ or (Ca + Mg)] [5] (mg/L)				Quarterly	Composite	E
Hardness –Total as [$CaCO_3$ or (Ca + Mg)] [6] (mg/L)				Quarterly	Grab	U
Total Copper[5] (µg/L)				Quarterly	Composite	E
Chronic Toxicity [7]				Quarterly	Composite	E
Effluent Pollutant Scan [8]	Monitor and report			Footnote 8	Footnote 8	E

Footnotes:

1. Starting on December 21, 2016, begin submitting discharge monitoring reports electronically using NC DWR's eDMR application system. See Special Condition A.(6.).
2. Sample locations: I-Influent, E-Effluent, U-Upstream at NCSR 2316; D-Downstream approximately 0.5 miles downstream from the outfall. Instream samples shall be grab samples collected ***3/Week*** during the months of June, July, August, and September and ***Weekly*** during the remainder of the year. **Instream monitoring for DO, temperature, conductivity, and fecal coliform is provisionally waived in light of the permittee's participation in the Yadkin-Pee Dee River Basin Association. Instream monitoring will be immediately reinstated and the Division shall be notified immediately should the permittee end its participation in the Association.**
3. The monthly average effluent BOD_5 and Total Suspended Solids concentrations shall not exceed 15 percent of the respective monthly average influent value (85% removal).
4. The Division shall consider all effluent total residual chlorine values reported below 50 ug/l to be in compliance with the permit. However, the permittee shall continue to record and submit all values reported by a North Carolina certified laboratory (including field certified), even if these values fall below 50 ug/l.

5. Effluent hardness sampling should be performed in conjunction with testing for hardness dependent metals (cadmium, copper, lead, nickel, silver, and zinc).

6. The Permittee shall sample instream hardness, upstream of the facility's discharge. The sample shall be representative of the hardness in the receiving stream. If the Permittee is a member of the Monitoring Coalition Program, sampling for instream hardness may be waived as long as the Monitoring Coalition agrees to sample hardness at the nearest upstream location, at a minimum frequency of quarterly, and the Permittee has obtained approval from DWR - NPDES Permitting Unit that the upstream station being monitored by the Coalition is representative of the receiving stream for this discharge. The Permittee is responsible for submitting instream hardness test results with its permit renewal application package. If Coalition membership is cancelled or the Coalition terminates instream hardness sampling at the approved station, the Permittee will immediately notify the Division and resume sampling for instream hardness, upstream of its discharge.

7. Chronic Toxicity (*Ceriodaphnia dubia*) P/F at 45%: January, April, July, and October (see Part I, A. (3.)).

8. See Condition A. (4.) of this permit.

There shall be no discharge of floating solids or visible foam in other than trace amounts.