Update to Copper Criteria for Aquatic Life

Rule Docket No. 58-0102-1502

July 18, 2017

Outline

- Review of Comments Received
- Review of Preliminary draft rule
- Review of Statewide Monitoring report changes
- Review of Guidance changes
- Discussion
- Next Steps

Comments Received

- NMFS (6/1/2017)
- Clearwater Paper
- EPA

NMFS

- Protection of “Most Bioavailable Conditions”
  - Criteria protective at all times
  - Determine when and where most bioavailable conditions occur
  - Ensuring representative data are collected

NMFS

- Identifying applicable criteria
  - When to use minimum vs. low percentile of IWQCs
  - What specific percentile of IWQC
- Estimating criteria
  - Estimating input parameters
  - Concern about effects of discharges on estimates (downstream samples)

NMFS

- Preference for continuous pH data, characterize diurnal variability of pH, require use of daily minimum pH values

Clearwater Paper

- Blank Correction

EPA

- Procedures and default criteria should be in rule- legally binding
- Update data and figures to 2014 IR
- Suggest removing values from table

EPA

- 210.03.c.v.1.b – clarify that BLM forms basis of estimates

v. Copper Criteria for Aquatic Life.

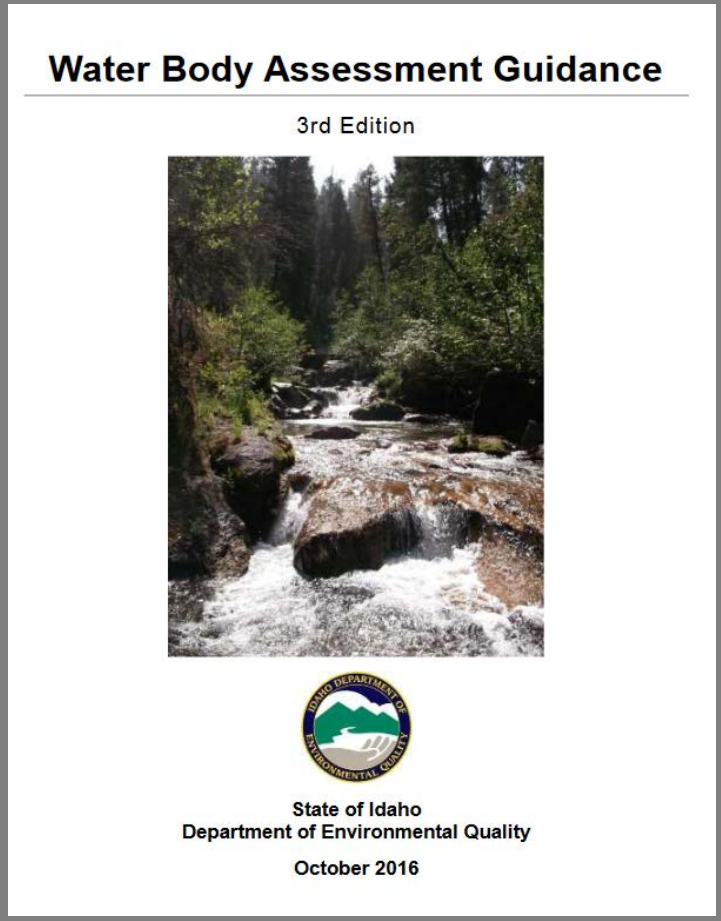
(1) Aquatic life criteria for copper shall be derived using:

(a) Biotic Ligand Model (BLM) software that calculates criteria consistent with the "Aquatic Life Ambient Freshwater Quality Criteria – Copper": EPA-822-R-07-001 (February 2007), available at www.deq.idaho.gov/58-0102-1502; or

(b) An estimate that is based on a scientifically sound method and protective of the designated aquatic life use.

EPA

- Spatial Representation – Downstream or Upstream
- How will DEQ determine if an AU is representative, what is the extent of an AU, and what rationale will DEQ provide if data are considered not representative?



EPA

- EPA recommends methods for deriving default inputs and use of draft missing parameters document
- Inconsistency with this guidance and ELDG – no specific instructions for developing permit limits

EPA

- Recommend analysis to determine error rate of our conservative criteria
- Inclusion of all available data - USGS
- Concerns about use of single-sample results to determine conservative criteria

Draft Rule

- Change 210.03.c.v.1.b –
- (b) An estimate *derived from BLM outputs* that is based on a scientifically sound method and protective of the designated aquatic life use

DRAFT
Statewide Monitoring for Inputs to the Copper Biotic Ligand Model

State of Idaho
Department of Environmental Quality

~~June~~ DRAFT July 2017

Effect of Discharges on Criteria Estimates

$$\boldsymbol{Percent\ Difference}\ (\%) = \frac{(C_D - C_U)}{(C_D + C_U)/2} \times 100$$

- Where: C_D = chronic BLM criteria from downstream sample (µg/L)
- C_U = chronic BLM criteria from upstream sample (µg/L)

53% of downstream locations had higher criteria than the upstream location…

87% of downstream locations had BLM criteria that were <10% different than the paired upstream location

In all, 78 of the 90 facilities had downstream criteria that were <10% different than their paired upstream criteria (Figure 2).

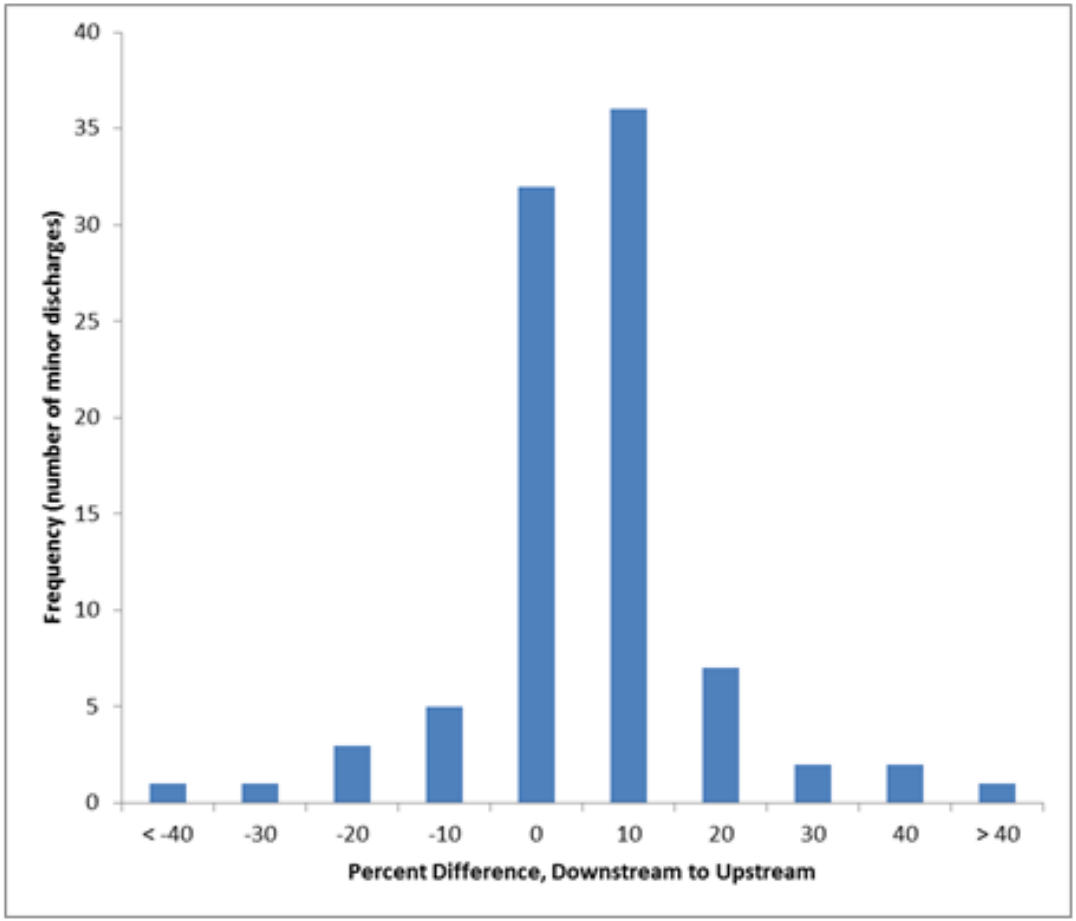


Figure 2. Histogram showing the distribution of the percent difference between paired downstream and upstream chronic BLM copper criteria from a given minor discharge location. Positive percent differences indicate downstream criteria were higher, while negative percent differences indicate upstream criteria were higher.

Effects of Blank Correction

- Blank correction is a common and accepted practice for laboratory analysis
- Provides conservative estimate of degree of contamination
- 16 samples affected, all in Coeur d'Alene region

Appendix 7. Results from U.S. Geological Survey Columbia Environmental Research Center and University of Saskatchewan Interlaboratory Comparison of Analyses for Dissolved Organic Carbon in Water Samples

By William G. Brumbaugh

Figure 7–1. Schematic for interlaboratory comparisons of dissolved organic carbon analyses.

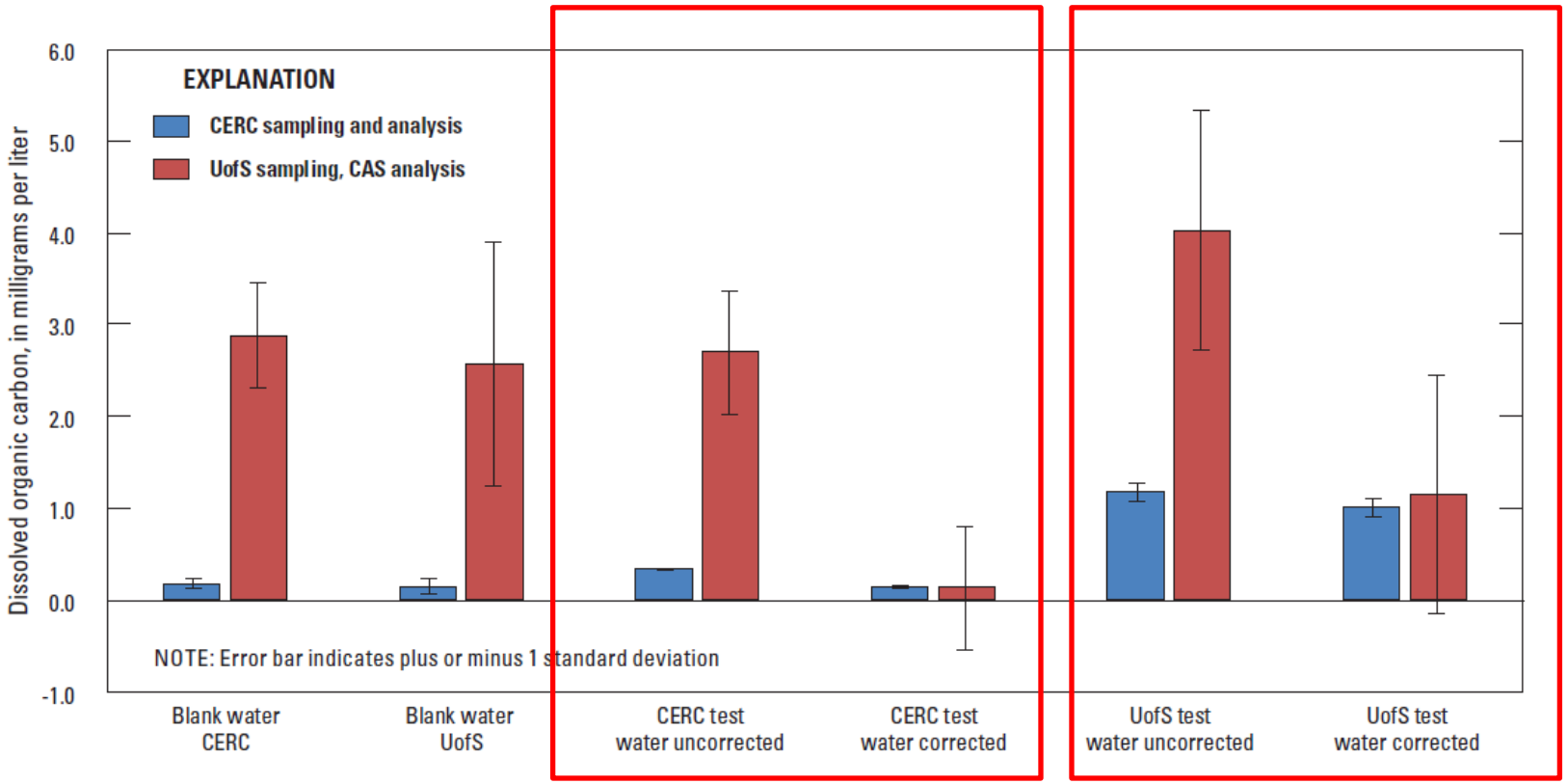


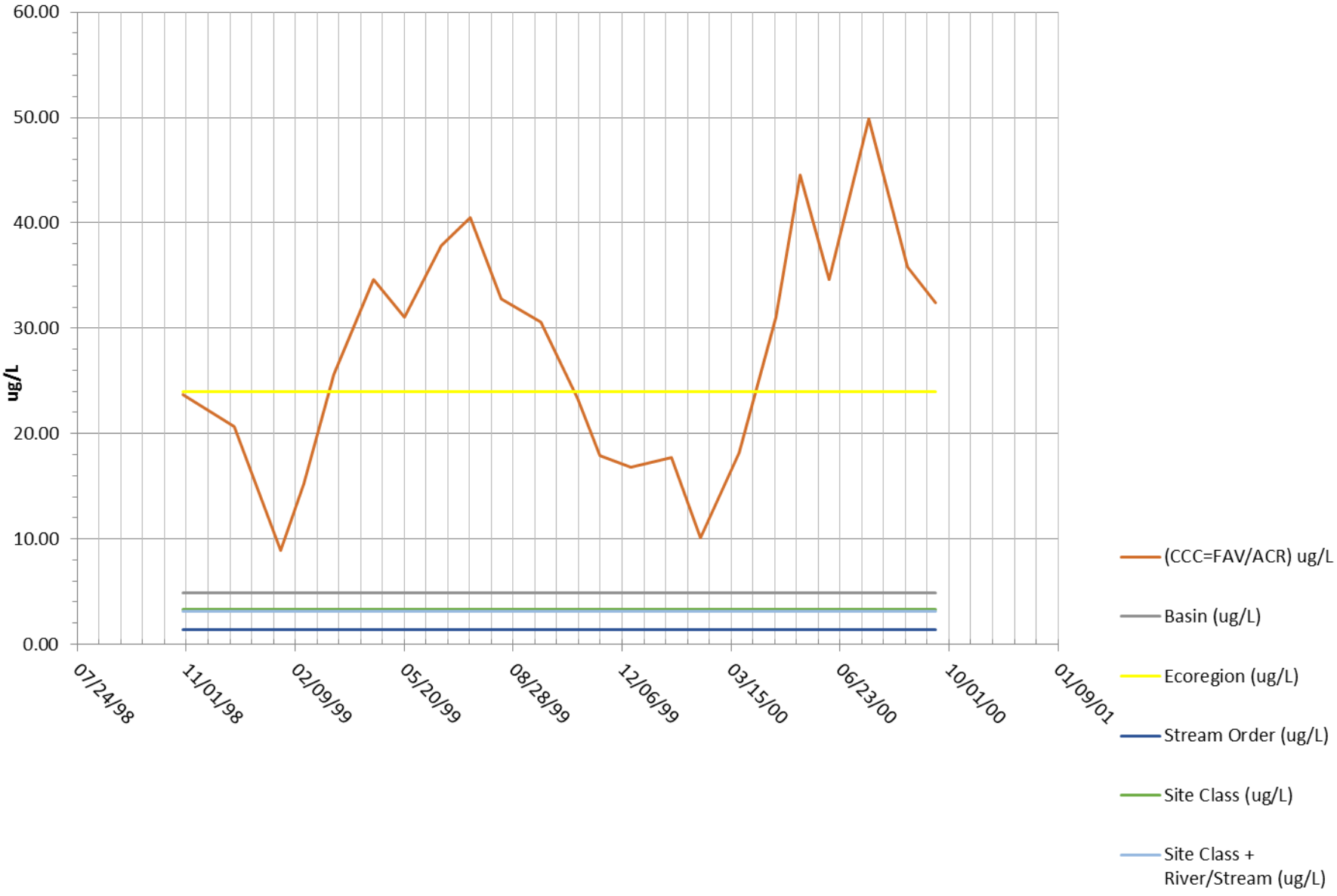
Figure 7–2. Results from U.S. Geological Survey Columbia Environmental Research Center (CERC) and University of Saskatchewan (UofS) November 2010 interlaboratory dissolved organic carbon study. Values represent means (n=3); uncorrected = not blank corrected; corrected = blank subtraction applied.

Effects of Blank Correction

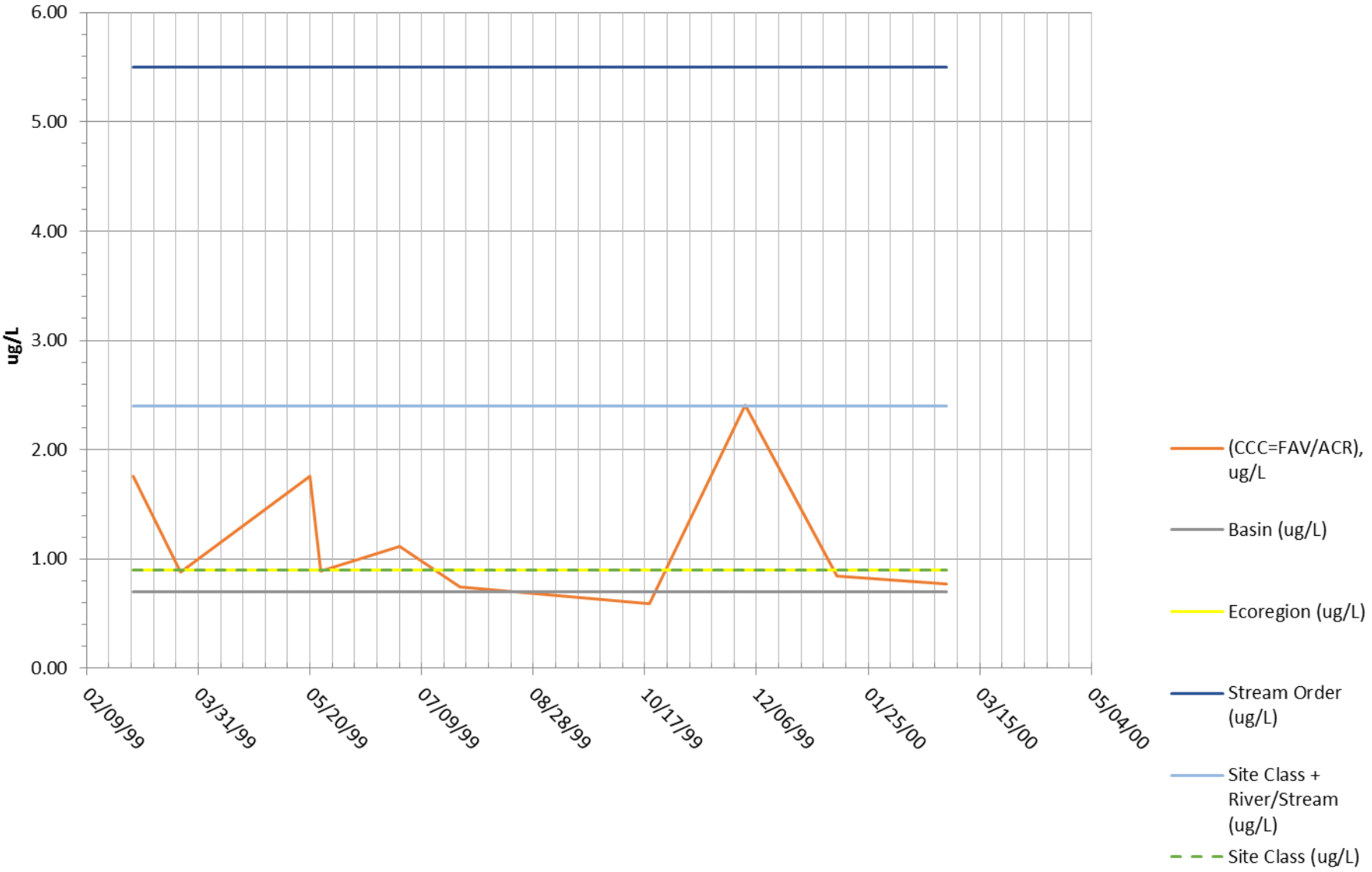
Table 19. Differences in 10th percentile of BLM criteria derived from statewide monitoring when sites affected by DOC blank contamination are adjusted (With Correction) or removed (Without Correction) from regional classification analysis.

Regional Class	10^{th} %ile Chronic Copper Criterion (µg/L)	
	With Correction	Without Correction
Panhandle Basin	0.7	4.7
Norther Rockies Ecoregion	0.9	4.7
3rd Order Streams	2.5	3.0
4th Order Streams	1.0	2.5
5th Order Streams	5.5	5.9
Mountains Site Class	0.9	2.5
Mountains - River	2.4	4.4
Mountains - Stream	0.6	2.3

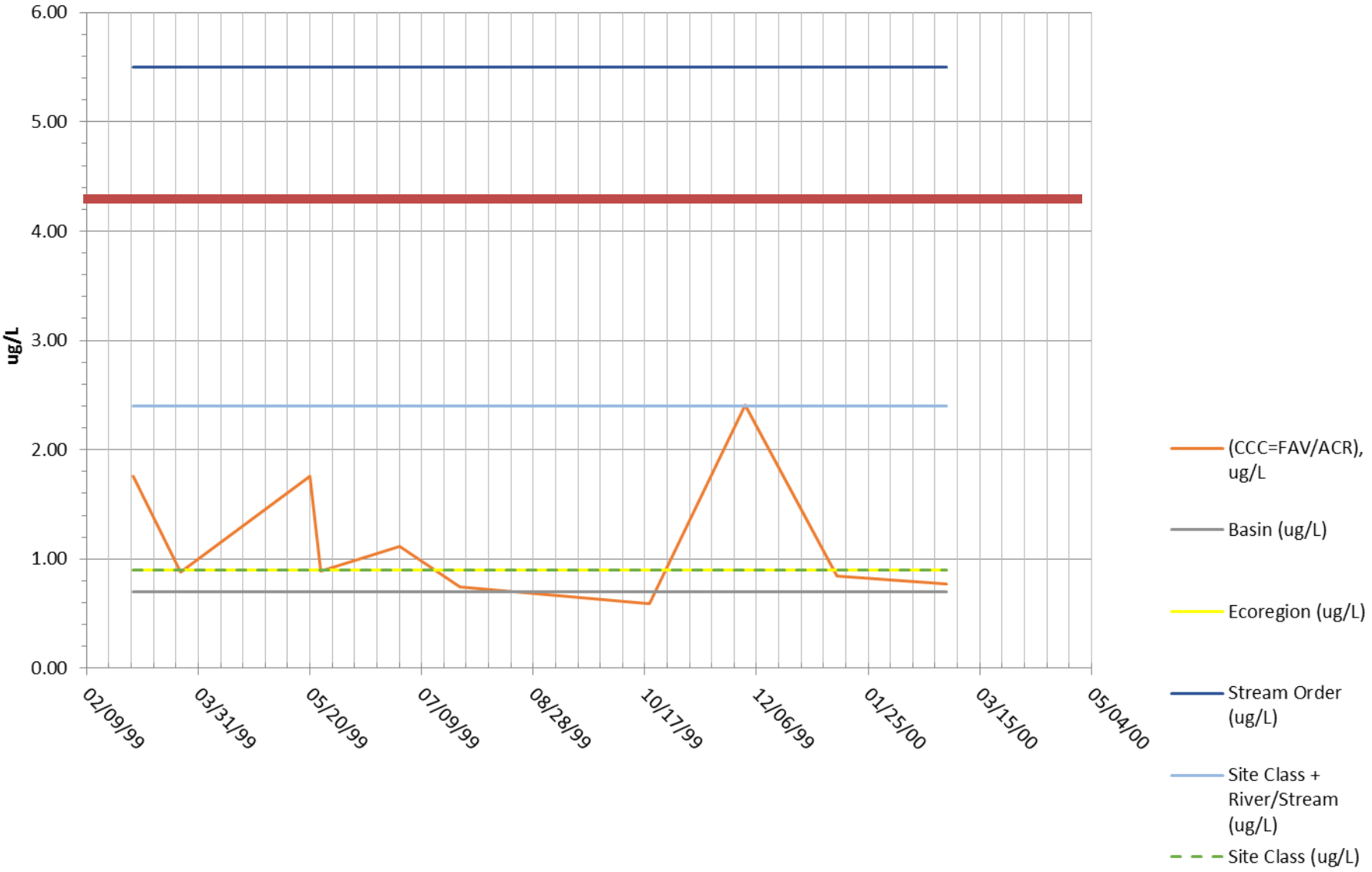
USGS 10068500 BEAR RIVER AT PESCADERO, ID



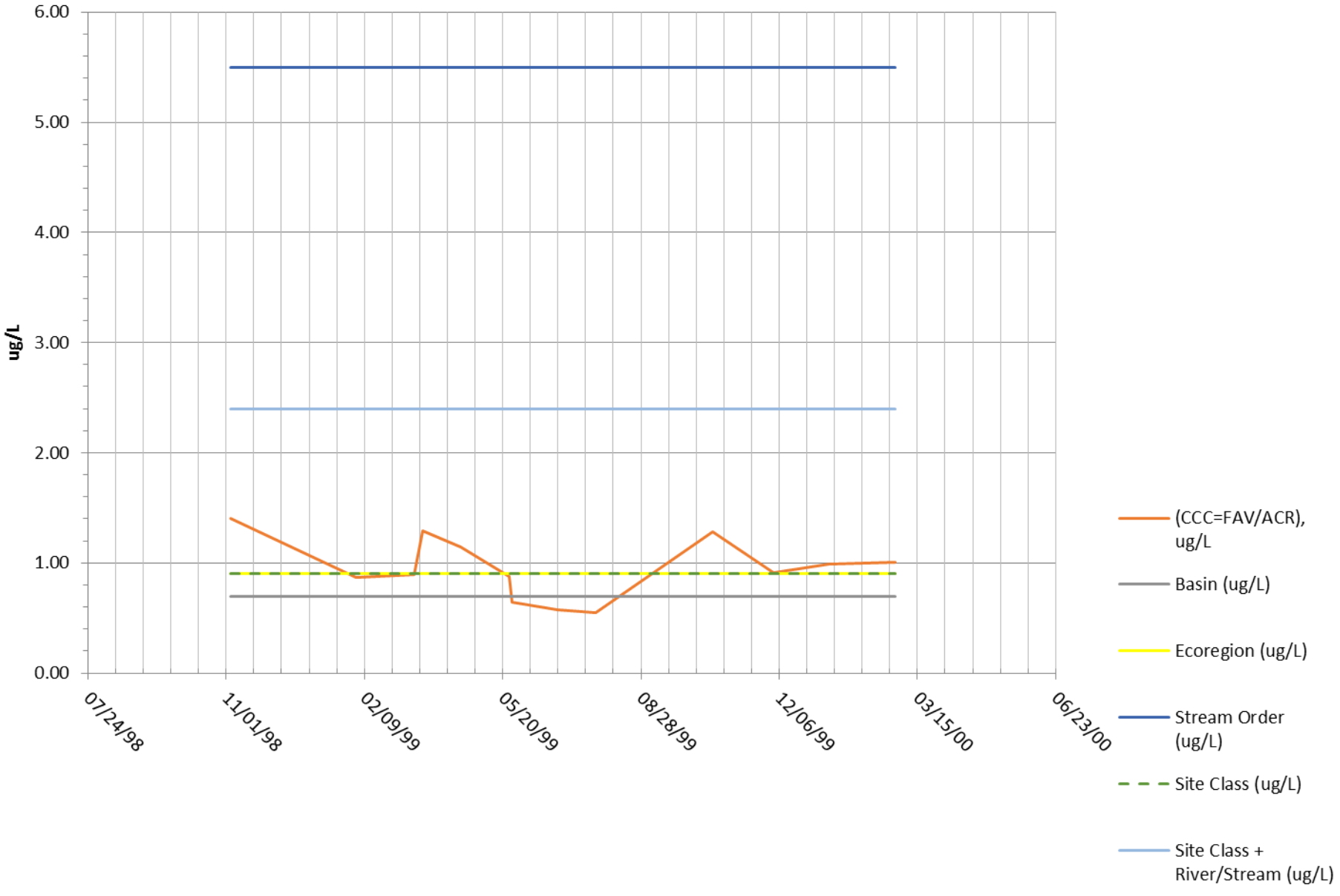
USGS 12413000 NF COEUR D ALENE RIVER AT ENAVILLE ID



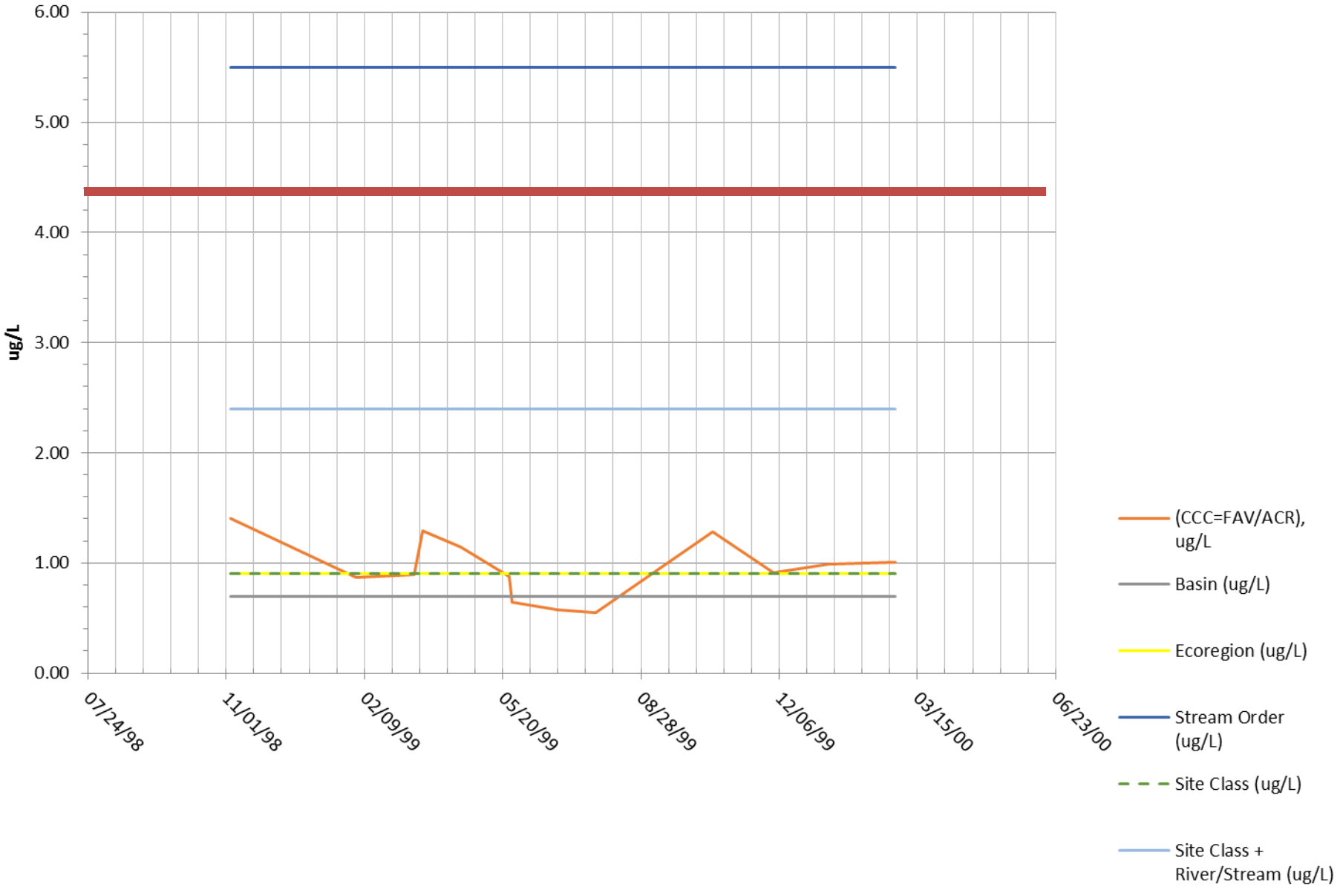
USGS 12413000 NF COEUR D ALENE RIVER AT ENAVILLE ID



USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID



USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID

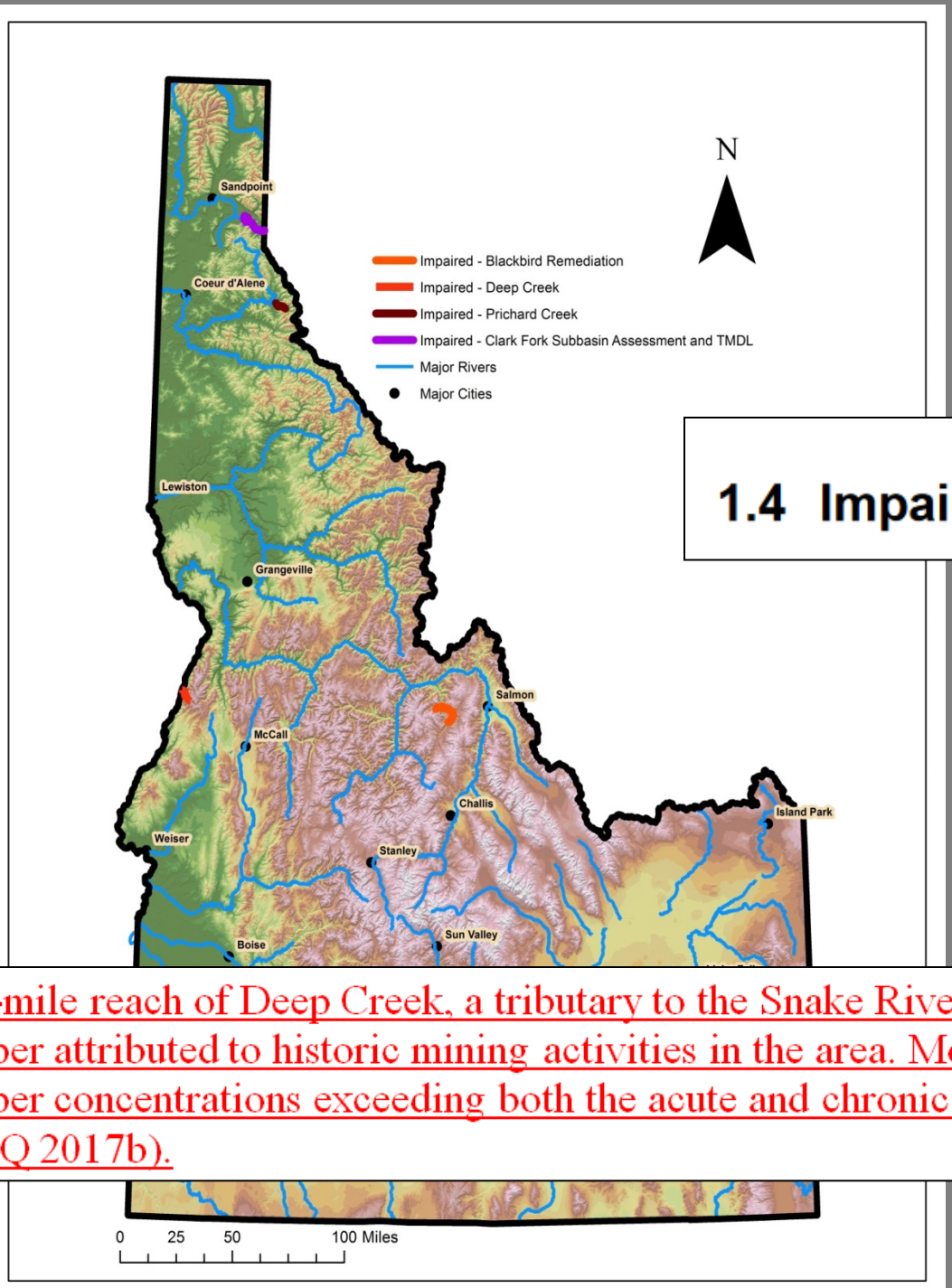


DRAFT Implementation Guidance for the Idaho Copper Criteria for Aquatic Life

Using the Biotic Ligand Model

State of Idaho
Department of Environmental Quality

June 2017



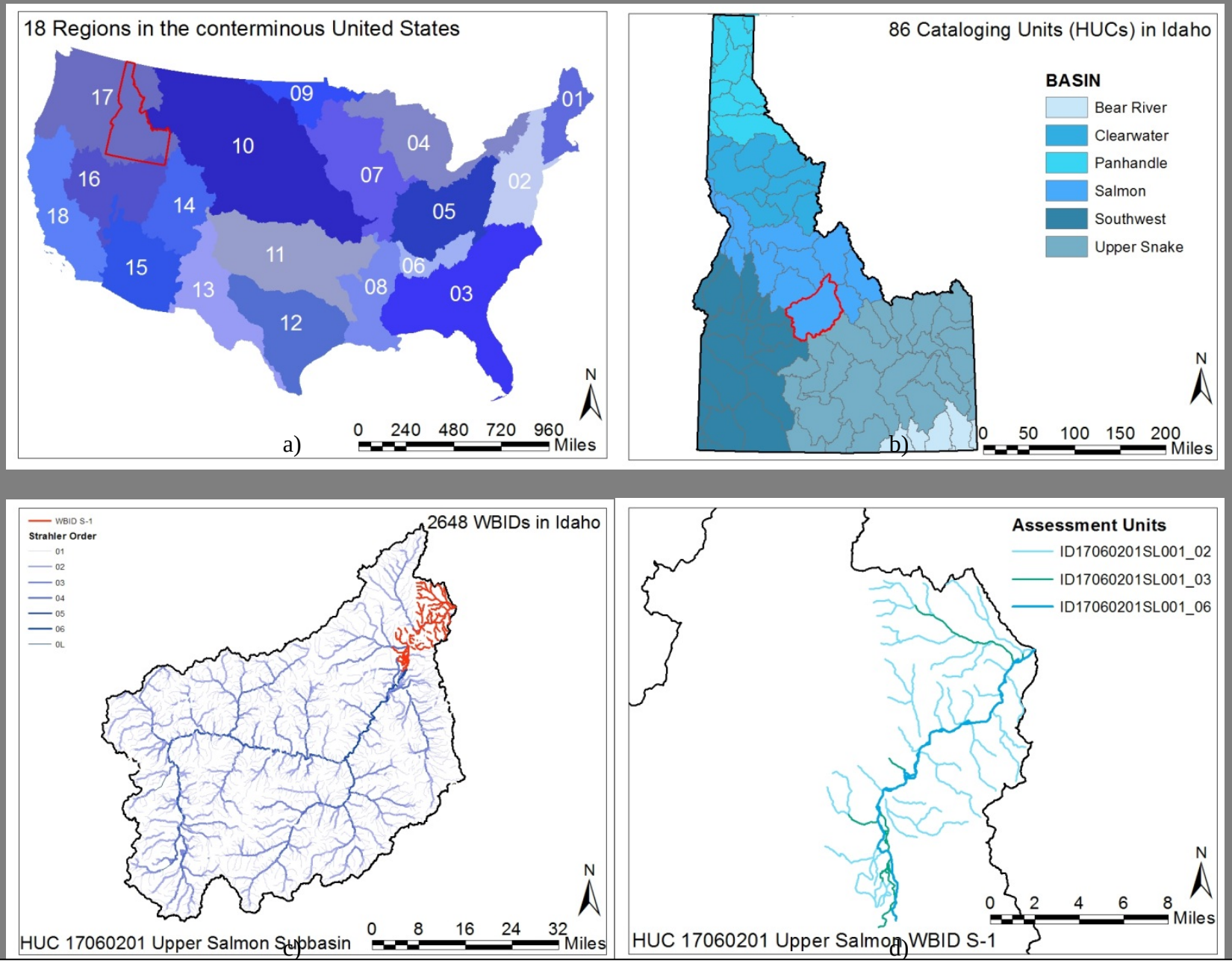
1.4 Impaired waters and TMDLs

A 7-mile reach of Deep Creek, a tributary to the Snake River in Hells Canyon, is impaired due to copper attributed to historic mining activities in the area. Monitoring results showed dissolved copper concentrations exceeding both the acute and chronic water quality criteria for aquatic (DEQ 2017b).

5.2 Special Considerations for Monitoring pH and DOC

It is well known that pH and temperature vary cyclically throughout a single day, and these cycles can be dramatic. The BLM is highly sensitive to pH, and daily pH cycles could result in dramatic changes in the BLM derived criteria. Therefore, when designing monitoring programs or assessing data for derivation of BLM criteria, users should consider using continuous pH data to capture the daily variability of pH at a given site or collecting samples early in the day when temperatures and pH are generally at their lowest. When continuous data are available the minimum daily pH value should be used to generate BLM criteria.

bioavailable conditions for copper can be estimated by identifying critical daily conditions (such as when pH is at its lowest daily value) as well as critical seasonal conditions (such as when DOC concentrations are at their lowest seasonal concentrations).



5.3.1 Ambient Monitoring for the Integrated Report and TMDL development

5.3.1 Ambient Monitoring for the Integrated Report and TMDL development

Many distinct 1st- and 2nd-order tributaries that drain different areas may be lumped together into one AU. DEQ uses data collected from specific sampling sites to infer water quality throughout an AU. It is possible that differences in activities and discharges exist within an AU and all water within the AU may not be of the same quality as found at the sampled sites. Typically, DEQ samples at the most downstream extent of an AU, where it is expected that water quality will reflect the effects of all upstream activities. Even in larger streams, the location of a sampling site could reflect better or worse water quality than the bulk of the AU. When determining the representativeness of a location to an AU, DEQ assessors will consider differences in activities and discharges within the AU. If data are not considered representative, DEQ will provide sufficient rationale to describe why the sampling location is not representative and that the data do not apply to the ~~assessment unit~~AU. If some or all of the sampling sites are not representative of the water, then DEQ may opt to use none of the data or only use data from those sampling sites that do represent the AU. Decisions regarding representativeness of sample results to an AU and any decision to exclude data for assessment purposes would be subject to public comment and EPA approval through the IR approval process.

5.3.2 Monitoring to Identify Criteria for Use in Effluent Limit Development

While it is appropriate to sample at locations representative of an AU for IR and TMDL purposes, this is generally not acceptable for determining applicable criteria for effluent limit development. For effluent limit development, it~~I~~t is instead necessary to characterize site-specific conditions within the effluent's receiving water ~~when developing copper criteria for effluent limit development~~.

6.1.1 Protectiveness of Conservative Criteria Estimates

The conservative criteria estimates presented in Table 2 should be considered protective of the most bioavailable conditions for any given site. These values were lower than calculated IWQCs at all but 6 of the 189 sample locations from which they were derived (DEQ 2017c).

While data sufficient to calculate BLM criteria in Idaho waters are rare, there are limited independent datasets that can be used to assess the protectiveness of the recommended default criteria presented in Table 2.

USGS Site ID	Minimum IWQC (µg/L)	Conservative Criteria Estimate (µg/L)
10068500 – Bear River at Pescadero	8.9	1.4
12392155 – Lighnting Creek at Clark Fork, Idaho	1.1	0.7
12413000 – North Fork Coeur d'Alene River at Enaville	0.6	0.7
12413470 – South Fork Coeur d'Alene River at Pinehurst	0.6	0.7
12413875 – St Joe River at Red Ives	3.7	0.7
12419000 – Spokane River near Post Falls	1.5	0.7
13056500 – Henry's Fork near Rexburg	4.1	1.4
13092747 – Rock Creek above Hwy 30/93 crossing, Twin Falls	10.7	1.6
13154500 – Snake River at King Hill	4.9	2.0

7 Identifying Impairments for the Integrated Report

1. Compare to concurrent IWQC
2. Compare to IWQC from within AU for same season (winter, spring, summer, or fall); go get data to confirm
3. Compare to conservative criteria estimates; go get data to confirm

8 TMDL targets

For AUs identified as impaired and needing TMDLs for copper, TMDL targets and subsequent load and wasteload allocations will be based on a conservative percentile of IWQCs derived from 24 monthly samples (see Section 5.5.2), or an appropriate statistical approach (see Section 5.5.3). If applicable, seasonal load and wasteload allocations may be developed (see 5.5.4).

Discussion

Next Steps

- Comments due 7/28/2017
- Finalize Guidance and Data Report
- Publication of Proposed Rule in Bulletin – 9/6/2017