DRAFT
Statewide Monitoring for Inputs to the Copper Biotic Ligand Model

State of Idaho
Department of Environmental Quality

July 2017 Draft

DRAFT

DRAFT

Printed on recycled paper, DEQ Month Year, PID #, CA code. Costs associated with this publication are available from the State of Idaho Department of Environmental Quality in accordance with Section 60-202, Idaho Code.

DRAFT Statewide Monitoring for Inputs to the Copper Biotic Ligand Model

DRAFT

July 2017 Draft

Prepared by
Idaho Department of Environmental Quality
Water Quality Division
1410 N Hilton
Boise, Idaho 83706

DRAFT

Table of Contents

1 Introduction 7
2 Methods 7
2.1 Site Selection 8
2.2 Field Collection 8
2.3 Laboratory Methods 10
2.4 Data Handling 10
2.5 Quality Assurance Analysis 11
2.5.1 Data Quality Objectives 11
2.5.2 Data Quality Assessment 12
2.6 Derivation of BLM Criteria 16
2.7 Regional Classification 17
3 Results 17
3.1 BLM Criteria 18
3.2 Copper Results 19
3.3 Regional Classification 20
3.3.1 Basin 21
3.3.2 Level III Ecoregion 23
3.3.3 Stream Order 26
3.3.4 Site Class 29
3.3.5 Site Class + River/Stream 31
4 Discussion 34
4.1 Laboratory Processing 34
4.2 Estimating Conservative Criteria 34
4.2.1 Comparison to Other Datasets 34
4.3 Effects of Point Source Discharges on BLM Criteria 40
4.4 Effects of Blank Correction for DOC 40
5 Conclusion 42
References 44
Appendix A. Monitoring Locations 45
Appendix B. Sample Results 61
Appendix C. Biotic Ligand Model Inputs and Criteria Outputs 108
Appendix D. Comparison of Regional Classification 10th Percentile Criteria Estimates to BLM-Derived IWQCs and Discharge at USGS Sites 128
~~1 Introduction ..... 5~~
~~2 Methods ..... 5~~

DRAFT

~~2.1 Site Selection ..... 6~~
~~2.2 Field Collection ..... 6~~
~~2.3 Laboratory Methods ..... 8~~
~~2.4 Data Handling ..... 8~~
~~2.5 Quality Assurance Analysis ..... 9~~
~~2.5.1 Data Quality Objectives ..... 9~~
~~2.5.2 Data Quality Assessment ..... 10~~
~~2.6 Derivation of BLM Criteria ..... 1~~
~~2.7 Regional Classification ..... 1~~
~~3 Results ..... 2~~
~~3.1 BLM Criteria ..... 2~~
~~3.2 Copper Results ..... 3~~
~~3.3 Regional Classification ..... 3~~
~~3.3.1 Basin ..... 4~~
~~3.3.2 Level III Ecoregion ..... 6~~
~~3.3.3 Stream Order ..... 9~~
~~3.3.4 WBAGIII Site Class ..... 12~~
~~3.3.5 WBAGIII Site Class combined with River/Stream ..... 14~~
~~4 Discussion ..... 17~~
~~4.1 Laboratory Processing ..... 17~~
~~4.2 Comparison to Hardness Based Criteria ..... 17~~
~~4.3 Estimating Conservative Criteria ..... 18~~
~~4.4 Comparison to Other Datasets ..... 19~~
~~5 Conclusion ..... 1~~
~~References ..... 3~~
~~Appendix A. Monitoring Locations ..... 1~~
~~Appendix B. Sample Results ..... 1~~
~~Appendix C. Biotic Ligand Model Inputs and Criteria Outputs ..... 1~~

List of Tables

Table 1.Sample container, analytical method, preservation method, and sample holding times. 10
Table 2. Analytical detection and reporting limits 11
Table 3. Relative Percent Differences (RPD) calculated for each site with duplicate samples, as well as minimum and maximum RPDs for each analyte sampled. 13
Table 4. Field blank results. Results below detection limits are denoted as (--). 15
Table 5. Samples affected by DOC blanks with detectable levels of DOC in field blanks, including sample date, blank results, and adjusted DOC concentrations used in derivation of BLM criteria for sample batches affected. 16

DRAFT

Table 6. Summary statistics for sampled parameters, including minimum, maximum, 10th percentile, mean, median, standard deviation (SD), and coefficient of variation (CV). 17
Table 7. BLM derived chronic copper criteria for sites monitored in the spring and fall, with the relative percent difference between results. Negative RPD indicates fall criteria were lower than spring criteria. 18
Table 8. BLM derived copper criteria and copper concentrations from the five sites that had copper results that exceeded the acute or chronic IWQC at the time of sample collection. 20
Table 9. Summary statistics of BLM-derived chronic copper criteria by USGS hydrological basin. 22
Table 10. Summary statistics of BLM-derived chronic copper criteria by Ecoregion. 25
Table 11. Summary statistics for BLM-derived chronic copper criteria by stream order. 28
Table 12. Summary statistics for BLM-derived chronic copper criteria by site class. 30
Table 13 Summary statistics of BLM-derived chronic copper criteria by Site Class + River/Stream. 32
Table 14. Minimum, maximum, 10th percentile, 90th percentile, mean, and median of calculated coefficients of variation (CV) for all BLM input parameters. 33
Table 15. Potential conservative criteria estimates. Values represent the 10th percentile of BLM criteria derived from statewide monitoring. 35
Table 16. Comparison of minimum chronic copper criterion measured at USGS sites to regional conservative criteria estimates based on minimum and 10th %ile values. Values in bold indicate the estimate is below the minimum measured. 37
Table 17. Comparison of spring copper criterion measured at sites where spring BLM criteria were lower than fall criteria, compared to regional conservative criteria estimates based on 10th %ile values. Values in bold indicate the estimate is below the minimum measured. 39
Table 18. Regional classifications affected by removal of 16 samples affected by detectable DOC in sample blanks. 41
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. 41
~~Table 1.Sample container, analytical method, preservation method, and sample holding times. .. 8~~
~~Table 2. Analytical detection and reporting limits. ..... 9~~
~~Table 3. Relative Percent Differences (RPD) calculated for each site with duplicate samples, as well as minimum and maximum RPDs for each analyte sampled. ..... 1~~
~~Table 4. Field blank results. ..... 1~~
~~Table 5. Samples affected by DOC blanks with detectable levels of DOC in field blanks, including sample date, blank results, and adjusted DOC concentrations used in derivation of BLM criteria for sample batches affected. ..... 1~~
~~Table 6. Summary statistics for sampled parameters, including minimum, maximum, 10th percentile, mean, median, standard deviation (SD), and coefficient of variation (CV). .. 2~~
~~Table 7. BLM derived chronic copper criteria for sites monitored in the spring and fall, with the relative percent difference between results. Negative RPD indicates fall criteria were lower than spring criteria. ..... 3~~

DRAFT

~~Table 8. BLM derived copper criteria and copper concentrations from the five sites that had copper results that exceeded the acute or chronic IWQC at the time of sample collection. ..... 3~~
~~Table 9. Summary statistics of BLM-derived chronic copper criteria by USGS hydrological basin. ..... 5~~
~~Table 10. Summary statistics of BLM-derived chronic copper criteria by EPA Level III Ecoregion. ..... 8~~
~~Table 11. Summary statistics for BLM-derived chronic copper criteria by Strahler stream order. ..... 11~~
~~Table 12. Summary statistics for BLM-derived chronic copper criteria by WBAGIII stream site class. ..... 13~~
~~Table 13 Summary statistics of BLM-derived chronic copper criteria by WBAGIII classes divided into Rivers or Streams based on Strahler order. ..... 15~~
~~Table 14. Minimum, maximum, 10th percentile, 90th percentile, mean, and median of calculated coefficients of variation (CV) for all BLM input parameters. ..... 16~~
~~Table 15. Comparison of minimum chronic copper criterion measured at USGS sites to regional conservative criteria estimates based on minimum and 10th %ile values. Values in bold indicate the estimate is below the minimum measured. ..... 1~~
~~Table 16. Comparison of spring copper criterion measured at sites where spring BLM criteria were lower than fall criteria, compared to regional conservative criteria estimates based on 10th %ile values. Values in bold indicate the estimate is below the minimum measured. ..... 1~~

List of Figures

Figure 1. Location of biotic ligand model (BLM) input monitoring locations throughout Idaho. 9
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. 19
Figure 3. Distribution of BLM input parameters by basin. 21
Figure 4. Distribution of BLM-derived chronic copper criteria by USGS hydrologic basin. 22
Figure 5. Distribution of BLM input parameters by Ecoregion. BM = Blue Mountains; CBR = Central Basin and Range; CP = Columbia Plateau; IB = Idaho Batholith; MR = Middle Rockies; NBR = Northern Basin and Range; NR = Northern Rockies; SRP = Snake River Plain; WUM = Wasatch and Uinta Mountains; WB = Wyoming Basin. .. 23
Figure 6. Distribution of BLM-derived chronic copper criteria by Ecoregion. 24
Figure 7. Distribution of BLM input paramaters by stream order. Some sites were located in non-flowing or manmade waters that do not have a stream order, indicated by NA. 26
Figure 8. Distirbution of BLM-derived chronic copper criteria by stream order. Some sites were located in non-flowing or manmade waters that do not have a stream order, indicated by NA. 27

DRAFT

Figure 9. Distribution of BLM parameters by site class. PPBV = Plains, Plateaus, and Broad Valleys. 29
Figure 10. Distribution of BLM-derived chronic copper criteria by site class. PPBV = Plains, Plateaus, and Broad Valleys. 30
Figure 11. Distribution of BLM input parameters by Site Class + River/Stream designation. For purposes of this classification scheme, rivers are any water with stream order ≥5, while streams are any water with stream order <5. 31
Figure 12. Distribution of BLM-derived chronic copper criteria by Site Class + River/Stream.. 32
Figure 13. Distribution of calculated coefficient of variation for all BLM input parameters by site class system. 33
~~Figure 1. Location of biotic ligand model (BLM) input monitoring locations throughout Idaho. ..... 7~~
~~Figure 2. Distribution of BLM input parameters by basin. ..... 4~~
~~Figure 3. Distribution of BLM-derived chronic copper criteria by USGS hydrologic basin. ..... 5~~
~~Figure 4. Distribution of BLM input parameters by Level III Ecoregion. BM = Blue Mountains; CBR = Central Basin and Range; CP = Columbia Plateau; IB = Idaho Batholith; MR = Middle Rockies; NBR = Northern Basin and Range; NR = Northern Rockies; SRP = Snake River Plain; WUM = Wasatch and Uinta Mountains; WB = Wyoming Basin. ..... 6~~
~~Figure 5. Distribution of BLM-derived chronic copper criteria by EPA level III Ecoregion. ..... 7~~
~~Figure 6. Distribution of BLM input paramaters by Strahler stream order. Some sites were located in non-flowing or manmade waters that do not have a stream order, indicated by NA. ..... 9~~
~~Figure 7. Distirbution of BLM-derived chronic copper criteria by Strahler stream order. Some sites were located in non-flowing or manmade waters that do not have a stream order, indicated by NA. ..... 10~~
~~Figure 8. Distribution of BLM parameters by Water Body Assessment Guidance (WBAGIII) site class. PPBV = Plains, Plateaus, and Broad Valleys. ..... 12~~
~~Figure 9. Distribution of BLM-derived chronic copper criteria by WBAGIII stream site class. PPBV = Plains, Plateaus, and Broad Valleys. ..... 13~~
~~Figure 10. Distribution of BLM input parameters by WBAGIII and River/Stream designation. For purposes of this classification scheme, rivers are any water with stream order ≥5, while streams are any water with stream order <5. ..... 14~~
~~Figure 11. Distirbution of BLM-derived chronic copper criteria by WBAGIII classes divided into Rivers or Streams based on Strahler order. ..... 15~~
~~Figure 12. Distribution of calculated coefficient of variation for all BLM input parameters by site class system. ..... 16~~
~~Figure 13. Comparison of BLM derived to hardness based criteria. The solid black line is the 1:1 line; sites above the line have BLM criteria that are more stringent than the hardness based criteria, sites below the line have BLM criteria that are less stringent. Idaho's hardness based criteria included a minimum hardness floor of 25 mg/L. ..... 18~~

DRAFT

DRAFT

1 Introduction

In 2015, the Idaho Department of Environmental Quality (DEQ) initiated rulemaking to update the existing hardness-dependent copper criteria by using the US Environmental Protection Agency's (EPA's) 2007 304(a) copper criteria, which uses other physicochemical properties of the water (e.g., pH, dissolved organic carbon) to predict water-body specific criteria using the Biotic Ligand Model (BLM). This update is a reasonable and prudent alternative identified in the National Oceanic and Atmospheric Administration's (NOAA's) biological opinion (BiOp) on Idaho's criteria for toxic substances to support aquatic life. To derive copper criteria using the BLM, inputs for the following physical and chemical characteristics of the water must be measured: temperature, pH, alkalinity, and the concentration of copper, dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, and chloride.

While limited data are available from state and national monitoring efforts, it is not geographically representative. In addition, there are very little DOC data available in Idaho. Therefore, when evaluating and implementing the BLM, DEQ will need to have some information on basic defaults that can be used when data are unavailable for a site.

Like all equation- or model-based criteria, BLM-derived criteria are site and time specific. The model calculates both acute and chronic criteria based on site specific physical and chemical inputs. The criteria calculated from a single set of inputs are referred to as instantaneous water quality criteria (IWQC). The IWQC represents the criteria that would be protective of aquatic life at the time that the data were collected.

The input data are variable over time and space, so any single IWQC is time and place specific and will not necessarily be protective of aquatic life at any given site; if site chemistry changes, individual IWQCs will change.

However, because the BLM is particularly sensitive to DOC and pH, it may be possible to identify the critical time period for copper toxicity (i.e., when DOC is expected to be at its lowest concentrations).

The goal of this monitoring effort is to inform guidance development by identifying conservative criteria estimates for copper that can be used for implementing the copper criteria when site-specific data are not available. The following questions will be addressed:

- What are the current copper and BLM conditions at locations throughout the state?
- Can Idaho waters be classified into regions based on physical and chemical properties, and can existing classifications be used to group waters (e.g., terrestrial ecoregions, freshwater ecoregions, basins and stream order, etc.)?
- Can critical BLM conditions be identified for each classification, and can these be used in place of derived BLM criteria when site-specific data are missing?

2 Methods

DEQ collected grab samples for dissolved copper and BLM input parameters from 204 locations throughout Idaho from September 6, 2016 to October 27, 2016. Monitoring followed the

DRAFT

procedures outlined in the *Quality Assurance Project Plan: Statewide Monitoring for Inputs to the Copper Biotic Ligand Model* (QAPP; DEQ 2016a).

2.1 Site Selection

Monitoring occurred downstream and upstream of minor industrial and municipal discharge facilities and upstream and downstream of dischargers with current copper limits. Sites were intended to provide DEQ with both ambient and mixed effluent water quality information at each facility, and to be used to provide data necessary for analysis and to inform permit development after copper criteria are updated to the BLM. Downstream monitoring occurred far enough below the outfall to allow for sufficient mixing of effluent with the receiving water. In addition, monitoring locations that were not associated with discharge facilities were added when there was significant regional interest in a particular water body.

Monitoring locations targeted for sampling are displayed in Figure 1. Complete site information for all monitored sites can be found in Appendix A.

Not all minor discharge facilities had flowing water both upstream and downstream at the time of monitoring. When locations were not sampleable crews indicated the reason that samples were not collected.

A total of 200 sites were monitored in the fall between 9/6/2016 and 10/27/2016 to represent baseflow conditions.

A total of 90 minor discharge facilities had paired upstream and downstream locations that were sampleable, representing 180 sites.

Eleven sites were revisited in the spring between 3/29/2017 and 4/24/2017. Spring sample locations were selected based on geographic representation and accessibility. Results from spring monitoring were not used in analysis other than to compare to fall criteria results.

2.2 Field Collection

Grab samples were collected following the procedures outlined in the QAPP (DEQ 2016).

Samples were collected from a well-mixed portion of the water body as close to the thalweg as could be safely accessed.

Physical parameters (temperature, and pH) were collected facing upstream, with a calibrated multi-parameter probe or sonde at 0.5 m depth in a well-mixed portion of the stream. Measurements were allowed to equilibrate before results were recorded.

Water samples were collected facing upstream, and were preserved according to the QAPP. All samples were placed in a cooler on ice and held at ≤ 4 °C for transport or shipment to the contract laboratory.

Samples were delivered to the contract laboratory within 48 hours of collection.

DRAFT

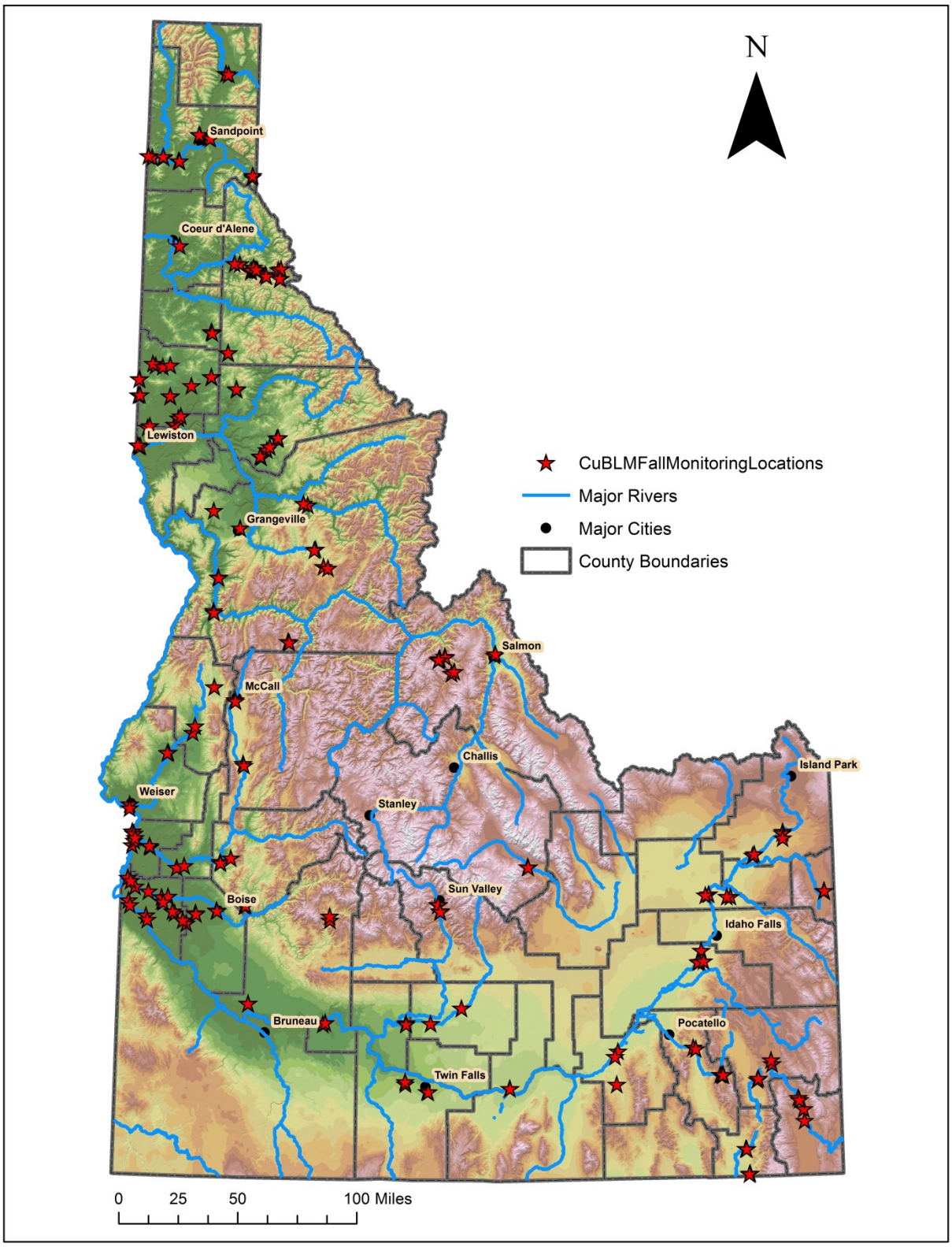


Figure 1. Location of biotic ligand model (BLM) input monitoring locations throughout Idaho.

2.3 Laboratory Methods

All samples were analyzed by Anatek Labs, Inc. (Moscow, Idaho).

Upon receipt, the laboratory filtered dissolved metals and DOC samples through 0.45 µm filters and preserved with acidification to pH < 2. Analytical methods, preservatives, and holding times are presented in Table 1.

Table 1.Sample container, analytical method, preservation method, and sample holding times.

Sample Container	Parameter	Analytical Method	Preservative	Holding Time
500 mL HDPE	Dissolved Ca, Mg, Na, K	EPA 200.7	4 °C. Filter with 0.45 µm filter as soon as practical. Acidify to pH <2 after filtration.	28 days unpreserved. 6 months preserved.
	Cu	EPA 200.8	Filter with 0.45 µm filter as soon as practical. 4 °C. Nitric acid within 2 weeks.	2 weeks unpreserved. 6 months preserved.
	SO_4, Cl	EPA 300.0	4 °C.	28 days.
	Alkalinity	SM 2320 B	4 °C.	14 days.
40 mL amber glass vial	DOC	SM 5310 B	4 °C. Filter with 0.45 µm filter within 48 hrs. Acidify to pH <2 after filtration.	7 days

2.4 Data Handling

Data that were reported at or below the laboratory detection limit (DL) were assigned a value equal to one-half the DL. Analytical results that were greater than the DL but less than the reporting limit were assigned the numeric value of the DL, with the exception of copper results. All copper results were analyzed as reported, regardless of whether or not they were below the analytical reporting limit. Analytical detection and reporting limits are presented in Table 2.

DRAFT

Table 2. Analytical detection and reporting limits.

Analyte	Detection Limit (mg/L)	Reporting limit (mg/L)
Dissolved Calcium	0.01	0.1
Dissolved Magnesium	0.0495	0.1
Dissolved Sodium	0.0079	0.1
Dissolved Potassium	0.0495	0.1
Dissolved Copper	0.0001	0.001
Dissolved Organic Carbon	0.04	0.2
Sulfate	0.047	10
Chloride	0.043	0.1
Alkalinity	2.78	5

All reported summary statistics and BLM derived criteria were based on data that were handled in this fashion.

2.5 Quality Assurance Analysis

All quality assurance (QA) and quality control (QC) procedures followed those outlined in the *Quality Assurance Project Plan: Statewide Monitoring for Inputs to the Copper Biotic Ligand Model* (QAPP; DEQ 2016a).

Data quality was evaluated by collection field QC samples at ≥ 10% of sample sites. Field duplicates should represent ≥ 5% of sites, and field blanks should represent ≥ 5% of sites.

2.5.1 Data Quality Objectives

A sample was considered a complete sample only when valid results were obtained for all physical and chemical parameters required by the BLM (see Section 1). Data from sites that did not have a complete sample were excluded from BLM and QA/QC analyses.

Precision was measured as the relative percent difference (RPD) of field duplicates. RPD was calculated using the following equation when both C_1 and C_2 > 5 times the laboratory method detection limit (MDL):

$$|\boldsymbol{RPD}| = \left|\frac{(\boldsymbol{C_1}-\boldsymbol{C_2})}{(\boldsymbol{C_1}+\boldsymbol{C_2})/\mathbf{2}}\right| \times \mathbf{100}$$

Where: C_1 = concentration in first sample

C_2 = concentration in the second/duplicate sample

The data quality objective for precision for this project was an RPD ≤ 50%, with a goal of ≤ 20%.When one or both C1 and C2 are < 5 times the MDL, the results were considered within control limits.

2.5.2 Data Quality Assessment

A total of 15 sites were sampled for field duplicates, representing 8% of all sites sampled. Not all field duplicates included DOC samples; only 8 field sites had DOC duplicate results reported, representing 4.2% of all sites. Overall, there were 128 field duplicate analytical results reported.

Calculated RPDs for field duplicates ranged from 0.0 – 48.3%, with an average RPD of 3.6%. Calculated RPDs are presented in Table 3.

DRAFT

Table 3. Relative Percent Differences (RPD) calculated for each site with duplicate samples, as well as minimum and maximum RPDs for each analyte sampled.

Site ID	Relative Percent Difference								
	Dissolved Copper	DOC	Dissolved Calcium	Dissolved Magnesium	Dissolved Sodium	Dissolved Potassium	Sulfate	Chloride	Alkalinity
ID0001155D	1.8	NA	0.3	0.6	0.3	1.0	10.4	10.1	0.6
ID0020133D	27.3	2.2	0.3	0.0	0.0	0.4	4.8	6.9	2.4
ID0020133U	0.5	1.5	0.7	1.0	0.0	1.1	3.1	4.5	0.8
ID0020389U	7.3	NA	2.1	0.4	0.9	1.5	0.0	1.0	1.4
ID0020753D	4.9	1.2	0.0	0.0	0.6	0.6	1.0	0.6	0.7
ID0020753U	18.0	1.2	2.8	3.7	2.9	4.5	0.7	0.6	2.8
ID0021822D	20.1	2.5	2.2	1.5	2.2	2.3	3.2	2.0	8.9
ID0021831U	3.6	NA	3.7	2.8	2.1	2.5	1.7	3.4	0.6
ID0022501U	1.4	1.3	3.3	3.6	2.6	3.0	0.0	5.7	29.4
ID0023167U	3.1	NA	3.6	1.4	0.8	3.9	0.0	6.6	7.9
ID0024988D	0.0	2.2	3.5	3.8	2.2	4.1	47.2	0.0	8.6
ID0024988U	13.6	2.2	0.2	1.0	0.0	0.0	2.1	1.8	1.6
ID0027383U	48.3	NA	3.0	3.1	3.9	0.2	0.0	0.0	3.0
ID0027952D	4.2	NA	0.7	0.9	2.0	6.3	0.0	2.0	2.2
ID0028355D	2.6	NA	0.4	0.0	0.3	0.1	1.2	0.8	0.9
min	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6
max	48.3	2.5	3.7	3.8	3.9	6.3	47.2	10.1	29.4

DRAFT

A total of 20 field blank samples were analyzed, representing 10.6% of all sites sampled. However, only 15 field blank samples were analyzed for DOC, representing 8% of all sites sampled. Overall, there were 175 field blank results reported.

Each field blank was considered to represent a sample batch – all samples collected by each DEQ regional office since the last field blank.

Of the 175 field blank results, 154 were below detection limits, with 21 field blanks having detectable levels of analytes. Dissolved copper blanks accounted for 6, DOC accounted for 3, dissolved calcium accounted for 4, and dissolved sodium accounted for 8 of the field blank results above the reported detection limits. Field blank results are presented in Table 4.

Copper blanks with detectable concentrations of dissolved copper ranged from 0.0001–0.0049 mg/L. Copper blanks were not considered to affect results since dissolved copper are not used in deriving BLM criteria. In addition, the only copper results that indicated exceedances of concurrent BLM criteria were well above the results reported in these blanks (see Section 3).

DOC blanks with detectable concentrations ranged from 0.208–0.236 mg/L. These blank results affected 3 sample batches and were considered to affect results for 16 samples. The DOC results from these 16 samples were reduced by the associated blank concentrations (see Brumbaugh 2014). Results from affected DOC samples and the resulting DOC concentration adjustments are reported in Table 5.

Dissolved calcium and dissolved sodium field blanks with detectable concentrations ranged from 0.135–0.163 and 0.113–0.306 mg/L, respectively. These were well below the minimum concentrations reported from field samples (see Section 3) and did not affect derived BLM criteria.

All sample results, including QC sample results, are available in Appendix B.

DRAFT

Table 4. Field blank results. Results below detection limits are denoted as (--).

Site ID	Copper, mg/L	DOC, mg/L	Calcium, mg/L	Magnesium, mg/L	Sodium, mg/L	Potassium, mg/L	Sulfate, mg/L	Chloride, mg/L	Alkalinity, mg/L CaCO3
ID0020117U	--	0.208	--	--	--	--	--	--	--
ID0020133D	0.0001	--	0.15	--	0.127	--	--	--	--
ID0020133U	--	--	0.16	--	0.122	--	--	--	--
ID0020338U	--	NA	--	--	--	--	--	--	--
ID0020567D	0.0041	0.235	--	--	--	--	--	--	--
ID0020753D	--	0.236	--	--	--	--	--	--	--
ID0020753U	--	--	--	--	0.113	--	--	--	--
ID0021016U	--	NA	--	--	--	--	--	--	--
ID0021024D	0.0001	NA	--	--	--	--	--	--	--
ID0021229D2	--	--	--	--	--	--	--	--	--
ID0022004U	--	NA	--	--	--	--	--	--	--
ID0022012U	--	--	--	--	0.281	--	--	--	--
ID0022047D	0.0004	--	--	--	--	--	--	--	--
ID0022501U	0.0049	--	--	--	0.284	--	--	--	--
ID0023604U	0.0003	--	--	--	0.306	--	--	--	--
ID0024350D	--	--	--	--	--	--	--	--	--
ID0024988D	--	--	0.14	--	0.119	--	--	--	--
ID0024988U	--	--	0.15	--	0.115	--	--	--	--
ID0025071D	--	--	--	--	--	--	--	--	--
ID0025488D	--	NA	--	--	--	--	--	--	--

DRAFT

Table 5. Samples affected by DOC blanks with detectable levels of DOC in field blanks, including sample date, blank results, and adjusted DOC concentrations used in derivation of BLM criteria for sample batches affected.

Site ID	DEQ Regional Office	Date	DOC (mg/L)	DOC Blank (mg/L)	Adjusted DOC (mg/L)
ID0000060D	Coeur d'Alene	10/4/2016	0.549	NA	0.314
ID0000060U	Coeur d'Alene	10/4/2016	0.464	NA	0.229
ID0000159D	Coeur d'Alene	10/4/2016	0.54	NA	0.305
ID0000159U	Coeur d'Alene	10/4/2016	0.516	NA	0.281
ID0000167D	Coeur d'Alene	10/4/2016	0.385	NA	0.15
ID0000167U	Coeur d'Alene	10/4/2016	0.348	NA	0.113
ID0020567D	Coeur d'Alene	10/4/2016	0.416	0.235	0.181
ID0020567U	Coeur d'Alene	10/4/2016	0.405	NA	0.17
ID0021296D	Coeur d'Alene	10/4/2016	0.705	NA	0.47
ID0021296U	Coeur d'Alene	10/4/2016	0.859	NA	0.624
ID0025429D	Coeur d'Alene	10/4/2016	0.493	NA	0.258
ID0025429U	Coeur d'Alene	10/4/2016	0.464	NA	0.229
ID0020117D	Coeur d'Alene	10/5/2016	0.66	NA	0.452
ID0020117U	Coeur d'Alene	10/5/2016	0.644	0.208	0.436
ID0022071D	Coeur d'Alene	10/5/2016	0.585	NA	0.377
ID0022071U	Coeur d'Alene	10/5/2016	0.664	NA	0.456
ID0020753D	Twin Falls	10/10/2016	1.62	0.236	1.384

2.6 Derivation of BLM Criteria

BLM criteria were derived using the BLM Freshwater version 3.1.2.37 (Windward Environmental LLC, 2015; available at http://www.windwardenv.com/biotic-ligand-model/#). BLM criteria were calculated for copper using full site chemistry and the US EPA WQC calculation function of the BLM. Criteria were only calculated for sites with results for all required BLM input parameters with the exception of humic acid fraction and sulfide. For humic acid fraction, a default value of 10% was used for all samples; for sulfide, a default value of near-zero (1×10^{-8} mg/L) was used for all samples.

Differences between upstream and downstream locations from a given minor discharge facility were calculated as percent difference according to the following equation:

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

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

C_U = chronic BLM criteria from upstream sample (µg/L)

Positive percent difference indicates that the downstream criteria is greater than the upstream criteria; negative percent difference indicates that the upstream criteria is greater than the downstream criteria.

2.7 Regional Classification

We considered regional classification methods to decrease variability among BLM inputs and BLM derived criteria. Appropriate regional classifications may be used to estimate protective criteria for waters where input data are not available or are incomplete. The following regional classification schemes were analyzed:

- Idaho administrative basins as described in Idaho Water Quality Standards; hereafter referred to as Basins (IDAPA 58.01.02.109-160)
- Level III Ecoregions; hereafter referred to as Ecoregions (EPA 2013)
- Stream Order
- Water Body Assessment Guidance Site Classes; hereafter referred to as Site Class (DEQ 2016b)
- Site Class combined with stream size, where rivers are any water with stream order ≥5, while streams are any water with stream order <5; hereafter referred to as Site Class + River/Stream.

3 Results

Valid complete samples were collected from 189 discrete sampling locations throughout the state (Figure 1). All reported results are available in Appendix B.

For fall samples, the minimum, maximum, 10th percentile, mean, median, standard deviation, and coefficient of variation for all sampled parameters are presented in Table 6.

Table 6. Summary statistics for sampled parameters, including minimum, maximum, 10th percentile, mean, median, standard deviation (SD), and coefficient of variation (CV).

Parameter	min	max	10th %ile	mean	median	SD	CV
Temp (°C)	4.1	18.0	8.3	11.8	11.5	3.0	26
pH	5.5	9.4	7.4	7.9	8.0	0.5	7

Cu (mg/L)	0.0001	0.0067	0.0002	0.0007	0.0005	0.0008	120
DOC (mg/L)	0.35	14.20	0.66	2.21	1.86	1.66	75
Ca (mg/L)	1.6	88.0	4.8	26.1	18.6	20.7	79
Mg (mg/L)	0.3	71.0	0.9	9.4	5.0	11.4	122
Na (mg/L)	0.5	92.8	2.1	13.5	6.0	14.7	108
K (mg/L)	0.2	18.7	0.5	3.0	1.6	3.4	113
SO4 (mg/L)	0.0	111.0	0.0	20.7	11.3	27.1	131
Cl (mg/L)	0.2	106.0	0.5	12.2	3.1	17.8	147
ALK (mg CaCO3/L)	6.5	478.0	19.2	104.3	68.5	91.2	87

3.1 BLM Criteria

For fall samples, BLM derived chronic criteria ranged from 0.24–52.2 µg/L. The 10th percentile for all chronic criteria was 1.3 µg/L. The mean chronic criterion was 9.1 µg/L, with a standard deviation of 6.85 µg/L and a coefficient of variation of 75%.

Of the 11 sites sampled in the spring, 6 had chronic criteria that were higher than the fall chronic criteria. The percent difference ranged from -130–146%. Fall and spring criteria results are presented in Table 7.

Table 7. BLM derived chronic copper criteria for sites monitored in the spring and fall, with the relative percent difference between results. Negative RPD indicates fall criteria were lower than spring criteria.

	Chronic Copper Criterion (µg/L)		Relative Percent
Site ID	Spring	Fall	Difference (%)
ID0020001U	7.6	6.8	-12
ID0020125D	21.6	6.9	-103
ID0020133U	9.9	3.7	-91
ID0020141U	3.9	2.0	-66
ID0020231D	1.4	9.1	146
ID0020451D	6.1	7.3	18
ID0020931U	4.6	6.9	41
ID0022845U	3.8	8.9	79
ID0025143D	21.5	4.6	-130
ID0027928U	2.0	1.9	-1
ID0027979U	0.9	4.3	129

Of the 90 minor discharge facilities that had both upstream and downstream locations that were sampleable, derived BLM criteria were higher at the downstream location for 48 sites, while the BLM criteria were lower at the downstream location for 42 sites. The mean percent difference between paired downstream and upstream samples was 0.08%.

DRAFT

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

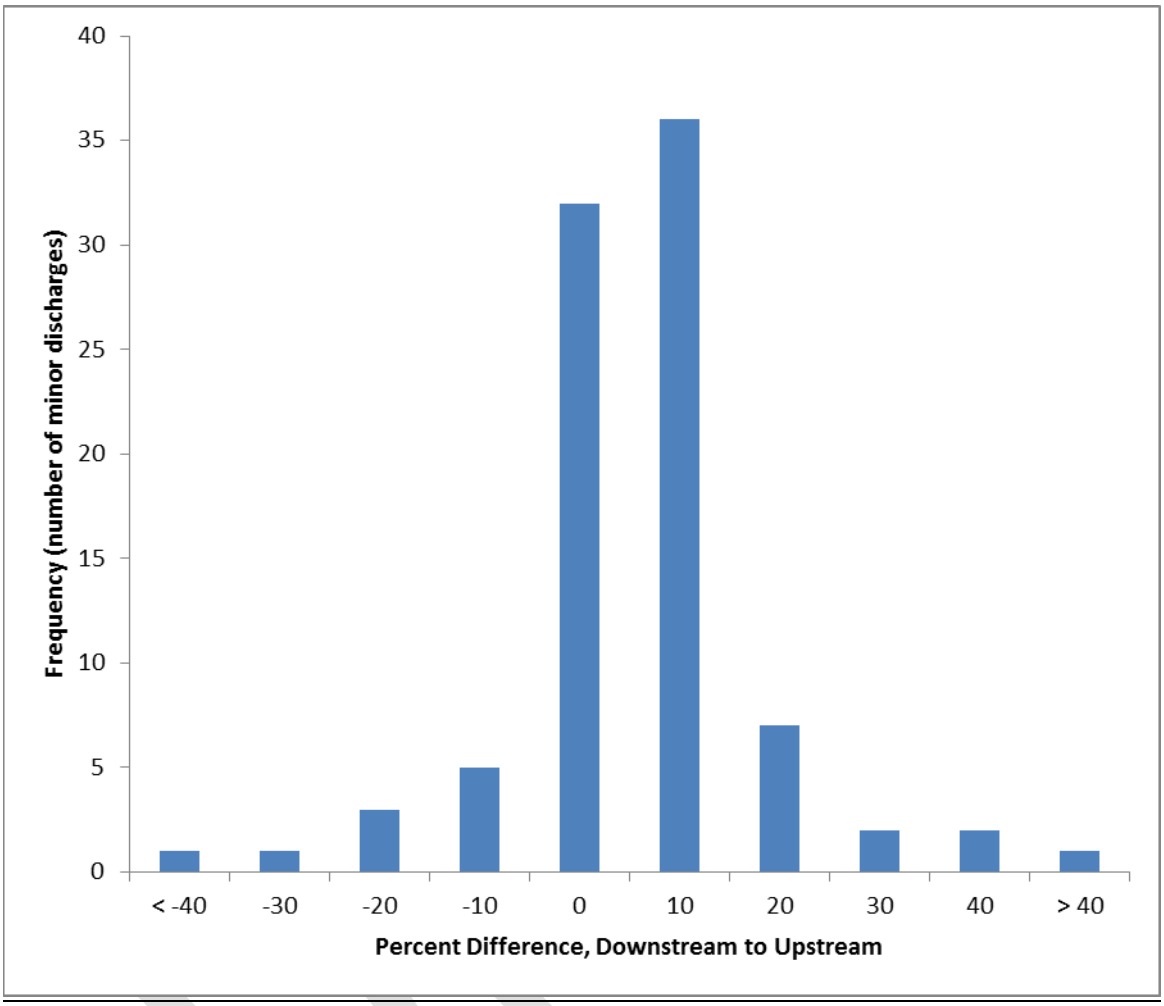


Figure 2. Histogram showing the distribution of the percent difference between paired downstream and upstream chronic BLM copper criteria from a given minor discharge location. Positive percent differences indicate downstream criteria were higher, while negative percent differences indicate upstream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

3.2 Copper Results

Only 5 of the 189 sites with complete samples had copper concentrations that exceeded BLM IWQC at the time of sampling. There were 2 sites that exceeded both acute and chronic criteria, and three sites that only exceeded chronic criteria (Table 8).

Table 8. BLM derived copper criteria and copper concentrations from the five sites that had copper results that exceeded the acute or chronic IWQC at the time of sample collection.

Site ID	Stream Name	Acute Criterion (µg/L)	Chronic Criterion (µg/L)	Dissolved Copper (µg/L)
ID0000167U	Canyon Creek	0.39	0.24	0.25
ID0027120D	Little Wood River	0.56	0.35	0.49
ID0028321D	Big Deer Creek	2.59	1.61	2.86
ID0028321U	Big Deer Creek	3.51	2.18	2.42
SFDeerCKD	South Fork Deer Creek	3.93	2.44	6.65

3.3 Regional Classification

Summary statistics (minimum, maximum, 10th percentile, mean, median, standards deviation, and coefficient of variation [CV]) for each input parameter and chronic copper criteria were calculated for each group for each regional classification scheme evaluated.

DRAFT

3.3.1 Basin

The number of sites sampled ranged from 12 in the Bear River Basin to 49 in the Southwest Basin. The distribution of input parameters by basin is presented in Figure 3~~Figure 2~~.

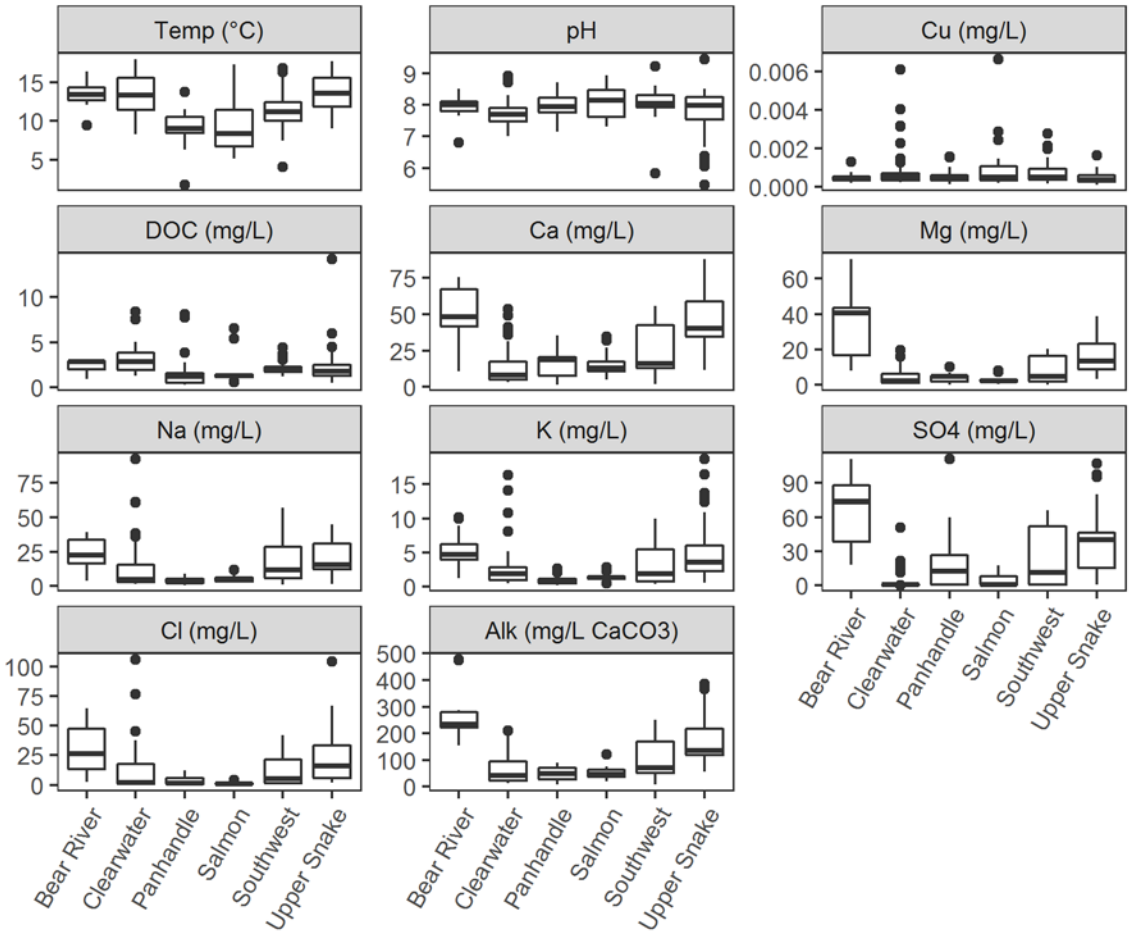


Figure 3. Distribution of BLM input parameters by basin.

Temperature CVs ranged from 13.3–42.1% in the Salmon Basin. The CV for pH ranged from 4.7–10.9%. The CV for dissolved Copper ranged from 61.6–140.5%. The CV for the ions (dissolved Calcium, Magnesium, Sodium, and Potassium, Sulfate and Chloride) and alkalinity ranged from 35.8–220.0%. The CV for DOC was 28.8–111.2%.

The distribution of derived chronic BLM criteria by basin is presented in Figure 4~~Figure 3~~.

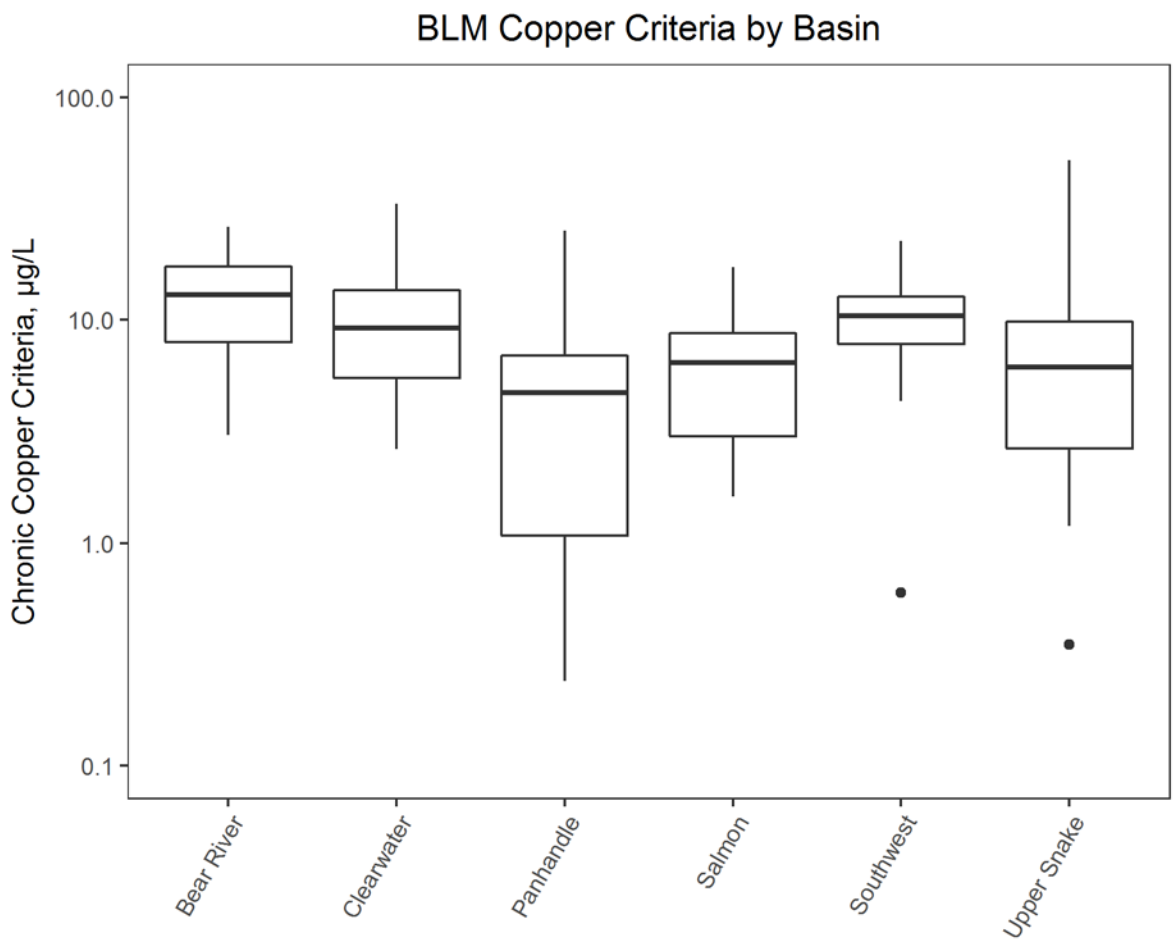


Figure 4. Distribution of BLM-derived chronic copper criteria by USGS hydrologic basin.

The lowest chronic copper criterion was in the Panhandle basin, while the highest was in the Upper Snake basin. The CV for chronic copper criteria ranged from a minimum of 40% in the Southwest basin to 113% in both the Panhandle and Upper Snake basins (Table 9).

Table 9. Summary statistics of BLM-derived chronic copper criteria by USGS hydrological basin.

Basin	N	Min (µg/L)	Max (µg/L)	10th %ile (µg/L)	Mean (µg/L)	SD (µg/L)	CV (%)
Bear River	12	3.0	26.1	4.9	13.6	7.25	53
Clearwater	40	2.6	33.2	4.7	10.4	6.21	60
Panhandle	37	0.2	25.1	0.7	5.5	6.17	113
Salmon	18	1.6	17.3	2.4	7.0	4.38	63
Southwest	49	0.6	22.7	5.8	10.5	4.17	40
Upper Snake	33	0.4	52.2	1.6	9.0	10.13	113

3.3.2 Level III Ecoregion

The number of sites ranged from 2 in the Wasatch and Uinta Mountains ecoregion to 58 in the Snake River Plain ecoregion. The Distribution of input parameters by Ecoregion are presented in

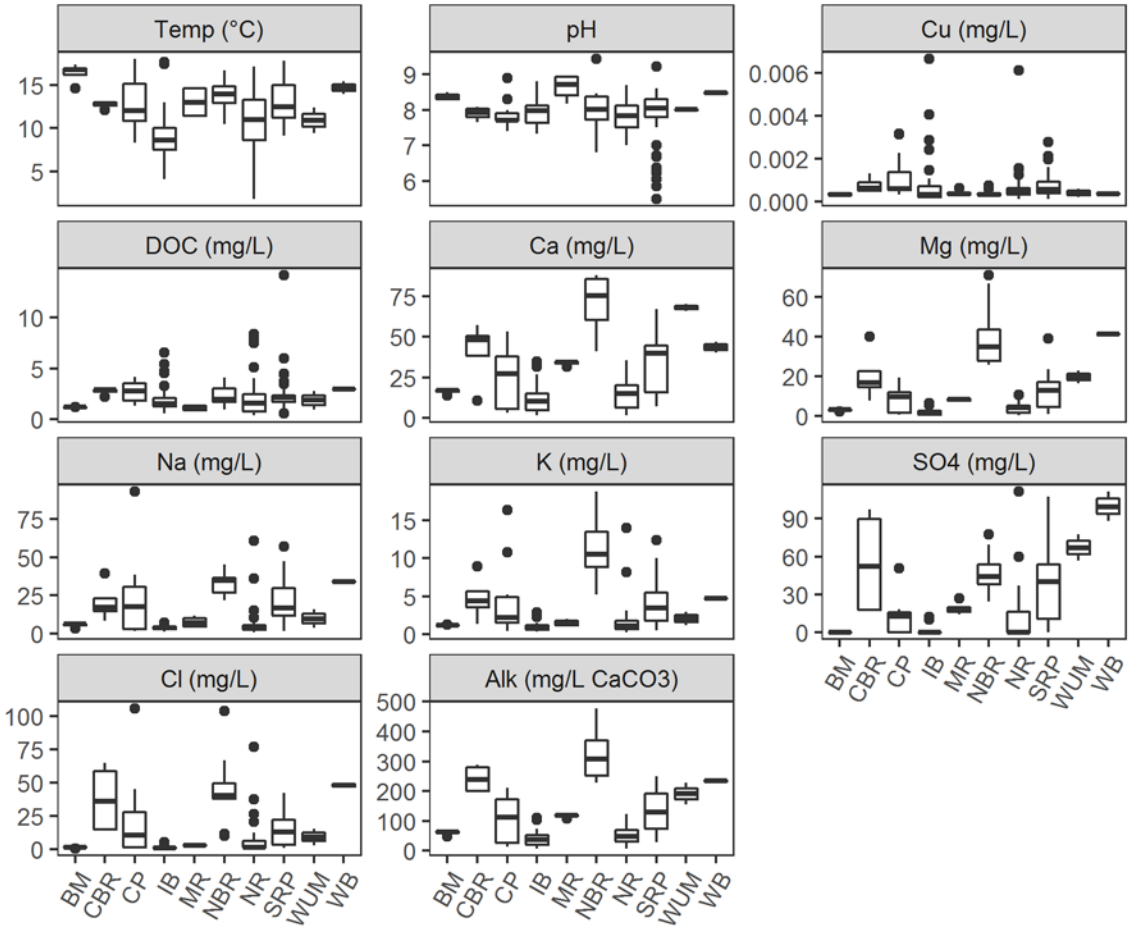


Figure 5. Distribution of BLM input parameters by Ecoregion. BM = Blue Mountains; CBR = Central Basin and Range; CP = Columbia Plateau; IB = Idaho Batholith; MR = Middle Rockies; NBR = Northern Basin and Range; NR = Northern Rockies; SRP = Snake River Plain; WUM = Wasatch and Uinta Mountains; WB = Wyoming Basin.

Temperature CVs ranged from 3.2–34.5% by ecoregion. The CV for pH ranged from 0.1–9.5%. The CV for dissolved copper ranged from 7.3–160.1%. The CV for the ions (dissolved calcium, magnesium, sodium, and potassium, sulfate, and chloride) and alkalinity ranged from 0.1–208.5%. The CV for DOC was 1.4–93.5%.

The distribution of derived chronic BLM criteria by Ecoregion is presented in Figure 6~~Figure 5~~.

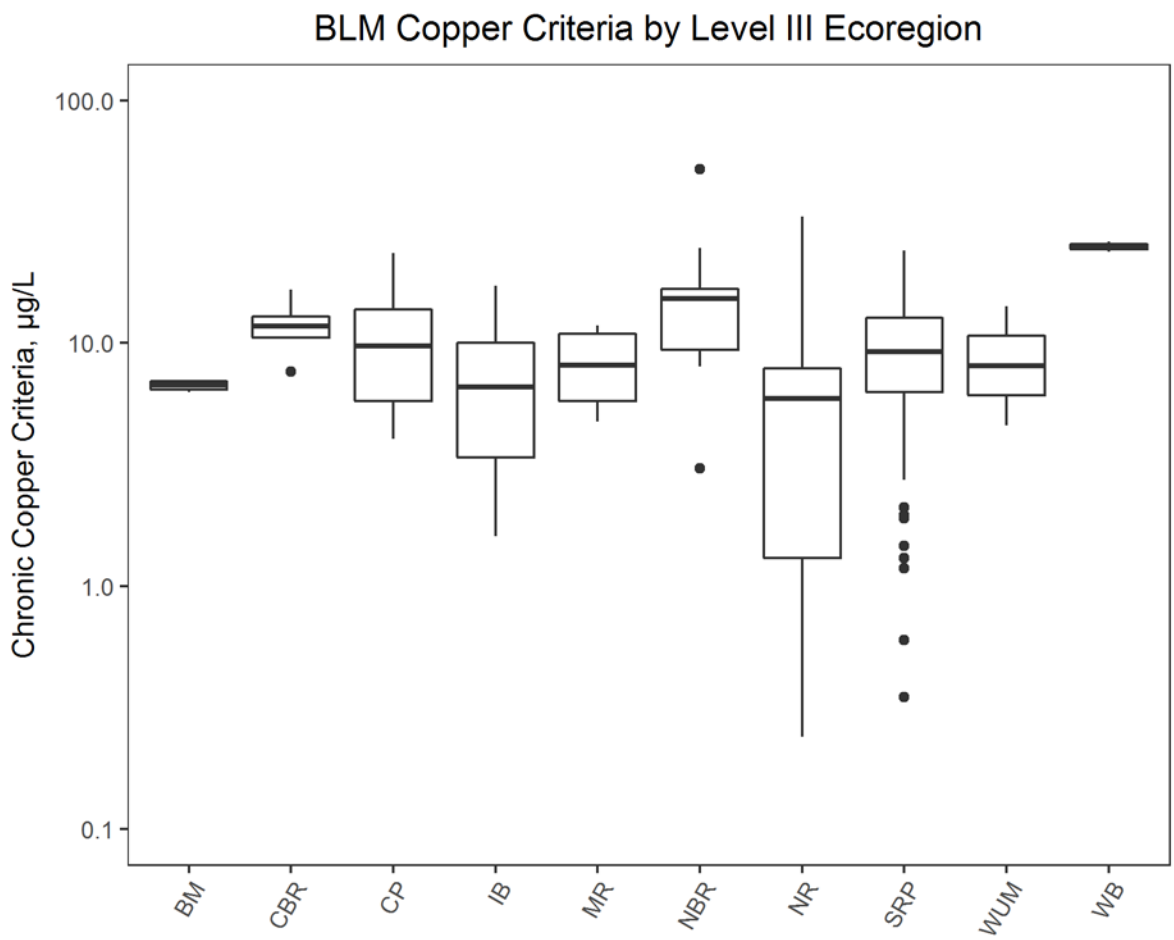


Figure 6. Distribution of BLM-derived chronic copper criteria by Ecoregion.

The lowest chronic copper criterion was in the Northern Rockies ecoregion, while the highest was in the Northern Basin and Range ecoregion. The CV for chronic copper criteria ranged from a minimum of 6% in the Blue Mountains ecoregion to 92% in the Northern Rockies ecoregion (Table 10).

Table 10. Summary statistics of BLM-derived chronic copper criteria by Ecoregion.

Ecoregion	N	Min (µg/L)	Max (µg/L)	10th %ile (µg/L)	Mean (µg/L)	SD (µg/L)	CV (%)
Blue Mountains	4	6.3	7.1	6.3	6.7	0.37	6
Central Basin and Range	4	7.7	16.6	8.9	11.9	3.65	31
Columbia Plateau	14	4.0	23.4	4.5	10.9	6.19	57
Idaho Batholith	32	1.6	17.3	2.4	7.3	4.26	58
Middle Rockies	4	4.7	11.8	5.2	8.3	3.43	41
Northern Basin and Range	12	3.0	52.2	8.1	16.4	12.67	77
Northern Rockies	57	0.2	33.2	0.9	6.9	6.74	97
Snake River Plain	58	0.4	24.0	2.0	9.7	5.50	57
Wasatch and Uinta Mountains	2	4.6	14.2	5.6	9.4	6.80	72
Wyoming Basin	2	23.7	26.1	24.0	24.9	1.70	7

DRAFT

3.3.3 Stream Order

The number of sites ranged from 7 in 8th order waters to 36 in 6th order waters, with 6 sites having unassigned stream order. The distribution of input parameters by stream order is presented in Figure 7~~Figure 6~~.

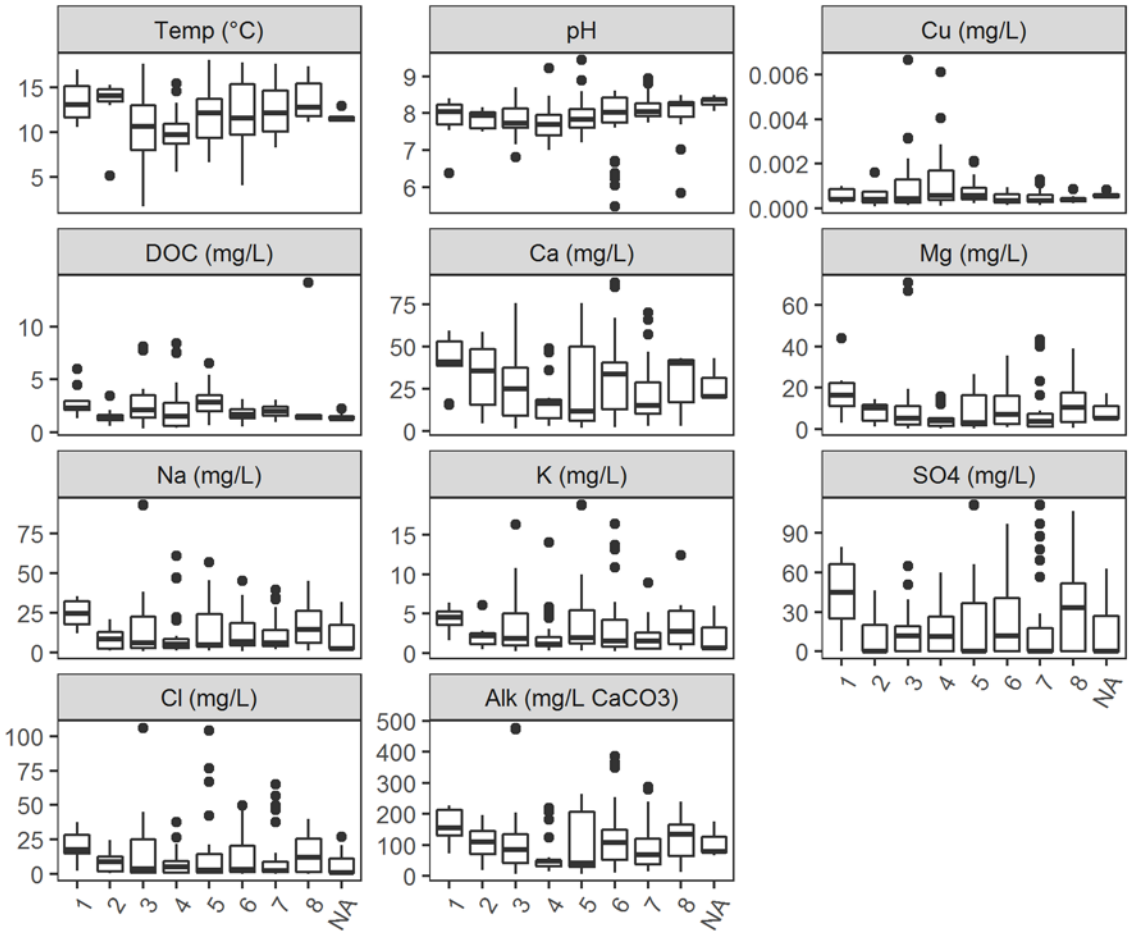


Figure 7. Distribution of BLM input paramaters by stream order. Some sites were located in non-flowing or manmade waters that do not have a stream order, indicated by NA.

Temperature CVs ranged from 5.2–36.3% by stream order. The CV for pH ranged was 1.8–10.9%. The CV for dissolved copper was 22.6–138.0%. The CV for the ions (dissolved calcium, magnesium, sodium, and potassium; sulfate; and chloride) and alkalinity was 33.4–175.9%. The CV for DOC was 26.9–141.8%.

The distribution of derived chronic BLM criteria by stream order is presented in Figure 8~~Figure 7~~.

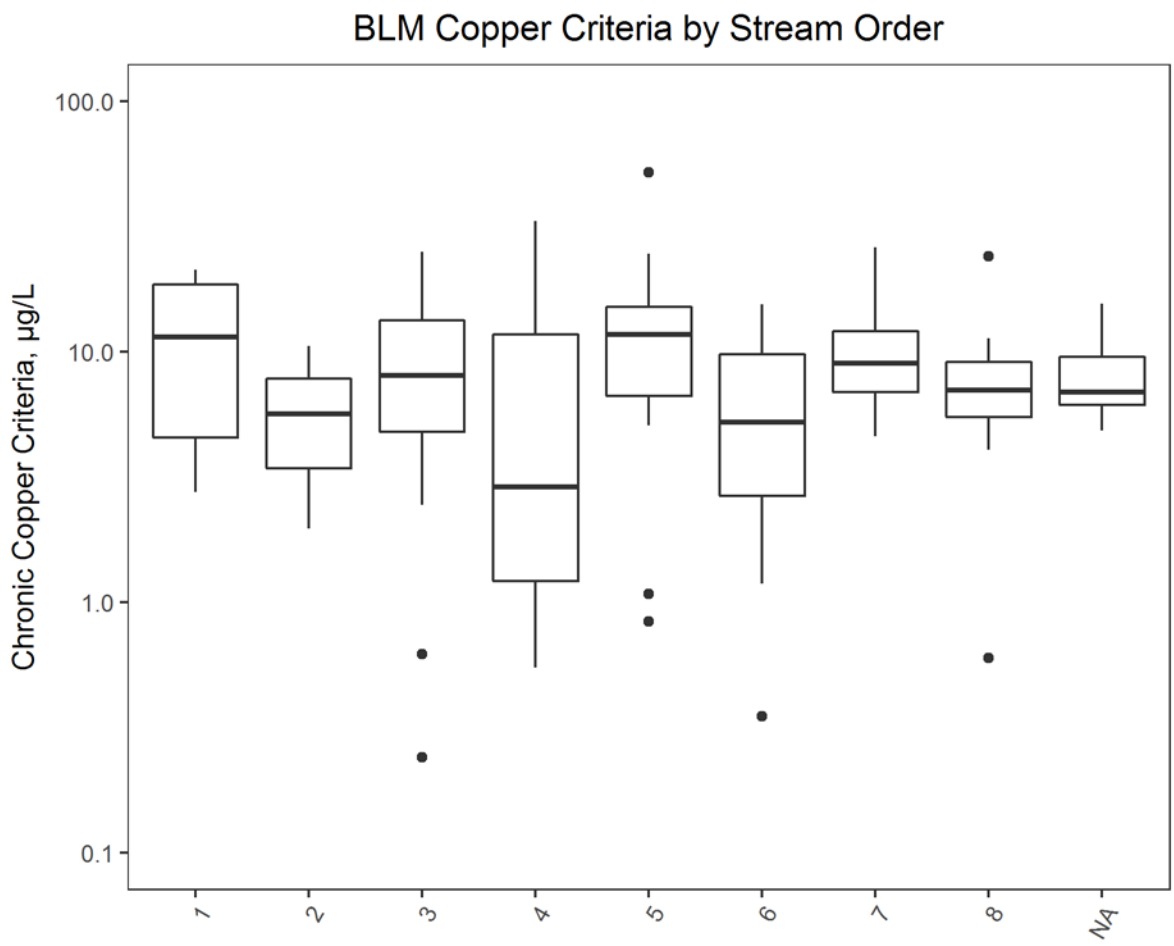


Figure 8. Distirbution of BLM-derived chronic copper criteria by stream order. Some sites were located in non-flowing or manmade waters that do not have a stream order, indicated by NA.

The lowest chronic copper criterion was in 3rd order water, while the highest was in 7th order water. The CV for chronic copper criteria ranged from 46% in 7th order and unassigned waters to 105% in 4th order waters (Table 11).

Table 11. Summary statistics for BLM-derived chronic copper criteria by stream order.

Stream Order	N	Min (µg/L)	Max (µg/L)	10th %ile (µg/L)	Mean (µg/L)	SD (µg/L)	CV (%)
1	8	2.7	21.2	3.2	11.9	8.1	68
2	23	2.0	10.5	2.3	5.8	3.0	52
3	31	0.2	25.1	2.5	10.1	7.5	74
4	31	0.6	33.2	1.0	6.9	7.5	105
5	29	0.8	52.2	5.5	12.4	9.3	75
6	36	0.4	15.5	1.4	6.6	4.6	69
7	18	4.6	26.1	6.3	10.5	4.8	46
8	7	0.6	24.0	4.7	7.9	4.9	61
Unassigned	6	4.8	15.5	5.6	8.4	3.9	46

DRAFT

3.3.4 Site Class

The number of sites ranged from 32 in the Foothills site class to 98 in PPBV site class. The distribution of input parameters by site class is presented in Figure 9~~Figure 8~~.

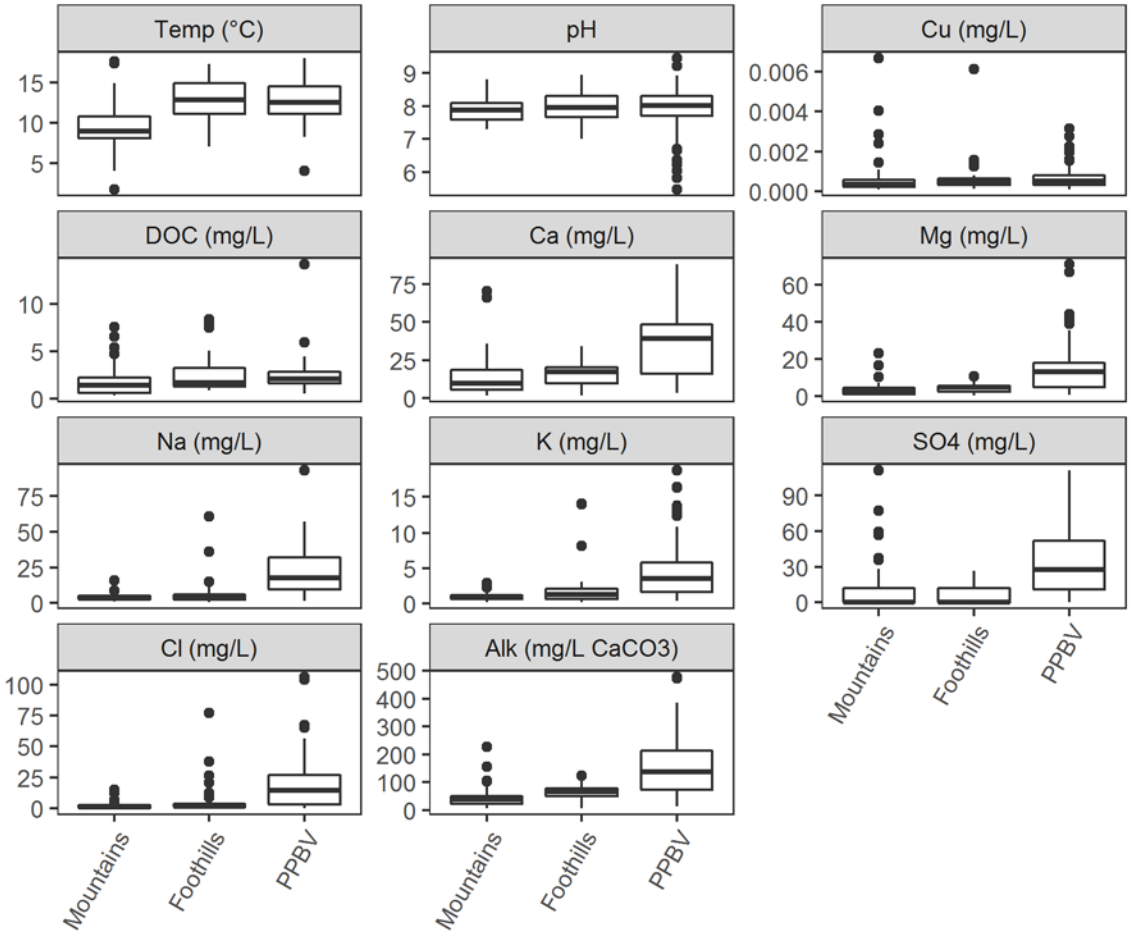


Figure 9. Distribution of BLM parameters by site class. PPBV = Plains, Plateaus, and Broad Valleys.

Temperature CVs ranged from 19.3–30.9% by site class. The CV ranged from 4.8–8.1%. The CV for dissolved copper was 87.0–155.6%. The CV for the ions (dissolved calcium, magnesium, sodium, and potassium; sulfate; and chloride) and alkalinity was 45.5–214.4%. The CV for DOC was 63.6–85.6%.

The distribution of derived chronic BLM criteria by site class is presented in Figure 10~~Figure 9~~.

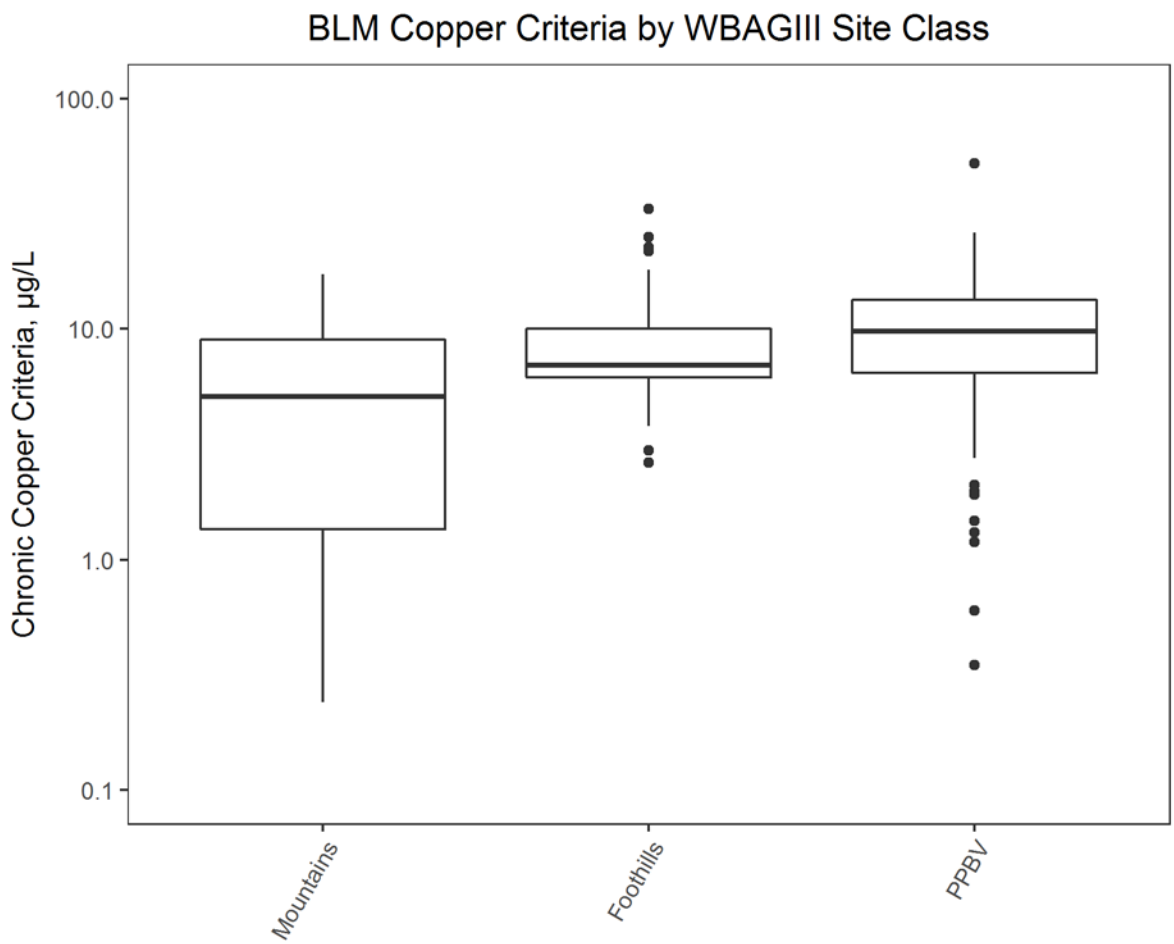


Figure 10. Distribution of BLM-derived chronic copper criteria by site class. PPBV = Plains, Plateaus, and Broad Valleys.

The lowest chronic criterion was in the Mountain site class, while the highest was in the PPBV site class. The CV for chronic copper criteria ranged from a minimum of 67% in the PPBV to 80% in the Mountains.

Table 12. Summary statistics for BLM-derived chronic copper criteria by site class.

DEQ Site Classes	N	Min	Max	10th %ile	Mean	Std Dev	CV
Mountains	59	0.2	17.3	0.9	5.8	4.70	80
Foothills	32	2.6	33.2	3.9	9.7	7.13	73
PPBV	98	0.4	52.2	3.3	10.8	7.23	67

3.3.5 Site Class + River/Stream

The number of sites ranged from 10 in Foothills Streams to 69 in PPBV Rivers. The distribution of input parameters by 1.1.1 Site Class + River/Stream designations is presented in Figure 11~~Figure 10~~.

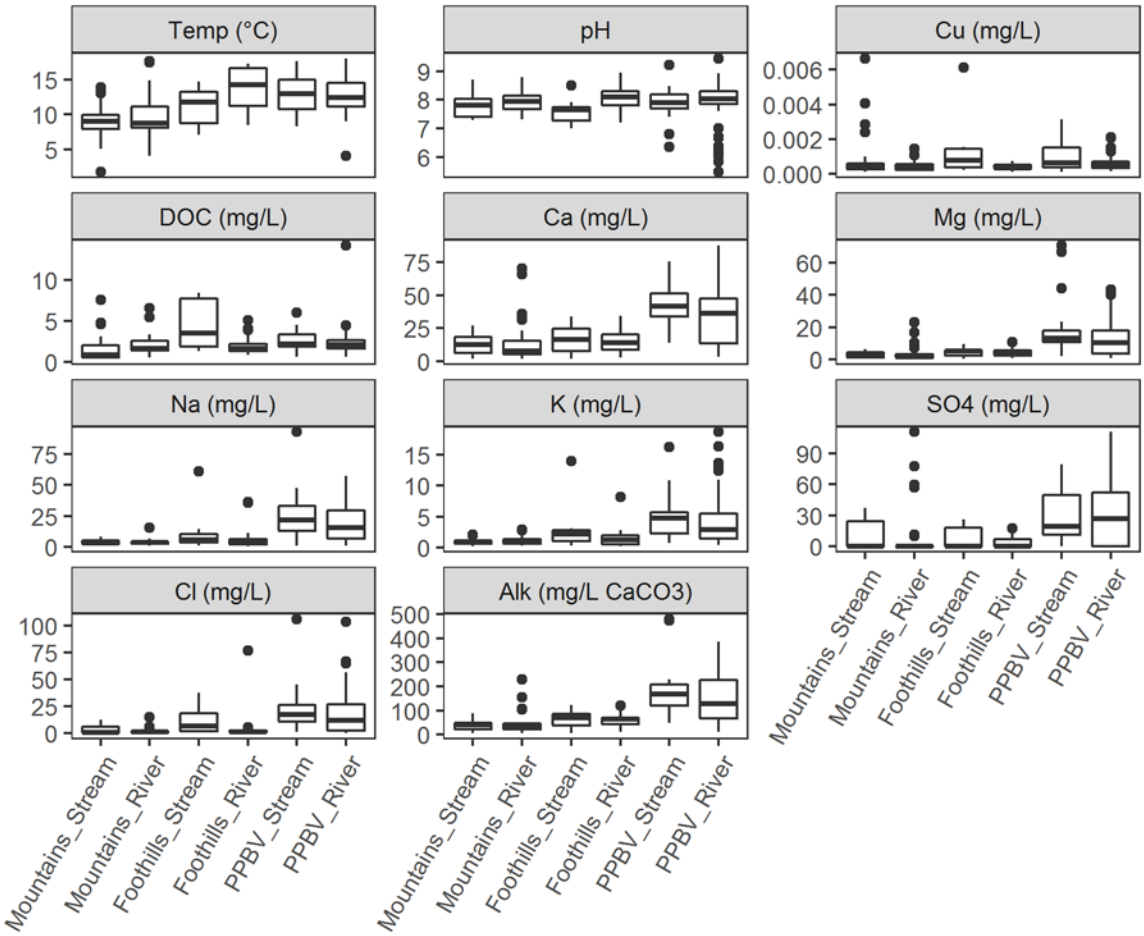


Figure 11. Distribution of BLM input parameters by Site Class + River/Stream designation. For purposes of this classification scheme, rivers are any water with stream order ≥5, while streams are any water with stream order <5.

Temperature CVs ranged from 18.6–32.0%. The CV for pH ranged from 4.5–8.76%. The CV for dissolved copper ranged from 39.7–158.2%. The CV for the ions (dissolved calcium, magnesium, sodium and potassium; sulfate; and chloride) and alkalinity ranged from 41.6–299.1%. The CV for DOC was 46.8–104.9%.

The distribution of derived chronic BLM criteria by Site Class + River/Stream designation is presented in Figure 12~~Figure 11~~.

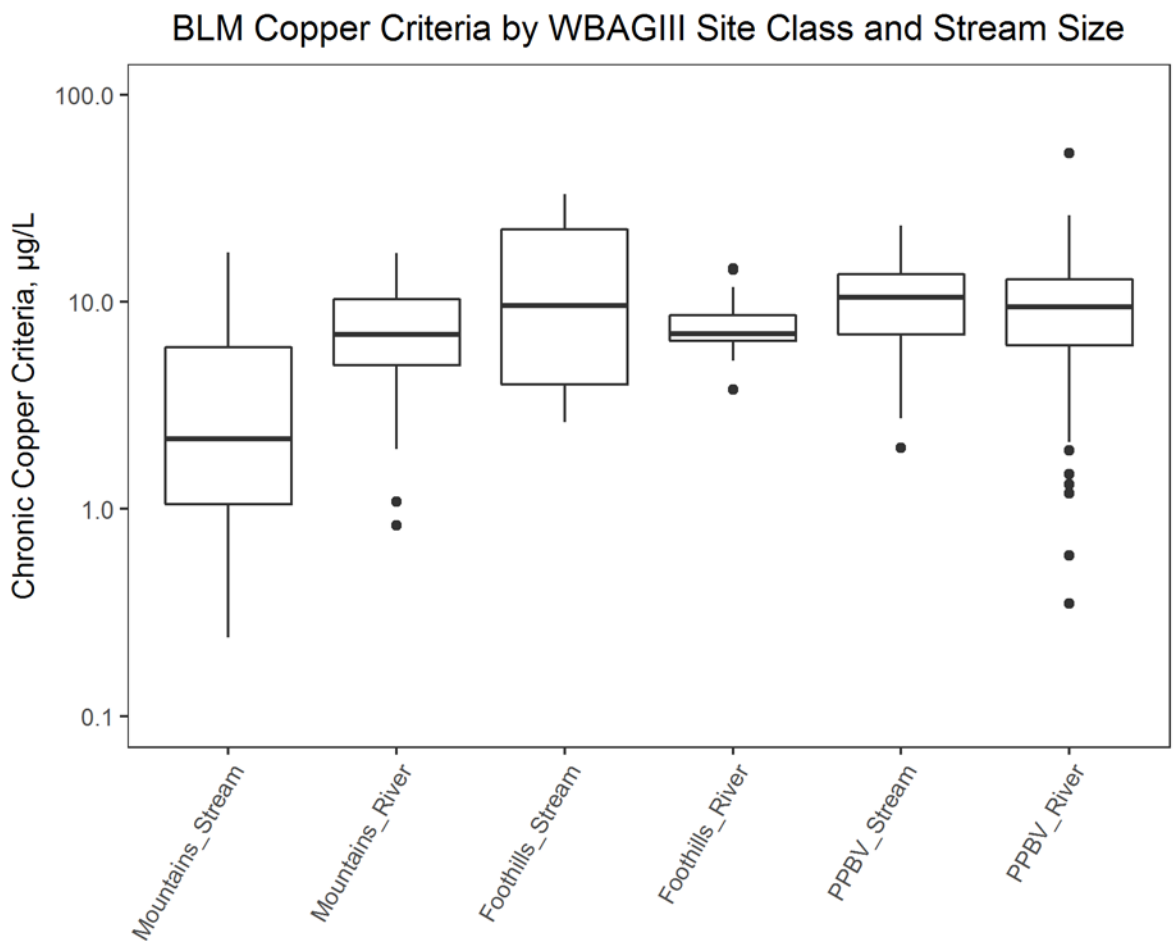


Figure 12. Distribution of BLM-derived chronic copper criteria by Site Class + River/Stream.

The lowest chronic copper criterion was in the Mountains Stream class, while the highest was in the PPBV River class. The CV for chronic copper criteria ranged from a minimum of 36% in the Foothills River to 106% in the Mountains Stream class (Table 13).

Table 13 Summary statistics of BLM-derived chronic copper criteria by Site Class + River/Stream.

DEQ Site Class and River or Stream Designation	N	Min	Max	10th %ile	Mean	Std Dev	CV
Foothills River	18	3.8	14.5	6.0	8.0	2.88	36
Foothills Stream	10	2.6	33.2	2.9	14.0	11.37	81
Mountains River	27	0.8	17.3	2.4	7.9	4.41	56
Mountains Stream	31	0.2	17.3	0.6	4.1	4.36	106
PPBV River	69	0.4	52.2	3.1	10.7	7.80	73
PPBV Stream	27	2.0	23.4	3.4	10.9	5.92	54

The distribution of CVs calculated for all BLM input parameters by regional classification system is presented in Figure 13~~Figure 12~~.

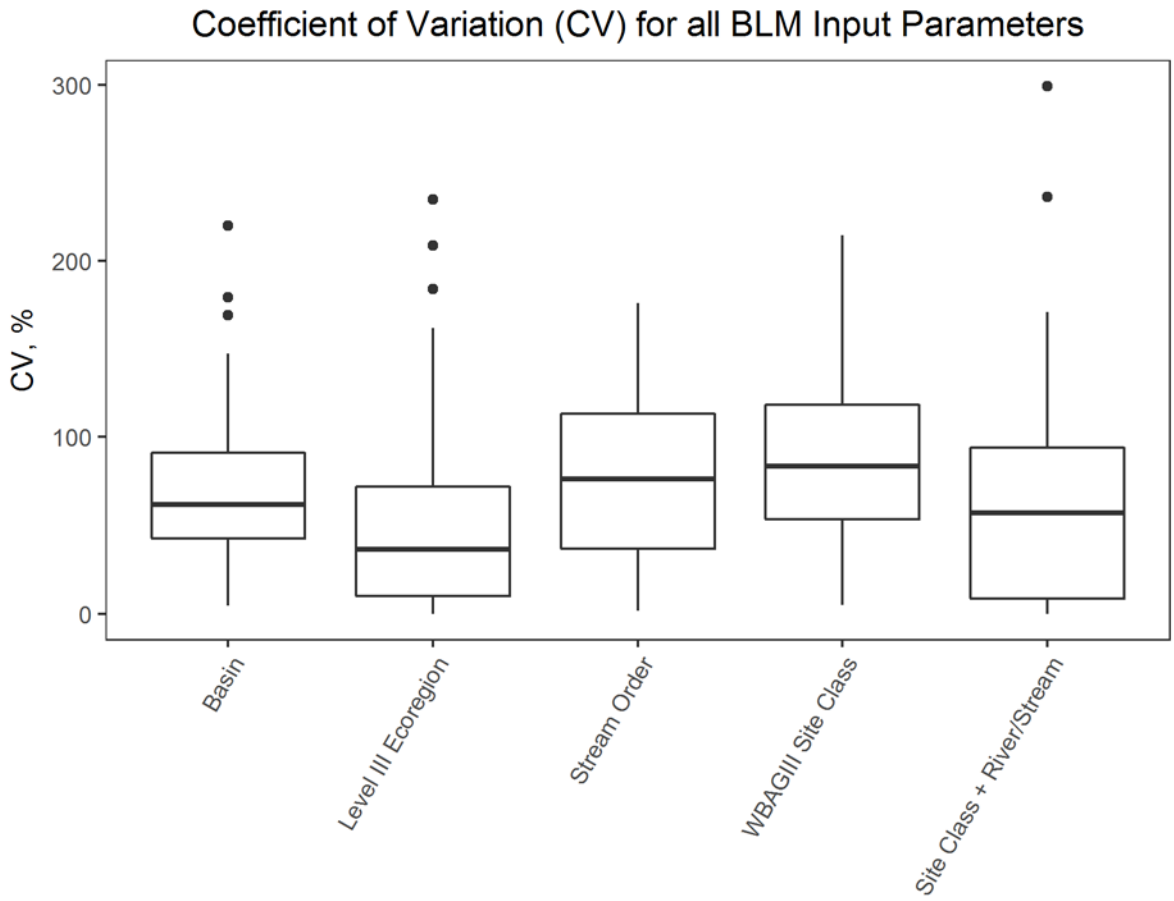


Figure 13. Distribution of calculated coefficient of variation for all BLM input parameters by site class system.

Summary statistics of CVs for all BLM inputs are presented in Table 14.

Table 14. Minimum, maximum, 10th percentile, 90th percentile, mean, and median of calculated coefficients of variation (CV) for all BLM input parameters.

Regional Classification System	Min	Max	10th %ile	90th %ile	Mean	Median
Basin	5	220	15	128	70	62
Ecoregion	0	235	3	99	48	37
Stream Order	2	176	15	143	77	76
Site Class	5	214	20	157	86	83
Site Class + River/Stream	0	299	3	132	61	57

4 Discussion

Fall and spring monitoring confirmed the high spatial and temporal variability of both BLM input parameters and the derived BLM criteria. Variability, measured as the coefficient of variation, was lowest for temperature and pH, and greatest for the major ions (Table 6).

Five of the 189 sites with complete samples and derived BLM criteria had copper concentrations that exceeded the acute or chronic BLM IWQC at the time of sampling (Table 8). Three of these five sites—ID0028321D, ID0028321U, and SFDeerCKD—are located in waters that are already considered to be impaired by copper and are under active remediation for copper and other metals as part of the Blackbird Mine Superfund site.

The other two sites, ID0000167U and ID0027120D, had BLM IWQCs and copper concentrations that were less than half the reporting limit for copper (Table 2), meaning that while there is certainty that there was dissolved copper present in the sample, the result cannot be quantified with any confidence.

4.1 Laboratory Processing

Collection and quantification of DOC from surface water is often difficult and obtaining reliable results can be problematic (see http://www.deq.idaho.gov/media/60179624/58-0102-1502-mebane-comment-1216.pdf). However, QC results from this project indicate that many of the problems associated with meeting precision requirements from field replicates can be allayed by filtering samples in an analytical laboratory as opposed to in the field, as is required by 40 CFR 136 for National Pollutant Discharge Elimination System (NPDES) compliance monitoring. Field replicate RPD range for DOC samples for this project was 1.2–2.5%.

4.2 Estimating Conservative Criteria

Conservative criteria can be estimated for regional classification systems by looking at a lower percentile of the distribution of BLM criteria for a site class, such as the minimum or the 10th percentile.

For example, Table 15 presents potential conservative criteria estimates based on the 10th percentile for each of the regional classification systems described in Section 3.3. These conservative criteria estimates are lower than the calculated IWQC for all but 6 of the 189 sampled sites.

4.2.1 Comparison to Other Datasets

Independent data for developing BLM criteria at sites in Idaho are rare. However, the USGS does have data available from some sites throughout Idaho where complete BLM data are available (USGS, 2016).

Table 15. Potential conservative criteria estimates. Values represent the 10th percentile of BLM criteria derived from statewide monitoring.

Estimated copper criteria			
		10th percentile (µg/L)	
Regional Classification		Acute	Chronic
Basins			
	Bear River	7.9	4.9
	Clearwater	7.6	4.7
	Panhandle	1.1	0.7
	Salmon	3.9	2.4
	Southwest	9.3	5.8
	Upper Snake	2.6	1.6
Ecoregion			
	Blue Mountains	10.1	6.3
	Central Basin and Range	14.3	8.9
	Columbia Plateau	7.2	4.5
	Idaho Batholith	3.9	2.4
	Middle Rockies	8.4	5.2
	Northern Basin and Range	13.0	8.1
	Northern Rockies	1.4	0.9
	Snake River Plain	3.2	2.0
	Wasatch and Uinta Mountains	9.0	5.6
	Wyoming Basin	38.6	24.0
Stream Order			
	1	5.2	3.2
	2	3.7	2.3
	3	4.0	2.5
	4	1.6	1.0
	5	8.9	5.5
	6	2.3	1.4
	7	10.1	6.3
	8	7.6	4.7
	Unassigned	9.0	5.6
Site Class			
	Mountains	1.4	0.9
	Foothills	6.3	3.9
	PPBV	5.3	3.3
Site Class + River/Stream			
	Foothills River	9.7	6.0
	Foothills Stream	4.7	2.9
	Mountains River	3.9	2.4
	Mountains Stream	1.0	0.6
	PPBV River	5.0	3.1
	PPBV Stream	5.5	3.4

Table 16~~Table 15~~ presents a comparison of how minimum and 10th percentile values calculated for regional site classification systems based on fall monitoring data compare to the actual minimum IWQCs calculated from 9 USGS monitoring locations where complete BLM data are available.

DRAFT

In most instances, criteria that represent the most bioavailable condition measured can be estimated by taking the 10th percentile of chronic criteria from one of the site classification systems.

Furthermore, if we take into account reporting limits, and consider the reporting limit to be the effective criteria for waters where the BLM-derived criteria are below the reporting limit for dissolved copper, then the minimum of the regional classification 10th percentile values would be considered protective for each site where we have independent BLM criteria.

For example, both USGS site 12413000 and site 12413470 had a minimum chronic copper criterion of 0.6 µg/L. The minimum 10th percentile regional site classification system estimate for these sites is based on the Site Class system (Mountains), and is 0.9 µg/L. Although this is greater than the minimum calculated criterion of 0.6 µg/L, if we consider our ability to measure dissolved copper, these concentrations could be considered equivalent when determining compliance (Table 2, Table 16~~Table 15~~).

A comparison of the 10th percentile chronic BLM criteria estimates to actual IWQCs at USGS sites with complete BLM data can be found in Appendix D.

DRAFT

Table 16. Comparison of minimum chronic copper criterion measured at USGS sites to regional conservative criteria estimates based on minimum and 10th %ile values. Values in bold indicate the estimate is below the minimum measured.

USGS Site ID	**10068500**	**12392155**	**12413000**	**12413470**	**12413875**	**12419000**	**13056500**	**13092747**	**13154500**
USGS Site Name	**Bear River at Pescadero**	**Lightning Creek at Clark Fork, Idaho**	**North Fork Coeur d'Alene at Enaville**	**South Fork Coeur d'Alene at Pinehurst**	**St Joe at Red Ives**	**Spokane near Post Falls**	**Henry's Fork near Rexburg**	**Rock Creek above highway 30/93 crossing, Twin Falls**	**Snake River at King Hill**
Min Chronic criteria	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	8.9	1.1	0.6	0.6	3.7	1.5	4.1	10.7	4.9
Basin	Bear River	Panhandle	Panhandle	Panhandle	Panhandle	Panhandle	Upper Snake	Upper Snake	Southwest
min	**3.0**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.4**	**0.4**	**0.6**
10th %ile	**4.9**	**0.7**	0.7	0.7	**0.7**	**0.7**	**1.6**	**1.6**	5.8
Level III Ecoregion	Wyoming Basin	Northern Rockies	Northern Rockies	Northern Rockies	Northern Rockies	Northern Rockies	Snake River Plain	Snake River Plain	Snake River Plain
min	23.7	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.4**	**0.4**	**0.4**
10th %ile	24	**0.9**	0.9	0.9	**0.9**	**0.9**	**2.0**	**2.0**	**2.0**
Stream Order	6th	4th	5th	5th	4th	7th	6th	5th	7th
min	**0.4**	**0.6**	0.8	0.8	**0.6**	4.6	**0.4**	**0.8**	**4.6**
10th %ile	**1.4**	**1**	5.5	5.5	**1**	6.3	**1.4**	**5.5**	6.3
WBAGIII Site Class	PPBV	Foothills	Mountains	Mountains	Mountains	Foothills	PPBV	PPBV	PPBV
min	**0.4**	2.6	**0.2**	**0.2**	**0.2**	2.6	**0.4**	**0.4**	**0.4**
10th %ile	**3.3**	3.9	0.9	0.9	**0.9**	3.9	**3.3**	**3.3**	**3.3**
WBAGIII Site Class + River/Stream	PPBV River	Foothills Stream	Mountains River	Mountains River	Mountains River	Foothills River	PPBV River	PPBV River	PPBV River
min	**0.4**	2.6	0.8	**0.8**	**0.8**	3.8	**0.4**	**0.4**	**0.4**
10th %ile	**3.1**	2.9	2.4	2.4	**2.4**	6	**3.1**	**3.1**	**3.1**

DRAFT

Similarly, although not all spring samples resulted in higher chronic copper criteria than the fall samples collected at the same locations (Table 7), application of the minimum estimated criteria by regional classification system for each site would provide criteria that are lower than the lowest criteria derived from measured inputs (Table 17~~Table 16~~).

DRAFT

Table 17. Comparison of spring copper criterion measured at sites where spring BLM criteria were lower than fall criteria, compared to regional conservative criteria estimates based on 10th %ile values. Values in bold indicate the estimate is below the minimum measured.

Site ID	Spring chronic copper criterion (µg/L)	Basin 10th %ile criterion (µg/L)	Level III Ecoregion 10th %ile criterion (µg/L)	Stream Order 10th %ile criterion (µg/L)	WBAGIII Site Class 10th %ile criterion (µg/L)	WBAGIII Site Class+ River/Stream 10th %ile criterion (µg/L)
ID0020231D	1.4	5.8	2.4	5.5	**0.9**	2.4
ID0020451D	6.1	**0.7**	**0.9**	6.3	**3.9**	**6.0**
ID0020931U	4.6	**2.4**	6.3	4.7	**3.9**	6.0
ID0022845U	3.8	**0.7**	**0.9**	**1.4**	**0.9**	**2.4**
ID0027979U	0.9	5.8	2.4	1.4	**0.9**	2.4

DRAFT

4.3 Effects of Point Source Discharges on BLM Criteria

While point source discharges to surface waters can have significant effects on receiving water quality and BLM input parameters, our results indicate that these changes are relatively insignificant and are unlikely to bias estimates of conservative criteria (Section 3.1; Figure 2).

4.4 Effects of Blank Correction for DOC

Samples that were affected by DOC blank corrections (Section 2.5.2) could potentially bias resulting BLM derived criteria estimates. Blank correction, where the concentration of an analyte detected in a blank sample is subtracted from the results of the analysis batch, is a common laboratory procedure and is used to ensure accurate analytical results. While field blank correction is less common, it has been found to be effective for dealing with the difficulties of DOC contamination. For example, Brumbaugh (2014) found that blank correction improved DOC results agreement and comparability in an interlaboratory comparison of DOC sample analysis.

Another option for reconciling data affected by detectable DOC in blanks is to remove all affected samples from the analysis. Removing these 16 samples from analysis would reduce the N of samples used in regional classification analysis for the Panhandle Basin; Northern Rockies Ecoregion; 2nd, 3rd, and 4th stream orders; Mountains Site Class; and Mountains River Site Class + River/Stream regional classifications accordingly (see Section 3.3). The number of sites affected for each regional classification is presented in Table 18. Regional classifications affected by removal of 16 samples affected by detectable DOC in sample blanks.Table 18.

DRAFT

Table 18. Regional classifications affected by removal of 16 samples affected by detectable DOC in sample blanks.

Regional Classification		Number Samples Removed
Basin		
	Panhandle	16
Level III Ecoregion		
	Northern Mountains	16
Stream Order		
	2nd	2
	3rd	12
	4th	2
Site Class		
	Mountains	16
Site Class + River/Stream		
	Mountains / River	16

If the 16 samples affected by blanks with detectable DOC concentrations are removed from the analysis, 8 of the 34 regional classifications would be affected (Table 18), subsequently leading to higher 10th percentile values for BLM derived copper criteria (Table 19)

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	10th %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

DRAFT

While removing results from samples affected by detectable DOC blanks would reduce the likelihood of bias, it would have the additional effect of changing criteria estimates into values that might not be protective in waters in northern Idaho.

For example, the minimum BLM based chronic copper criterion for Lightning Creek at Clark Fork, Idaho, was 1.1 µg/L. With blank correction, the lowest 10th percentile conservative criterion estimate was 0.7 µg/L in the Panhandle Basin. However, removing data affected by blank correction would increase the lowest estimate to 2.5 µg/L, resulting in criteria estimates that would not be protective of the most bioavailable conditions at that location (Table 16).

5 Conclusion

To ensure that a regional classification system is appropriate, it must have sufficient sites to make it likely that critical conditions are represented and that the estimated criteria are not under protective, and it must have relatively low variability to ensure that estimated criteria are not over protective.

Ecoregions have relatively low variability in BLM input parameters (Figure 13~~Figure 12~~, Table 14), as well as in chronic copper criteria. However, some ecoregions are represented by relatively few sites (Table 10).

Site Classes provide the benefit of having only three site classes and relatively low variability in chronic copper criteria (Table 12). However, BLM input parameter variability is relatively high compared to other classification systems (Figure 13~~Figure 12~~).

Site Class + River/Stream regional classification system provides a good balance of relatively low variability in BLM input parameters (Figure 13~~Figure 12~~, Table 14) and sites represented per classification (Table 13).

Although no single regional classification system provided consistently lower criteria estimates, data indicate that protective conservative criteria can be estimated at any site by taking the lowest of the 10th percentile criteria calculated from the five regional site classes.

DRAFT

DRAFT

References

Brumbaugh, WG. 2014. "Results From U.S. Geological Survey Columbia River Research Center and University of Saskatchewan Interlaboratoy Comparison of Analyses for Dissolved Organic Carbon in Water Samples." In *Acute and Chronic Sensitivity of White Sturgeon* (Acipenser transmontanus) *and Rainbow Trout* (Oncorhynchus mykiss) *to Cadmium, Copper, Lead, or Zinc in Laboratory Water-Only Exposures*, Appendix 7. Reston, VA: U.S. Geological Survey.

DEQ (Idaho Department of Environmental Quality). 2016a. *Quality Assurance Project Plan (QAPP) Statewide Monitoring for Inputs to the Copper Biotic Ligand Model (BLM).* Boise, ID: DEQ.

DEQ (Idaho Department of Environmental Quality). 2016b. *Water Body Assessment Guidance: 3rd Edition.* Boise, ID: DEQ. Available at: *http://www.deq.idaho.gov/media/60179244/water-body-assessment-guidance.pdf*.

EPA (U.S. Environmental Protection Agency). 2013. *Level III ecoregions of the continental United States.* Corvallis, Oregon: U.S. EPA - National Health and Environmental Effects Research Laboratory. ftp://ftp.epa.gov/wed/ecoregions/us/Eco_Level_III_US.pdf

U.S. Geological Survey, 2016, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed May 25, 2017, at URL http://waterdata.usgs.gov/nwis/.

DRAFT

Appendix A. Monitoring Locations

DRAFT

Site ID	Water Body Name	Latitude	Longitude	Stream Order	BASIN
ID0000060D	South Fork Coeur d'Alene River	47.515726	-116.026546	4	Panhandle
ID0000060U	South Fork Coeur d'Alene River	47.5111	-116.015106	4	Panhandle
ID0000159D	South Fork Coeur d'Alene River	47.515765	-116.026424	4	Panhandle
ID0000159U	South Fork Coeur d'Alene River	47.511057	-116.015071	4	Panhandle
ID0000167D	Canyon Creek	47.518162	-115.826794	3	Panhandle
ID0000167U	Canyon Creek	47.523335	-115.804234	3	Panhandle
ID0000213D	Payette River	44.08218	-116.951	7	Southwest
ID0000213U	Forty-nine Slough	44.07064	-116.93891	3	Southwest
ID0000388D	Rock Creek	42.5337	-114.4519	6	Upper Snake
ID0000388U	Rock Creek	42.5321	-114.4413	6	Upper Snake
ID0001155D	Snake River	44.24546	-116.9814	NA	Southwest
ID0001155U		44.22164	-116.98206	1	Southwest
ID0001198D	Soda Creek	42.67949	-111.60477	3	Bear River
ID0001198U	Soda Creek	42.7027	-111.6119	3	Bear River
ID0020001D	Salmon River	45.19766	-113.88321	7	Salmon
ID0020001U	Salmon River	45.18774	-113.89179	7	Salmon
ID0020010D		43.70391	-111.94346	2	Upper Snake
ID0020010U	Dry Bed	43.70324	-111.91339	2	Upper Snake
ID0020036D	Threemile Creek	45.9427	-116.1086	3	Clearwater
ID0020036U		43.9358	-116.115	2	Southwest
ID0020061D		42.5935	-114.6314	1	Upper Snake
ID0020061U		42.57948	-114.63026	1	Upper Snake
ID0020087D	Weiser River	44.69212	-116.46835	6	Southwest
ID0020087U	Weiser River	44.73202	-116.44953	5	Southwest
ID0020117D	South Fork Coeur d'Alene River	47.548656	-116.222499	5	Panhandle
ID0020117U	South Fork Coeur d'Alene River	47.547933	-116.174871	5	Panhandle
ID0020125D	Cow Creek	46.5369	-116.9474	4	Clearwater
ID0020125U	Cow Creek	46.5467	-116.9283	4	Clearwater
ID0020133D	Snake River	43.37943	-112.16838	8	Upper Snake

DRAFT

Site ID	Water Body Name	Latitude	Longitude	Stream Order	BASIN
ID0020133U		43.31446	-112.15069	1	Upper Snake
ID0020141D	Woods Creek	43.71952	-111.1304	2	Upper Snake
ID0020141U	Woods Creek	43.72236	-111.12591	2	Upper Snake
ID0020206D	Orofino Creek	46.4931	-115.8057	5	Clearwater
ID0020206U	Orofino Creek	46.4908	-115.8009	5	Clearwater
ID0020222D	Kootenai River	48.700673	-116.350134	7	Panhandle
ID0020222U	Kootenai River	48.696432	-116.326528	7	Panhandle
ID0020231D	North Fork Payette River	44.89125	-116.10965	5	Southwest
ID0020231U	North Fork Payette River	44.8979	-116.11332	5	Southwest
ID0020249D	Portneuf River	42.79186	-112.25204	6	Upper Snake
ID0020249U	Portneuf River	42.7822	-112.2313	6	Upper Snake
ID0020311D	Payette River	43.86983	-116.56841	7	Southwest
ID0020311U	Payette River	43.88186	-116.50546	7	Southwest
ID0020338D	Snake River	44.02511	-116.93455	NA	Southwest
ID0020338U		43.9976	-116.94984	3	Southwest
ID0020354D	Jim Ford Creek	46.3832	-115.9492	5	Clearwater
ID0020354U	Jim Ford Creek	46.3758	-115.9412	4	Clearwater
ID0020362D	Elk Creek	46.7832	-116.171	4	Clearwater
ID0020362U	Elk Creek	46.7869	-116.1736	4	Clearwater
ID0020389D	Payette River	43.99702	-116.80302	7	Southwest
ID0020389U	Payette River	43.99009	-116.79641	7	Southwest
ID0020401D	Henrys Fork	43.94997	-111.71759	7	Upper Snake
ID0020401U	Henrys Fork	43.95734	-111.70393	7	Upper Snake
ID0020427D	Snake River	43.66218	-116.96336	8	Southwest
ID0020427U	Snake River	43.63369	-116.95025	8	Southwest
ID0020451D	Kootenai River	48.700932	-116.350472	7	Panhandle
ID0020451U	Kootenai River	48.696514	-116.326553	7	Panhandle
ID0020532D	Palouse River	46.909	-116.8329	5	Clearwater
ID0020532U	Palouse River	46.9188	-116.7666	5	Clearwater

DRAFT

Site ID	Water Body Name	Latitude	Longitude	Stream Order	BASIN
ID0020567D	Big Creek	47.510318	-116.071676	4	Panhandle
ID0020567U	Big Creek	47.503762	-116.071701	4	Panhandle
ID0020681D	Pend Oreille River	48.185321	-117.032602	NA	Panhandle
ID0020681U		48.177035	-116.997319	NA	Panhandle
ID0020699D	Red River	45.7197	-115.3751	5	Clearwater
ID0020699U	Red River	45.7109	-115.337	4	Clearwater
ID0020711D	Selway River	46.1016	-115.5596	7	Clearwater
ID0020711U	Selway River	46.0927	-115.5224	7	Clearwater
ID0020737D	Salmon River	45.6416	-116.286	8	Salmon
ID0020737U	Salmon River	45.6375	-116.2832	8	Salmon
ID0020753D	Snake River	42.74242	-112.89973	8	Upper Snake
ID0020753U	Snake River	42.7757	-112.8749	8	Upper Snake
ID0020788D	Mount Deary Creek	46.7987	-116.5727	2	Clearwater
ID0020800D	Priest River	48.179707	-116.893627	6	Panhandle
ID0020800U	Priest River	48.183772	-116.898412	6	Panhandle
ID0020893D	Canal Gulch Creek	46.4931	-115.7988	3	Clearwater
ID0020893U	Canal Gulch Creek	46.4971	-115.796	3	Clearwater
ID0020931D	Salmon River	45.4365	-116.3183	8	Salmon
ID0020931U	Salmon River	45.4255	-116.3155	8	Salmon
ID0020940D	D-Fifteen Drain	42.5533	-113.7704	1	Upper Snake
ID0020940U	D-Fifteen Drain	42.5522	-113.7687	1	Upper Snake
ID0021016D	Boise River	43.74754	-116.91249	7	Southwest
ID0021016U	Boise River	43.72079	-116.79806	7	Southwest
ID0021024D	Payette River	43.91355	-116.2036	7	Southwest
ID0021024U	Payette River	43.90433	-116.20142	7	Southwest
ID0021199D		44.06777	-116.93834	1	Southwest
ID0021199U	Payette River	44.0424	-116.92568	7	Southwest
ID0021202D	Snake River	43.57519	-116.81154	8	Southwest
ID0021202U	Snake River	43.54826	-116.80135	8	Southwest

DRAFT

Site ID	Water Body Name	Latitude	Longitude	Stream Order	BASIN
ID0021211D	Little Wood River	43.0412	-114.1692	6	Upper Snake
ID0021211U	Little Wood River	43.0421	-114.1692	6	Upper Snake
ID0021229D	Boyer Slough	48.304527	-116.475747	3	Panhandle
ID0021229D2	Boyer Slough	48.309375	-116.491864	3	Panhandle
ID0021229U	Boyer Slough	48.314988	-116.494562	3	Panhandle
ID0021296D	South Fork Coeur d'Alene River	47.465643	-115.811999	4	Panhandle
ID0021296U	South Fork Coeur d'Alene River	47.463505	-115.808568	4	Panhandle
ID0021776D	Sand Hollow Creek	43.79974	-116.97533	4	Southwest
ID0021776U	Sand Hollow Creek	43.78137	-116.95174	4	Southwest
ID0021806D	Weiser River	44.56448	-116.67768	6	Southwest
ID0021806U	Weiser River	44.56824	-116.66988	6	Southwest
ID0021822D	Portneuf River	42.62307	-112.03386	6	Upper Snake
ID0021822U	Portneuf River	42.62251	-112.01952	6	Upper Snake
ID0021831D	Boise River	43.68873	-116.68615	7	Southwest
ID0021831U	Boise River	43.6925	-116.63273	7	Southwest
ID0021849U	Cottonwood Creek	46.0442	-116.3427	3	Clearwater
ID0022004D	Snake River	42.93744	-115.3185	8	Southwest
ID0022004U	Snake River	42.9469	-115.29747	8	Southwest
ID0022012D	Elk Creek	45.8188	-115.45862	4	Clearwater
ID0022012U	Elk Creek	45.82366	-115.4469	4	Clearwater
ID0022047D	South Fork Rock Creek	42.57412	-112.8883	5	Upper Snake
ID0022047U	South Fork Rock Creek	42.57412	-112.8883	5	Upper Snake
ID0022071D	Big Creek	47.529174	-116.051552	4	Panhandle
ID0022071U	South Fork Coeur d'Alene River	47.516874	-116.035194	4	Panhandle
ID0022501D	Palouse River	46.9252	-116.9218	5	Clearwater
ID0022501U	Palouse River	46.9161	-116.8959	5	Clearwater
ID0022845D	Saint Maries River	47.130926	-116.41146	6	Panhandle
ID0022845U	Saint Maries River	47.123012	-116.403117	6	Panhandle
ID0022861D	Potlatch River	46.8542	-116.3978	5	Clearwater

DRAFT

Site ID	Water Body Name	Latitude	Longitude	Stream Order	BASIN
ID0022861U	Potlatch River	46.8572	-116.3998	5	Clearwater
ID0023027D	Big Lost River	43.89843	-113.60995	6	Upper Snake
ID0023027U	Big Lost River	43.90118	-113.6135	6	Upper Snake
ID0023159D	Little Salmon River	44.97366	-116.29453	5	Salmon
ID0023159U	Little Salmon River	44.97352	-116.2945	5	Salmon
ID0023167D	North Fork Payette River	44.50063	-116.02311	7	Southwest
ID0023167U	North Fork Payette River	44.512053	-116.0314	7	Southwest
ID0023604D	West Fork Little Bear Creek	46.7291	-116.7576	4	Clearwater
ID0023604U	West Fork Little Bear Creek	46.7321	-116.7577	4	Clearwater
ID0023710D	Farmers Own Canal	44.0495	-111.46033	1	Upper Snake
ID0023710D2		44.08959	-111.45874	1	Upper Snake
ID0023728D	Little Wood River	42.9477	-114.4245	6	Upper Snake
ID0023728U	Little Wood River	42.9477	-114.4245	6	Upper Snake
ID0023761D	Potlatch River	46.5583	-116.7111	7	Clearwater
ID0023761U	Potlatch River	46.5612	-116.7093	7	Clearwater
ID0023825D		42.58577	-111.72945	1	Bear River
ID0023825U	Bear River	42.59351	-111.7202	7	Bear River
ID0023914D	Grasshopper Creek	46.4226	-115.8919	4	Clearwater
ID0023914U	Grasshopper Creek	46.442	-115.867	3	Clearwater
ID0024350D	Little Sand Creek	48.318947	-116.569486	3	Panhandle
ID0024350U	Little Sand Creek	48.325258	-116.577875	3	Panhandle
ID0024422D	Big Wood River	43.6286	-114.3487	6	Upper Snake
ID0024422D2	Big Wood River	43.6288	-114.3487	6	Upper Snake
ID0024422U	Big Wood River	43.6344	-114.3495	6	Upper Snake
ID0024554D	Potlatch River	46.5989	-116.678	7	Clearwater
ID0024554U	Potlatch River	46.6124	-116.658	7	Clearwater
ID0024627D		47.645726	-116.720738	2	Panhandle
ID0024988D	Snake River	43.30951	-112.19685	8	Upper Snake
ID0024988U	Snake River	43.31203	-112.18351	8	Upper Snake

DRAFT

Site ID	Water Body Name	Latitude	Longitude	Stream Order	BASIN
ID0025071D	West Fork Saint Maries River	47.005926	-116.256966	5	Panhandle
ID0025071U	West Fork Saint Maries River	47.00413	-116.25819	5	Panhandle
ID0025143D	Bear River	42.4559	-111.3874	7	Bear River
ID0025143U	Bear River	42.469	-111.3976	7	Bear River
ID0025194D	Portneuf River	42.6201	-112.012	6	Upper Snake
ID0025194U	Portneuf River	42.62	-112.0083	6	Upper Snake
ID0025429D	South Fork Coeur d'Alene River	47.487037	-115.944175	4	Panhandle
ID0025429U	South Fork Coeur d'Alene River	47.477346	-115.934144	4	Panhandle
ID0025488D	Boise River	43.61693	-116.2228	7	Southwest
ID0025488U	Boise River	43.61311	-116.21918	7	Southwest
ID0025569D	Cub River	42.0181	-111.808	5	Bear River
ID0025569U	Cub River	42.0139	-111.8139	5	Bear River
ID0025585D	Bear River	42.40115	-111.3546	7	Bear River
ID0025585U	Bear River	42.3286	-111.3512	7	Bear River
ID0025607U	Clearwater River	46.4205	-117.0162	8	Clearwater
ID0026077D	Warren Creek	45.2595	-115.6695	4	Salmon
ID0026077U	Warren Creek	45.2549	-115.6605	4	Salmon
ID0026085D	Bear River	42.1683	-111.8384	7	Bear River
ID0026085U	Bear River	42.1663	-111.8314	7	Bear River
ID0026310D	Fourmile Creek	46.8274	-117.0373	3	Clearwater
ID0026310U	Fourmile Creek	46.8296	-117.0341	3	Clearwater
ID0026531D	Clearwater River	46.4269	-117.0263	8	Clearwater
ID0026531U	Clearwater River	46.421	-117.0052	8	Clearwater
ID0026913D	Snake River	43.72094	-112.09633	8	Upper Snake
ID0026913U	Butte Market Lake Canal	43.71576	-112.12337	1	Upper Snake
ID0026964D	Indian Creek	43.60406	-116.5915	5	Southwest
ID0026964U	Indian Creek	43.59455	-116.57313	5	Southwest
ID0027120D	Little Wood River	42.94238	-114.6282	6	Upper Snake
ID0027120U	Little Wood River	42.95151	-114.62791	6	Upper Snake

DRAFT

Site ID	Water Body Name	Latitude	Longitude	Stream Order	BASIN
ID0027154D	Paradise Creek	46.7309	-117.0395	3	Clearwater
ID0027154U	Paradise Creek	46.732	-117.0245	3	Clearwater
ID0027383D	Indian Creek	43.66322	-116.68353	5	Southwest
ID0027383U	Indian Creek	43.65867	-116.67167	5	Southwest
ID0027928D	Big Wood River	43.669	-114.3667	6	Upper Snake
ID0027928U	Big Wood River	43.672	-114.367	6	Upper Snake
ID0027944D		48.160395	-116.758009	NA	Panhandle
ID0027944U		48.161098	-116.749746	NA	Panhandle
ID0027952D	Tenmile Creek	43.5973	-116.39912	4	Southwest
ID0027952U	Tenmile Creek	43.59184	-116.39533	4	Southwest
ID0027979D		43.57099	-115.27245	3	Southwest
ID0027979U	South Fork Boise River	43.59459	-115.27346	6	Southwest
ID0027995D	Clark Fork	48.086713	-116.079872	NA	Panhandle
ID0027995U	Dry Creek	48.075433	-116.083616	3	Panhandle
ID0028312D	Mores Creek	43.64747	-115.99103	6	Southwest
ID0028312U	Mores Creek	43.65147	-115.98079	6	Southwest
ID0028321D	Big Deer Creek	45.16761	-114.36046	4	Salmon
ID0028321U	Big Deer Creek	45.16662	-114.36622	4	Salmon
ID0028355D	Indian Creek	43.55133	-116.50368	5	Southwest
ID0028355U	Indian Creek	43.53292	-116.47351	5	Southwest
PantherCKD	Panther Creek	45.08977	-114.2373	5	Salmon
PantherCKD2	Panther Creek	45.18056	-114.3179	6	Salmon
PantherCKU	Panther Creek	45.07751	-114.26009	5	Salmon
PantherCKU2	Panther Creek	45.17689	-114.31431	6	Salmon
SFDeerCKD	South Fork Big Deer Creek	45.16101	-114.36993	3	Salmon
SFDeerCKU	South Fork Big Deer Creek	45.1573	-114.37328	2	Salmon

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
ID0000060D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0000060U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0000159D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0000159U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0000167D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0000167U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0000213D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0000213U	Snake River Plain	12a	Treasure Valley	PPBV	Stream
ID0000388D	Snake River Plain	12i	Magic Valley	PPBV	River
ID0000388U	Snake River Plain	12i	Magic Valley	PPBV	River
ID0001155D	Snake River Plain	12a	Treasure Valley	PPBV	Other
ID0001155U	Snake River Plain	12a	Treasure Valley	PPBV	Stream
ID0001198D	Northern Basin and Range	80i	Sagebrush Steppe Valleys	PPBV	Stream
ID0001198U	Northern Basin and Range	80i	Sagebrush Steppe Valleys	PPBV	Stream
ID0020001D	Middle Rockies	17ab	Dry Gneissic-Schistose-Volcanic Hills	Foothills	River
ID0020001U	Middle Rockies	17aa	Dry Intermontane Sagebrush Valleys	PPBV	River
ID0020010D	Snake River Plain	12e	Upper Snake River Plain	PPBV	Stream
ID0020010U	Snake River Plain	12e	Upper Snake River Plain	PPBV	Stream
ID0020036D	Columbia Plateau	10j	Nez Perce Prairie	PPBV	Stream
ID0020036U	Idaho Batholith	16f	Foothill Shrublands-Grasslands	PPBV	Stream
ID0020061D	Snake River Plain	12i	Magic Valley	PPBV	Stream
ID0020061U	Snake River Plain	12i	Magic Valley	PPBV	Stream
ID0020087D	Snake River Plain	12f	Semiarid Foothills	PPBV	River
ID0020087U	Snake River Plain	12f	Semiarid Foothills	PPBV	River
ID0020117D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	River
ID0020117U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	River
ID0020125D	Columbia Plateau	10h	Palouse Hills	PPBV	Stream
ID0020125U	Columbia Plateau	10h	Palouse Hills	PPBV	Stream

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
ID0020133D	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0020133U	Snake River Plain	12e	Upper Snake River Plain	PPBV	Stream
ID0020141D	Snake River Plain	12d	Dissected Plateaus and Teton Basin	PPBV	Stream
ID0020141U	Snake River Plain	12d	Dissected Plateaus and Teton Basin	PPBV	Stream
ID0020206D	Northern Rockies	15i	Clearwater Mountains and Breaks	Mountains	River
ID0020206U	Northern Rockies	15i	Clearwater Mountains and Breaks	Mountains	River
ID0020222D	Northern Rockies	15m	Kootenai Valley	Foothills	River
ID0020222U	Northern Rockies	15m	Kootenai Valley	Foothills	River
ID0020231D	Idaho Batholith	16g	High Glacial Drift-Filled Valleys	Mountains	River
ID0020231U	Idaho Batholith	16g	High Glacial Drift-Filled Valleys	Mountains	River
ID0020249D	Northern Basin and Range	80b	Semiarid Hills and Low Mountains	PPBV	River
ID0020249U	Northern Basin and Range	80b	Semiarid Hills and Low Mountains	PPBV	River
ID0020311D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0020311U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0020338D	Snake River Plain	12a	Treasure Valley	PPBV	Other
ID0020338U	Snake River Plain	12a	Treasure Valley	PPBV	Stream
ID0020354D	Northern Rockies	15n	Weippe Prairie	Foothills	River
ID0020354U	Northern Rockies	15n	Weippe Prairie	Foothills	Stream
ID0020362D	Northern Rockies	15p	St. Joe Schist-Gneiss Zone	Mountains	Stream
ID0020362U	Northern Rockies	15p	St. Joe Schist-Gneiss Zone	Mountains	Stream
ID0020389D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0020389U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0020401D	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0020401U	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0020427D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0020427U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0020451D	Northern Rockies	15m	Kootenai Valley	Foothills	River
ID0020451U	Northern Rockies	15m	Kootenai Valley	Foothills	River

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
ID0020532D	Northern Rockies	15v	Northern Idaho Hills and Low Relief Mountains	Foothills	River
ID0020532U	Columbia Plateau	10h	Palouse Hills	PPBV	River
ID0020567D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0020567U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0020681D	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Other
ID0020681U	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Other
ID0020699D	Idaho Batholith	16i	South Clearwater Forested Mountains	Mountains	River
ID0020699U	Idaho Batholith	16i	South Clearwater Forested Mountains	Mountains	Stream
ID0020711D	Idaho Batholith	16c	Lochsa-Selway-Clearwater Canyons	Mountains	River
ID0020711U	Idaho Batholith	16c	Lochsa-Selway-Clearwater Canyons	Mountains	River
ID0020737D	Blue Mountains	11g	Canyons and Dissected Uplands	Foothills	River
ID0020737U	Blue Mountains	11g	Canyons and Dissected Uplands	Foothills	River
ID0020753D	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0020753U	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0020788D	Northern Rockies	15f	Grassy Potlatch Ridges	Foothills	Stream
ID0020800D	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	River
ID0020800U	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	River
ID0020893D	Northern Rockies	15i	Clearwater Mountains and Breaks	Mountains	Stream
ID0020893U	Northern Rockies	15i	Clearwater Mountains and Breaks	Mountains	Stream
ID0020931D	Blue Mountains	11g	Canyons and Dissected Uplands	Foothills	River
ID0020931U	Blue Mountains	11g	Canyons and Dissected Uplands	Foothills	River
ID0020940D	Snake River Plain	12i	Magic Valley	PPBV	Stream
ID0020940U	Snake River Plain	12i	Magic Valley	PPBV	Stream
ID0021016D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0021016U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0021024D	Idaho Batholith	16f	Foothill Shrublands-Grasslands	PPBV	River
ID0021024U	Idaho Batholith	16f	Foothill Shrublands-Grasslands	PPBV	River
ID0021199D	Snake River Plain	12a	Treasure Valley	PPBV	Stream

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
ID0021199U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0021202D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0021202U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0021211D	Snake River Plain	12i	Magic Valley	PPBV	River
ID0021211U	Snake River Plain	12i	Magic Valley	PPBV	River
ID0021229D	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Stream
ID0021229D2	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Stream
ID0021229U	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Stream
ID0021296D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0021296U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0021776D	Snake River Plain	12a	Treasure Valley	PPBV	Stream
ID0021776U	Snake River Plain	12a	Treasure Valley	PPBV	Stream
ID0021806D	Snake River Plain	12f	Semiarid Foothills	PPBV	River
ID0021806U	Snake River Plain	12f	Semiarid Foothills	PPBV	River
ID0021822D	Northern Basin and Range	80b	Semiarid Hills and Low Mountains	PPBV	River
ID0021822U	Northern Basin and Range	80b	Semiarid Hills and Low Mountains	PPBV	River
ID0021831D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0021831U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0021849U	Columbia Plateau	10j	Nez Perce Prairie	PPBV	Stream
ID0022004D	Snake River Plain	12h	Mountain Home Uplands	PPBV	River
ID0022004U	Snake River Plain	12h	Mountain Home Uplands	PPBV	River
ID0022012D	Idaho Batholith	16i	South Clearwater Forested Mountains	Mountains	Stream
ID0022012U	Idaho Batholith	16i	South Clearwater Forested Mountains	Mountains	Stream
ID0022047D	Northern Basin and Range	80i	Sagebrush Steppe Valleys	PPBV	River
ID0022047U	Northern Basin and Range	80i	Sagebrush Steppe Valleys	PPBV	River
ID0022071D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0022071U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0022501D	Columbia Plateau	10h	Palouse Hills	PPBV	River

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
ID0022501U	Columbia Plateau	10h	Palouse Hills	PPBV	River
ID0022845D	Northern Rockies	15p	St. Joe Schist-Gneiss Zone	Mountains	River
ID0022845U	Northern Rockies	15p	St. Joe Schist-Gneiss Zone	Mountains	River
ID0022861D	Northern Rockies	15v	Northern Idaho Hills and Low Relief Mountains	Foothills	River
ID0022861U	Northern Rockies	15v	Northern Idaho Hills and Low Relief Mountains	Foothills	River
ID0023027D	Middle Rockies	17aa	Dry Intermontane Sagebrush Valleys	PPBV	River
ID0023027U	Middle Rockies	17aa	Dry Intermontane Sagebrush Valleys	PPBV	River
ID0023159D	Idaho Batholith	16g	High Glacial Drift-Filled Valleys	Mountains	River
ID0023159U	Idaho Batholith	16g	High Glacial Drift-Filled Valleys	Mountains	River
ID0023167D	Idaho Batholith	16g	High Glacial Drift-Filled Valleys	Mountains	River
ID0023167U	Idaho Batholith	16g	High Glacial Drift-Filled Valleys	Mountains	River
ID0023604D	Northern Rockies	15j	Lower Clearwater Canyons	Foothills	Stream
ID0023604U	Northern Rockies	15j	Lower Clearwater Canyons	Foothills	Stream
ID0023710D	Snake River Plain	12d	Dissected Plateaus and Teton Basin	PPBV	Stream
ID0023710D2	Snake River Plain	12d	Dissected Plateaus and Teton Basin	PPBV	Stream
ID0023728D	Snake River Plain	12i	Magic Valley	PPBV	River
ID0023728U	Snake River Plain	12i	Magic Valley	PPBV	River
ID0023761D	Northern Rockies	15j	Lower Clearwater Canyons	Foothills	River
ID0023761U	Northern Rockies	15j	Lower Clearwater Canyons	Foothills	River
ID0023825D	Northern Basin and Range	80i	Sagebrush Steppe Valleys	PPBV	Stream
ID0023825U	Northern Basin and Range	80i	Sagebrush Steppe Valleys	PPBV	River
ID0023914D	Northern Rockies	15n	Weippe Prairie	Foothills	Stream
ID0023914U	Northern Rockies	15i	Clearwater Mountains and Breaks	Mountains	Stream
ID0024350D	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Stream
ID0024350U	Northern Rockies	15y	Selkirk Mountains	Mountains	Stream
ID0024422D	Idaho Batholith	16f	Foothill Shrublands-Grasslands	PPBV	River
ID0024422D2	Idaho Batholith	16f	Foothill Shrublands-Grasslands	PPBV	River
ID0024422U	Idaho Batholith	16f	Foothill Shrublands-Grasslands	PPBV	River

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
ID0024554D	Northern Rockies	15j	Lower Clearwater Canyons	Foothills	River
ID0024554U	Northern Rockies	15j	Lower Clearwater Canyons	Foothills	River
ID0024627D	Northern Rockies	15v	Northern Idaho Hills and Low Relief Mountains	Foothills	Stream
ID0024988D	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0024988U	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0025071D	Northern Rockies	15p	St. Joe Schist-Gneiss Zone	Mountains	River
ID0025071U	Northern Rockies	15p	St. Joe Schist-Gneiss Zone	Mountains	River
ID0025143D	Wasatch and Uinta Mountains	19f	Semiarid Foothills	Mountains	River
ID0025143U	Wasatch and Uinta Mountains	19f	Semiarid Foothills	Mountains	River
ID0025194D	Northern Basin and Range	80b	Semiarid Hills and Low Mountains	PPBV	River
ID0025194U	Northern Basin and Range	80b	Semiarid Hills and Low Mountains	PPBV	River
ID0025429D	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0025429U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0025488D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0025488U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0025569D	Central Basin and Range	13i	Malad and Cache Valleys	PPBV	River
ID0025569U	Central Basin and Range	13i	Malad and Cache Valleys	PPBV	River
ID0025585D	Wyoming Basin	18c	Sub-Irrigated High Valleys	PPBV	River
ID0025585U	Wyoming Basin	18c	Sub-Irrigated High Valleys	PPBV	River
ID0025607U	Columbia Plateau	10l	Lower Snake and Clearwater Canyons	PPBV	River
ID0026077D	Idaho Batholith	16k	Southern Forested Mountains	Mountains	Stream
ID0026077U	Idaho Batholith	16k	Southern Forested Mountains	Mountains	Stream
ID0026085D	Central Basin and Range	13i	Malad and Cache Valleys	PPBV	River
ID0026085U	Central Basin and Range	13i	Malad and Cache Valleys	PPBV	River
ID0026310D	Columbia Plateau	10h	Palouse Hills	PPBV	Stream
ID0026310U	Columbia Plateau	10h	Palouse Hills	PPBV	Stream

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
ID0026531D	Columbia Plateau	10l	Lower Snake and Clearwater Canyons	PPBV	River
ID0026531U	Columbia Plateau	10l	Lower Snake and Clearwater Canyons	PPBV	River
ID0026913D	Snake River Plain	12e	Upper Snake River Plain	PPBV	River
ID0026913U	Snake River Plain	12e	Upper Snake River Plain	PPBV	Stream
ID0026964D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0026964U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0027120D	Snake River Plain	12i	Magic Valley	PPBV	River
ID0027120U	Snake River Plain	12i	Magic Valley	PPBV	River
ID0027154D	Columbia Plateau	10h	Palouse Hills	PPBV	Stream
ID0027154U	Columbia Plateau	10h	Palouse Hills	PPBV	Stream
ID0027383D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0027383U	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0027928D	Idaho Batholith	16d	Dry Partly Wooded Mountains	Mountains	River
ID0027928U	Idaho Batholith	16d	Dry Partly Wooded Mountains	Mountains	River
ID0027944D	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Other
ID0027944U	Northern Rockies	15u	Inland Maritime Foothills and Valleys	Foothills	Other
ID0027952D	Snake River Plain	12a	Treasure Valley	PPBV	Stream
ID0027952U	Snake River Plain	12a	Treasure Valley	PPBV	Stream
ID0027979D	Idaho Batholith	16k	Southern Forested Mountains	Mountains	Stream
ID0027979U	Idaho Batholith	16k	Southern Forested Mountains	Mountains	River
ID0027995D	Northern Rockies	15q	Purcell-Cabinet-North Bitterroot Mountains	Mountains	Other
ID0027995U	Northern Rockies	15o	Coeur d Alene Metasedimentary Zone	Mountains	Stream
ID0028312D	Idaho Batholith	16f	Foothill Shrublands-Grasslands	PPBV	River
ID0028312U	Idaho Batholith	16k	Southern Forested Mountains	Mountains	River
ID0028321D	Idaho Batholith	16k	Southern Forested Mountains	Mountains	Stream
ID0028321U	Idaho Batholith	16k	Southern Forested Mountains	Mountains	Stream
ID0028355D	Snake River Plain	12a	Treasure Valley	PPBV	River
ID0028355U	Snake River Plain	12a	Treasure Valley	PPBV	River

DRAFT

Site ID	Level 3 Eco Region Name	Level 4 Eco Region	Level 4 Ecoregion Name	WBAG III Site Class	River/Stream
PantherCKD	Idaho Batholith	16k	Southern Forested Mountains	Mountains	River
PantherCKD2	Idaho Batholith	16k	Southern Forested Mountains	Mountains	River
PantherCKU	Idaho Batholith	16k	Southern Forested Mountains	Mountains	River
PantherCKU2	Idaho Batholith	16k	Southern Forested Mountains	Mountains	River
SFDeerCKD	Idaho Batholith	16k	Southern Forested Mountains	Mountains	Stream
SFDeerCKU	Idaho Batholith	16k	Southern Forested Mountains	Mountains	Stream

DRAFT

Appendix B. Sample Results

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0020036U	13.3	8.26	0.06	0.1	9/25/2016
ID0027952D	21.05	13.08	0.09	0.15	9/28/2016
ID0027952U	31.19	19.37	0.06	0.1	9/28/2016
ID0020427U	18.23	11.32	0.02	0.04	9/29/2016
ID0021016D	25.78	16.01	0.04	0.06	9/29/2016
ID0021016U	23.05	14.32	0.05	0.08	9/29/2016
ID0021202D	0.96	0.6	0.38	0.62	9/29/2016
ID0021202U	17.51	10.88	0.02	0.04	9/29/2016
ID0001155D	24.97	15.51	0.03	0.05	10/4/2016
ID0001155U	24.92	15.48	0.03	0.04	10/4/2016
ID0020087D	20.77	12.9	0.03	0.05	10/4/2016
ID0020087U	20.2	12.54	0.03	0.06	10/4/2016
ID0021806D	17.41	10.81	0.04	0.07	10/4/2016
ID0021806U	18.73	11.63	0.04	0.06	10/4/2016
ID0020311D	15.66	9.73	0.02	0.02	10/5/2016
ID0020311U	13.36	8.3	0.02	0.03	10/5/2016
ID0021024D	11.03	6.85	0.02	0.03	10/5/2016
ID0021024U	11.29	7.01	0.02	0.03	10/5/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0021831D	14.5	9.01	0.06	0.1	10/5/2016
ID0021831U	16.76	10.41	0.05	0.07	10/5/2016
ID0025488D	10.22	6.35	0.02	0.04	10/13/2016
ID0025488U	10.1	6.27	0.03	0.05	10/13/2016
ID0028312D	8.1	5.03	0.02	0.04	10/13/2016
ID0028312U	7.81	4.85	0.03	0.05	10/13/2016
ID0021776D	21.18	13.15	0.09	0.15	10/18/2016
ID0021776U	19.77	12.28	0.14	0.23	10/18/2016
ID0026964D	25.92	16.1	0.08	0.13	10/18/2016
ID0026964U	19.5	12.11	0.07	0.11	10/18/2016
ID0027383D	20.65	12.83	0.05	0.09	10/18/2016
ID0027383U	20.39	12.66	0.06	0.1	10/18/2016
ID0028355D	29.49	18.32	0.05	0.08	10/18/2016
ID0028355U	36.52	22.68	0.06	0.09	10/18/2016
ID0020231D	14.69	9.13	0.02	0.03	10/19/2016
ID0020231U	9.33	5.8	0.03	0.04	10/19/2016
ID0023167D	17.57	10.91	0.02	0.03	10/19/2016
ID0023167U	15.75	9.78	0.02	0.04	10/19/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0022004D	12.94	8.04	0.04	0.07	10/20/2016
ID0022004U	13.04	8.1	0.04	0.07	10/20/2016
ID0000213D	14.26	8.86	0.03	0.05	10/25/2016
ID0000213U	13.2	8.2	0.03	0.05	10/25/2016
ID0020338D	19.28	11.97	0.03	0.04	10/25/2016
ID0020338U	20.51	12.74	0.03	0.04	10/25/2016
ID0020389D	11.05	6.87	0.04	0.06	10/25/2016
ID0020389U	12.53	7.78	0.03	0.05	10/25/2016
ID0020427D	17.95	11.15	0.03	0.04	10/25/2016
ID0021199D	13.66	8.48	0.03	0.05	10/25/2016
ID0021199U	12.09	7.51	0.03	0.05	10/25/2016
ID0027979D	9.33	5.79	0.02	0.03	10/26/2016
ID0027979U	6.95	4.32	0.02	0.04	10/26/2016
ID0023159D	23.06	14.32	0.05	0.08	10/19/2016
ID0023159U	27.77	17.25	0.05	0.08	10/19/2016
ID0000060D	2.1	1.31	0.3	0.48	10/4/2016
ID0000060U	1.31	0.81	0.42	0.67	10/4/2016
ID0000159D	2.01	1.25	0.28	0.46	10/4/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0000159U	1.56	0.97	0.38	0.62	10/4/2016
ID0000167D	1	0.62	0.32	0.52	10/4/2016
ID0000167U	0.39	0.24	0.64	1.04	10/4/2016
ID0020567D	0.98	0.61	0.22	0.36	10/4/2016
ID0020567U	0.88	0.55	0.13	0.2	10/4/2016
ID0021296D	1.6	1	0.46	0.74	10/4/2016
ID0021296U	1.93	1.2	0.52	0.84	10/4/2016
ID0025429D	1.99	1.24	0.29	0.46	10/4/2016
ID0025429U	1.78	1.11	0.28	0.44	10/4/2016
ID0020117D	1.35	0.84	0.46	0.74	10/5/2016
ID0020117U	1.73	1.08	0.33	0.53	10/5/2016
ID0022071D	1.61	1	0.3	0.48	10/5/2016
ID0022071U	2.25	1.4	0.26	0.42	10/5/2016
ID0022845D	9.54	5.92	0.03	0.05	10/6/2016
ID0025071D	11.18	6.95	0.04	0.07	10/6/2016
ID0025071U	13.29	8.25	0.03	0.05	10/6/2016
ID0022845U	14.25	8.85	0.02	0.03	10/6/2016
ID0024627D	7.58	4.71	0.06	0.1	10/19/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0020681D	9.95	6.18	0.05	0.08	10/25/2016
ID0020681U	9.72	6.04	0.06	0.1	10/25/2016
ID0020800D	8.38	5.21	0.03	0.06	10/25/2016
ID0020800U	6.09	3.78	0.02	0.03	10/25/2016
ID0021229D	34.93	21.7	0.02	0.04	10/25/2016
ID0027944D	11.11	6.9	0.06	0.1	10/25/2016
ID0027944U	12.2	7.58	0.05	0.07	10/25/2016
ID0020451D	11.81	7.33	0.03	0.04	10/26/2016
ID0020222D	10.65	6.61	0.03	0.05	10/26/2016
ID0020222U	11.15	6.92	0.03	0.05	10/26/2016
ID0024350D	4.76	2.96	0.05	0.08	10/26/2016
ID0024350U	20.2	12.55	0.01	0.01	10/26/2016
ID0020451U	NA	NA	NA	NA	10/26/2016
ID0021229D2	40.4	25.09	0.04	0.06	10/27/2016
ID0021229U	36.45	22.64	0.04	0.07	10/27/2016
ID0027995D	7.79	4.84	0.05	0.09	10/27/2016
ID0027995U	10.4	6.46	0.04	0.07	10/27/2016
ID0028321D	2.59	1.61	1.1	1.78	9/13/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
PantherCKD	9.59	5.96	0.05	0.09	9/13/2016
PantherCKD2	13.93	8.65	0.07	0.11	9/13/2016
PantherCKU	10.24	6.36	0.04	0.06	9/13/2016
PantherCKU2	14.07	8.74	0.05	0.08	9/13/2016
SFDeerCKD	3.93	2.44	1.69	2.73	9/13/2016
SFDeerCKU	4.02	2.49	0.18	0.28	9/13/2016
ID0020001D	19.07	11.84	0.02	0.03	9/14/2016
ID0020001U	17.12	10.63	0.02	0.03	9/14/2016
ID0023027U	7.63	4.74	0.08	0.13	9/16/2016
ID0028321U	3.51	2.18	0.69	1.11	9/16/2016
ID0020010U	10.9	6.77	0.02	0.04	9/19/2016
ID0020010D	12.32	7.65	0.02	0.03	9/19/2016
ID0020401D	9.89	6.15	0.02	0.03	9/19/2016
ID0020401U	9.02	5.61	0.02	0.04	9/19/2016
ID0026913D	38.7	24.04	0.02	0.04	9/19/2016
ID0026913U	4.42	2.74	0.07	0.12	9/19/2016
ID0020141U	3.17	1.97	0.03	0.05	9/21/2016
ID0020141D	16.96	10.53	0.09	0.15	9/21/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0023710D	NA	NA	NA	NA	9/21/2016
ID0023710D2	NA	NA	NA	NA	9/21/2016
ID0023027D	9.92	6.16	0.03	0.05	9/26/2016
ID0020737D	11.39	7.07	0.03	0.04	9/6/2016
ID0020737U	10.4	6.46	0.03	0.05	9/6/2016
ID0020931D	10.14	6.3	0.03	0.05	9/6/2016
ID0026077D	4.63	2.87	0.04	0.06	9/6/2016
ID0026077U	5.44	3.38	0.04	0.06	9/6/2016
ID0020931U	11.18	6.94	0.04	0.06	9/6/2016
ID0020362D	7.64	4.74	0.03	0.05	9/7/2016
ID0020362U	27.82	17.28	0.01	0.02	9/7/2016
ID0020532D	15.21	9.44	0.03	0.05	9/7/2016
ID0020532U	31.97	19.85	0.02	0.03	9/7/2016
ID0020788D	6.11	3.79	0.05	0.09	9/7/2016
ID0022861D	10.09	6.27	0.05	0.08	9/7/2016
ID0022861U	12.59	7.82	0.03	0.04	9/7/2016
ID0023761D	14.33	8.9	0.04	0.07	9/7/2016
ID0023761U	12.64	7.85	0.05	0.08	9/7/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0024554D	11.06	6.87	0.07	0.11	9/7/2016
ID0024554U	23.33	14.49	0.03	0.05	9/7/2016
ID0020206D	8.82	5.48	0.03	0.05	9/8/2016
ID0020206U	8.17	5.07	0.03	0.04	9/8/2016
ID0020354D	23.09	14.34	0.03	0.04	9/8/2016
ID0020354U	29.14	18.1	0.04	0.07	9/8/2016
ID0020893D	10.1	6.27	0.02	0.03	9/8/2016
ID0020893U	15.24	9.47	0.02	0.03	9/8/2016
ID0023914D	8.15	5.06	0.04	0.07	9/8/2016
ID0023914U	8.62	5.36	0.04	0.06	9/8/2016
ID0020125D	11.15	6.93	0.04	0.07	9/9/2016
ID0020125U	21.64	13.44	0.07	0.11	9/9/2016
ID0023604D	53.39	33.16	0.11	0.18	9/9/2016
ID0023604U	4.24	2.63	0.17	0.28	9/9/2016
ID0022501D	13.56	8.42	0.04	0.07	9/12/2016
ID0022501U	18.86	11.71	0.03	0.05	9/12/2016
ID0025607U	6.5	4.04	0.05	0.09	9/12/2016
ID0026310D	11.32	7.03	0.06	0.09	9/12/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0026310U	6.89	4.28	0.08	0.12	9/12/2016
ID0026531D	8.29	5.15	0.04	0.06	9/12/2016
ID0026531U	8.72	5.42	0.06	0.1	9/12/2016
ID0027154D	29.41	18.26	0.11	0.17	9/12/2016
ID0027154U	18.21	11.31	0.06	0.09	9/12/2016
ID0020036D	22.32	13.87	0.14	0.23	9/25/2016
ID0020699D	25.46	15.81	0.01	0.02	9/25/2016
ID0020699U	17.96	11.16	0.02	0.03	9/25/2016
ID0021849U	37.72	23.43	0.06	0.1	9/25/2016
ID0022012D	16.67	10.35	0.24	0.39	9/25/2016
ID0022012U	16.03	9.96	0.02	0.04	9/25/2016
ID0020711D	18.9	11.74	0.01	0.02	10/5/2016
ID0020711U	20.39	12.66	0.01	0.02	10/5/2016
ID0020249D	24.9	15.47	0.02	0.03	9/15/2016
ID0020249U	15.7	9.75	0.02	0.03	9/15/2016
ID0001198D	12.9	8.02	0.02	0.04	9/19/2016
ID0001198U	4.89	3.04	0.05	0.08	9/19/2016
ID0025585D	42.09	26.14	0.01	0.01	9/19/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0025585U	38.22	23.74	0.01	0.01	9/19/2016
ID0023825D	31.8	19.75	0.01	0.02	9/26/2016
ID0023825U	25.36	15.75	0.01	0.02	9/26/2016
ID0025143U	22.86	14.2	0.03	0.04	9/26/2016
ID0025194D	15.82	9.82	0.02	0.03	9/26/2016
ID0025194U	13.42	8.33	0.02	0.04	9/26/2016
ID0025143D	7.38	4.59	0.03	0.04	9/26/2016
ID0025569D	19.09	11.86	0.04	0.06	10/3/2016
ID0025569U	12.31	7.65	0.04	0.06	10/3/2016
ID0026085D	18.82	11.69	0.07	0.11	10/3/2016
ID0026085U	26.67	16.57	0.02	0.03	10/3/2016
ID0020133U	5.94	3.69	0.03	0.06	10/10/2016
ID0020133D	8.11	5.03	0.04	0.07	10/10/2016
ID0024988D	11.92	7.4	0.02	0.03	10/10/2016
ID0024988U	9	5.59	0.03	0.05	10/10/2016
ID0021822D	24.9	15.47	0.01	0.02	10/25/2016
ID0021822U	24.26	15.07	0.01	0.02	10/25/2016
ID0024422U	5.47	3.39	0.06	0.1	9/6/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0024422D	NA	NA	NA	NA	9/6/2016
ID0020061D	34.16	21.22	0.03	0.05	9/8/2016
ID0027928D	4.26	2.65	0.04	0.07	9/8/2016
ID0027928U	3.12	1.94	0.08	0.12	9/8/2016
ID0021211U	NA	NA	NA	NA	9/12/2016
ID0021211D	NA	NA	NA	NA	9/12/2016
ID0020940U	NA	NA	NA	NA	9/12/2016
ID0020940D	NA	NA	NA	NA	9/12/2016
ID0027120D	0.56	0.35	0.87	1.39	9/19/2016
ID0027120U	2.11	1.31	0.25	0.4	9/19/2016
ID0020061U	NA	NA	NA	NA	9/19/2016
ID0024422D2	NA	NA	NA	NA	9/19/2016
ID0000388D	2.37	1.47	0.36	0.57	9/20/2016
ID0000388U	1.91	1.19	0.35	0.56	9/20/2016
ID0023728D	3.39	2.1	0.22	0.35	9/20/2016
ID0023728U	3.08	1.91	0.19	0.3	9/20/2016
ID0020753U	NA	NA	NA	NA	10/10/2016
ID0020753D	15.21	9.45	0.02	0.03	10/10/2016

DRAFT

MLOC_ID	CMC_ugL	CCC_ugL	AcuteToxicUnits	ChronicToxicUnits	ACT_START_DATE
ID0022047D	39.67	24.64	0.01	0.02	10/25/2016
ID0022047U	84.04	52.2	0.01	0.01	10/25/2016

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0020036U	13	8	0.000805	2.08	14.4	4.82	5.42	2.84	0.047	5.2	59.1
ID0027952D	15.38	8.48	0.00195	2.14	13.9	2.17	6.24	1.32	0.047	2.58	50.7
ID0027952U	14.565	9.22	0.00196	2.08	13.7	2.11	5.41	1.18	0.047	0.973	48.9
ID0020427U	15.449	8.26	0.000434	1.73	41.3	18	26.7	5.34	51.4	23.7	158
ID0021016D	16.057	8.2	0.000958	2.72	33.5	8.85	28.7	3.95	29.1	12.5	137
ID0021016U	16.304	8.23	0.00111	2.44	28.9	7.38	23.7	3.29	23.7	10.9	115
ID0021202D	16.849	5.84	0.00037	1.71	42.4	18.3	27.2	5.5	51.6	24.4	163
ID0021202U	15.21	8.25	0.000425	1.64	42.5	18.6	27.1	5.46	60.8	29.1	226
ID0001155D	12.922	8.39	0.000827	2.25	38.6	15.9	31.8	5.7	53.8	20.9	164
ID0001155U	12.984	8.41	0.000673	2.15	42.3	17.8	35.3	6.41	60.8	23.8	167
ID0020087D	9.153	8.56	0.000699	2.15	13.2	5.03	9.18	1.85	0.047	2.31	67.3
ID0020087U	10.016	8.6	0.00069	2.01	13.1	4.89	10.1	1.83	11.1	2.47	66
ID0021806D	10.337	8.54	0.000767	1.78	12.8	4.71	10.8	1.69	11.2	5.1	61.2
ID0021806U	10.563	8.61	0.000748	1.83	12.3	4.54	10.7	1.63	11.5	5.13	60
ID0020311D	12.278	8.25	0.000235	1.98	8.42	1.18	5.39	0.741	0.047	1.36	34.4
ID0020311U	12.572	8.05	0.000234	2	7.46	1.02	4.42	0.629	0.047	1.05	29
ID0021024D	9.292	7.88	0.000196	1.97	6.51	0.762	3.8	0.557	0.047	0.955	25.9
ID0021024U	9.204	7.92	0.000194	1.94	6.58	0.766	3.81	0.557	0.047	0.908	26.2
ID0021831D	11.481	7.92	0.000927	2.27	23.7	5.47	18.1	2.42	15.3	9.63	96.8

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0021831U	12.016	8.14	0.000769	2.21	19.1	3.61	14.4	2.02	11.7	8.79	70.2
ID0025488D	11.222	8.03	0.000232	1.62	10.9	1.32	3.87	0.545	0.047	1.02	37.4
ID0025488U	11.191	8.03	0.000301	1.6	10.9	1.31	3.88	0.541	0.047	0.895	37.5
ID0028312D	4.099	8.02	0.000198	1.32	15.3	2.17	6.8	0.788	0.047	1.44	51.4
ID0028312U	4.105	7.98	0.000243	1.32	15.2	2.16	6.65	0.764	0.047	1.27	51.7
ID0021776D	10.798	8.11	0.00201	2.34	46.8	13.3	47	5.83	60	21.8	206
ID0021776U	10.79	8.01	0.00277	2.38	46.8	13	47.3	5.45	60.2	21.5	220
ID0026964D	13.813	7.62	0.00207	4.42	52.1	15.3	57.1	10	66.2	42.2	212
ID0026964U	12.177	7.87	0.00131	2.62	55.6	17.1	39.9	6.84	54.6	16	250
ID0027383D	12.457	8.08	0.00112	2.24	53.6	16.2	44.9	6.39	61.8	21.6	245
ID0027383U	12.446	8.05	0.00124	2.27	54.6	16.5	45.6	6.26	62.1	21.6	229
ID0028355D	12.142	8	0.00153	3.69	51.4	17.2	31.6	6.68	43.5	12.8	226
ID0028355U	11.034	8.41	0.00212	3.33	54	20.4	21.8	2.91	33.4	6.21	230
ID0020231D	8.576	8.09	0.000273	1.85	1.86	0.306	0.959	0.359	0.047	0.452	7.6
ID0020231U	8.727	7.64	0.000244	1.85	1.86	0.28	0.944	0.32	0.047	0.325	7.2
ID0023167D	8.265	7.82	0.000354	3.06	3.1	0.599	2.9	0.709	0.047	1.8	15.7
ID0023167U	8.633	7.75	0.00036	2.96	3.09	0.586	2.48	0.661	0.047	1.32	14.6
ID0022004D	11.171	8.3	0.000553	1.25	41.9	17.4	26	5.37	51.9	26.8	169
ID0022004U	11.151	8.26	0.000551	1.31	41.6	17.2	25.9	5.13	51.8	26.9	167

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0000213D	10.891	8.02	0.000418	2.14	16	3	12	1.66	0.047	2.61	74.8
ID0000213U	10.641	7.91	0.000405	2.21	16	2.91	11.6	1.53	0.047	2.21	73.1
ID0020338D	11.828	8.37	0.000491	1.75	43.3	17.4	31.9	6.03	63.2	27.2	176
ID0020338U	12.015	8.4	0.00052	1.79	44	17.9	33.8	6.3	64.8	27.2	191
ID0020389D	10.08	7.8	0.00039	2.11	15.1	2.51	9.7	1.33	0.047	2.06	66.4
ID0020389U	10.001	7.94	0.000385	2.08	14.4	2.38	9.65	1.3	0.047	1.93	64.1
ID0020427D	11.861	8.41	0.000486	1.57	43.4	18	29.5	6.08	57.3	26.8	178
ID0021199D	10.561	7.9	0.00039	2.3	16.5	2.99	12	1.61	0.047	2.26	73
ID0021199U	10.392	7.85	0.000381	2.15	16.3	2.92	11.6	1.55	0.047	2.19	71.3
ID0027979D	7.7	8.12	2.00E-04	1.41	15	1.28	4.13	0.53	0.047	0.848	49.3
ID0027979U	7.5	7.9	0.000155	1.28	15.8	1.27	4.17	0.509	0.047	0.799	51.2
ID0023159D	7.526	7.61	0.00108	5.43	7.6	2.52	5.92	2.29	0.047	4.08	36.6
ID0023159U	6.65	7.61	0.00145	6.55	8.69	3.08	6.19	2.86	0.047	2.42	45.6
ID0000060D	9.97	8.04	0.000621	0.549	18.4	4.98	5.23	1.12	26.5	6.53	49
ID0000060U	9.74	7.85	0.000547	0.464	18.5	4.96	5.34	1.13	27	6.66	48.5
ID0000159D	9.96	8.02	0.000572	0.54	18.4	4.95	5.24	1.12	26.8	6.58	50.1
ID0000159U	9.83	7.83	0.000598	0.516	18.5	5	5.38	1.12	26.4	6.51	50
ID0000167D	1.78	8.12	0.000319	0.385	9.72	2.66	1.1	0.354	0.047	0.192	35.5
ID0000167U	6.31	7.44	0.000252	0.348	3.46	1.04	0.878	0.225	0.047	0.159	14.4

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0020567D	9.01	7.87	0.000216	0.416	9.58	3.58	1.12	0.377	11.8	0.326	30.4
ID0020567U	8.82	7.81	0.000111	0.405	9.1	3.35	1.08	0.379	0.047	0.304	30.3
ID0021296D	8.49	7.43	0.000739	0.705	19.7	3.93	8.57	2.06	36	12.4	40
ID0021296U	8.58	7.36	0.00101	0.859	19.3	3.92	8.48	1.99	37.3	12.3	40.8
ID0025429D	8.98	8.21	0.000574	0.493	17.2	4.33	4.66	0.886	17.1	5.04	48.6
ID0025429U	8.68	8.22	0.000491	0.464	17.3	4.38	4.85	0.967	23.1	6.43	46.8
ID0020117D	10.54	7.31	0.00062	0.66	23.2	7.1	5.09	1.35	59.7	5.91	41.4
ID0020117U	10.46	7.51	0.000571	0.644	35.6	10.3	4.37	1.49	111	4.27	39.2
ID0022071D	9.42	7.61	0.000477	0.585	18.6	5.25	4.97	1.06	28	5.88	50
ID0022071U	9.16	7.76	0.000582	0.664	17.4	4.8	4.94	1.09	25.3	6.16	49.1
ID0022845D	8.47	7.94	0.000309	1.65	6.34	1.25	2.06	1.02	0.047	0.719	24
ID0025071D	8.41	7.57	0.000496	2.81	5.36	1.61	3.02	1.14	0.047	1.43	25.3
ID0025071U	8.36	7.93	0.00038	2.27	5.47	1.63	3.11	1.12	0.047	1.27	25.8
ID0022845U	7.97	8.54	0.000249	1.6	7.35	1.39	2.07	1.11	0.047	0.732	26.1
ID0024627D	13.72	7.92	0.00049	1.29	4.82	1.34	1.29	0.489	0.047	0.858	17.8
ID0020681D	11.5	8.25	0.000524	1.28	19.1	4.96	2.24	0.637	0.047	0.96	65.3
ID0020681U	11.56	8.23	0.000611	1.26	20.3	5.25	2.34	0.684	0.047	1.03	78
ID0020800D	11.2	7.78	0.000289	1.68	5.15	1.5	1.26	0.444	0.047	0.305	20.9
ID0020800U	11.18	8.05	0.000132	0.865	2.5225	0.741975	0.526975	0.240785	0.03525	0.16025	11.095

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0021229D	9.62	8.49	0.000819	3.84	26.3	5.12	4.28	1.58	12.1	3.87	85.8
ID0027944D	11.26	8.4	0.000658	1.27	20.4	5.27	2.32	0.65	0.047	1.03	77
ID0027944U	11.33	8.49	0.000558	1.31	20.2	5.19	2.33	0.645	0.047	1.04	77.7
ID0020451D	8.56	8.29	0.000316	1.54	20.2	5.46	2.14	0.487	14	1.32	69.2
ID0020222D	8.57	8.13	0.000311	1.57	20.4	5.51	2.16	0.486	14.1	1.34	69.1
ID0020222U	8.51	8.19	0.000326	1.56	21.2	5.9	2.09	0.479	14.1	1.35	68.7
ID0024350D	7.11	7.15	0.000238	1.77	1.63	0.302	1.63	0.307	0.047	1.29	6.5
ID0024350U	6.96	8.7	0.000134	1.74	1.65	0.309	1.59	0.312	0.047	1.25	6.5
ID0020451U	NA	NA	0.000316	1.58	20.3	5.49	2.15	0.491	14.2	1.33	69
ID0021229D2	8.45	7.75	0.00152	8.11	33.9	5.09	6.19	2.67	26.5	8.71	84.2
ID0021229U	8.25	7.72	0.00156	7.74	31.6	4.71	3.1	2.08	20.3	4.01	80.8
ID0027995D	11.16	8.05	0.000422	1.15	24.6	6.41	2.6	0.745	0.047	1.16	87.4
ID0027995U	11.22	8.23	0.00043	1.33	23.7	6.15	2.52	0.71	0.047	1.11	88.3
ID0028321D	5.8	7.32	0.00286	0.939	12.6	1.47	3.09	0.897	0.047	0.722	39.4
PantherCKD	7.49	8.12	0.000511	1.46	13.1	2.94	3.65	1.34	11.5	0.967	42.3
PantherCKD2	10.64	8.57	0.000952	1.47	11.1	2.26	4.16	1.34	0.047	1.04	36.8
PantherCKU	7.04	8.15	0.000375	1.51	11.8	2.57	3.7	1.07	0.047	0.801	45.5
PantherCKU2	10.5	8.55	0.000674	1.52	10.6	2.32	4.14	1.39	10.3	1.32	37
SFDeerCKD	5.27	8.02	0.00665	0.642	25.2	2.21	2.66	1.53	10.2	0.867	69.8

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
SFDeerCKU	5.15	8.07	0.00071	0.621	26.9	1.9	2.65	1.34	0.047	0.703	74
ID0020001D	11.47	8.94	0.000317	1.37	34.3	8	11.4	2	17.5	3.82	120
ID0020001U	11.4	8.93	0.000347	1.26	31.8	7.17	9.56	1.69	14.5	3.1	121
ID0023027U	14.67	8.17	0.000615	0.895	34.4	8.89	4.62	1.18	16.7	2.46	119
ID0028321U	5.61	7.59	0.00242	0.911	12.6	1.43	3.19	0.874	0.047	0.663	39.3
ID0020010U	15.25	7.97	0.00026	1.47	45.4	11.5	12.2	2.23	46.1	12.7	130
ID0020010D	14.93	8.16	0.000226	1.4	44.6	11	11.7	2.12	46.2	12.7	123
ID0020401D	14.32	8.38	0.000157	1.04	11.6	3.3	14	2.52	15.3	5.85	54.7
ID0020401U	13.47	8.23	0.000223	1.07	11.8	3.42	14.2	2.6	0.047	5.64	62
ID0026913D	13.58	7.01	0.000869	14.2	38.4	38.9	45	12.4	107	40	240
ID0026913U	13.12	6.37	0.000322	4.5	57.7	18.7	22.9	3.91	47.4	17.4	216
ID0020141U	14.43	7.5	1.00E-04	0.584	58.4	12.9	1.31	0.737	0.047	2.09	189
ID0020141D	13.55	7.54	0.00161	3.45	58.8	14.4	20.8	6.05	11.8	24.5	196
ID0023710D	11.77	7.74	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023710D2	NA	NA	0.000915	5.98	15.5	3.62	26.6	5.64	0.047	14.5	99.2
ID0023027D	14.54	8.5	0.000336	0.887	35.4	8.87	4.63	1.18	26.9	2.48	107
ID0020737D	14.6	8.5	0.000306	1.18	14.1	2.31	3.33	1.27	0.047	0.358	48.7
ID0020737U	17.3	8.3	0.000351	1.16	17.4	3.31	6.02	1.14	0.047	1.51	64
ID0020931D	16.8	8.3	3.00E-04	1.14	17.5	3.3	6.09	1.15	0.047	1.4	63.9

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0026077D	8.2	7.4	0.000184	1.44	5.37	0.361	2.62	0.464	0.047	0.361	19.8
ID0026077U	8.5	7.5	0.000217	1.47	4.78	0.367	2.53	0.455	0.047	0.403	19.4
ID0020931U	16.7	8.4	0.000442	1.16	17.1	3.22	5.91	1.14	0.047	1.44	63.7
ID0020362D	13.1	7.4	0.000248	2.24	3.12	0.828	2.17	0.855	0.047	0.856	15.8
ID0020362U	12.3	7.4	0.00029	7.58	3.17	0.838	2.19	0.856	0.047	0.931	16.7
ID0020532D	16.2	7.7	0.000427	3.25	7.48	2.22	3.68	2.09	0.047	1.82	35.1
ID0020532U	18	8.9	0.000544	2.37	5.32	1.4	2.5	1.32	0.047	1.03	23.7
ID0020788D	14.7	7.6	0.000333	1.3	15.8	9.61	14.8	2.37	0.047	12.3	94.2
ID0022861D	13.6	7.2	0.000489	4.05	6.61	2.33	4.74	1.53	0.047	5.65	30.4
ID0022861U	13.8	7.4	0.000323	3.85	6.66	2.34	4.6	1.46	0.047	3.07	31.7
ID0023761D	15.9	8	0.000617	2.18	12.9	4.62	6	2.65	0.047	2.3	68.2
ID0023761U	15.7	7.9	0.000659	2.13	13.4	4.88	6.04	2.82	0.047	2.35	68.2
ID0024554D	17.1	7.9	0.00075	1.87	10.3	3.69	5.07	2.05	0.047	1.89	52
ID0024554U	17.1	8.7	0.000665	1.97	9.45	3.4	4.75	1.9	0.047	1.35	48.9
ID0020206D	14.9	7.7	0.000265	1.88	5.17	1.38	2.85	0.921	0.047	1.14	25.1
ID0020206U	14.8	7.6	0.000224	1.95	4.85	1.27	2.61	0.812	0.047	0.931	22.5
ID0020354D	13.4	7.5	0.000588	5.08	23.6	10.8	36.1	8.14	0.047	76.8	98.5
ID0020354U	13.3	7.5	0.00125	7.51	14.3	5.28	10.4	2.89	0.047	26.5	52.6
ID0020893D	13.9	7.6	0.000211	2.49	8.64	2.39	3.33	1.31	0.047	0.467	40.5

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0020893U	13.7	7.9	0.000243	2.68	8.12	2.23	3.2	1.26	0.047	0.369	40
ID0023914D	13.2	7.2	0.000331	3.19	5.11	1.43	5.69	0.942	0.0235	1.24	32.9
ID0023914U	11.5	7.3	0.000339	3.05	8.31	2.1	5.84	1.85	0.047	2.53	42.5
ID0020125D	8.3	7.7	0.000464	1.92	49.1	15.9	22.3	4.44	14.7	17	210
ID0020125U	10.7	7.7	0.00146	4	36	12.1	20.3	4.92	11.3	4.22	182
ID0023604D	12.5	7.7	0.00612	8.41	18.8	5.52	60.9	14	21.4	37.6	123
ID0023604U	11	7	0.000741	2.175	16.55	5.605	10.1	3.13	0.047	20.55	60
ID0022501D	13.9	7.6	0.000591	3.28	8.2	2.48	4.68	2.09	0.047	2.21	41
ID0022501U	15.5	7.9	0.000588	3.22	7.4	2.19	4.19	1.96	0.047	2.04	36.7
ID0025607U	12	7.7	0.000347	1.34	3.32	0.678	1.36	0.429	0.047	0.43	12.3
ID0026310D	10.2	7.7	0.000631	2.1	38.1	11.3	17.9	2.33	15.9	25.1	129
ID0026310U	10.6	7.4	0.000526	1.8	37	10.8	17.1	1.93	15.3	25.4	110
ID0026531D	12	7.9	0.000325	1.37	3.27	0.665	1.6	0.453	0.047	0.462	13.9
ID0026531U	11.7	8	0.000537	1.31	3.24	0.653	1.29	0.437	0.047	0.321	13.6
ID0027154D	17.6	7.7	0.00314	4.13	31.4	11.2	92.8	16.3	50.8	106	141
ID0027154U	12.3	7.6	0.00106	3.44	41.2	13.2	36.3	5.2	15.1	35.9	191
ID0020036D	16.2	7.7	0.00315	3.91	23.5	8.55	33.1	10.8	18.4	28.5	115
ID0020699D	11	8.2	0.000319	3.3	5.49	0.972	3.19	0.718	0.047	0.569	21.7
ID0020699U	9	7.9	0.000304	3.12	6.58	1.06	3.63	0.667	0.047	0.474	23.6

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0021849U	11.3	8.3	0.00225	3.58	53.5	19.5	38.5	4.85	18.3	45.1	204
ID0022012D	10	7.4	0.00405	4.74	3.24	0.99	2.68	1.17	0.047	0.989	15
ID0022012U	9.4	7.4	0.000389	4.545	3.07	0.9355	2.535	1.085	0.047	0.882	15.15
ID0020711D	17.4	8.7	0.000214	1.58	3.8	0.62	1.97	0.491	0.047	0.325	16
ID0020711U	17.6	8.8	0.000295	1.6	3.87	0.627	2	0.493	0.047	0.318	17.8
ID0020249D	12.79	8	0.00048	2.85	63.4	28	35.1	10.9	39.8	49.5	255
ID0020249U	14.06	8.03	0.000326	1.73	50.9	26.4	26.8	6.48	28	40.9	233
ID0001198D	14.24	7.7	0.000312	1.36	75.3	71	23.4	10.2	34.2	11.1	474
ID0001198U	16.41	6.8	0.000236	0.924	75.7	66.8	21.7	10	39.6	9.95	478
ID0025585D	15.44	8.51	0.000385	2.98	47.1	41.4	33.4	4.75	111	46.4	230
ID0025585U	13.92	8.46	0.000347	2.91	40.3	41.3	34.7	4.74	88	49.5	239
ID0023825D	14.54	8.19	0.000366	2.98	41.6	44	33.9	5.29	77.7	37.9	228
ID0023825U	13.82	7.93	0.000305	3.05	41.2	43.5	33.6	5.23	69.5	37.8	240
ID0025143U	12.41	8.01	6.00E-04	2.78	70.3	23.1	15.7	2.91	56.7	15.2	228
ID0025194D	16.65	7.74	0.000337	1.95	85.4	35.4	35.5	13.4	47.8	38.1	350
ID0025194U	15.53	7.61	0.000298	1.9	86	35.6	36.3	13.7	49	39.5	350
ID0025143D	9.42	8	0.000195	0.954	66	16.5	3.63	1.21	77.6	2.78	155
ID0025569D	12.11	7.84	0.00075	2.9	47.5	16.9	17.7	4.57	17.7	14.9	195
ID0025569U	13.02	7.65	0.000479	2.23	48.6	16.9	16.5	4.24	17.7	13.9	201

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0026085D	12.79	8.08	0.0013	2.89	10.8	7.9	8.31	1.37	87.2	64.9	288
ID0026085U	12.92	8.02	0.000519	2.91	57.2	40.1	39.4	8.92	97.1	56.5	278
ID0020133U	11.21	7.54	0.000208	1.3	40.2	10.3	13.7	2.67	19.5	11.3	128
ID0020133D	11.35	7.8	0.000345	1.34	39.9	10.3	14.4	2.78	19.2	12	128
ID0024988D	12.44	8.19	0.000224	1.36	40.5	10.6	14	2.77	31.7	11.1	134
ID0024988U	11.6	7.9	0.000283	1.36	40.1	10.3	13.7	2.71	33.2	11.5	125
ID0021822D	12.91	8.45	0.000246	1.63	88	34.4	36.4	13.1	57.9	45.9	366
ID0021822U	13.23	8.34	0.000268	1.71	86.4	32.8	45.1	16.4	52.4	49.8	386
ID0024422U	9.04	8.29	0.000327	0.625	34.2	6.52	4.95	0.767	12.3	3.14	111
ID0024422D	NA	NA	0.000294	NA	34.7	6.65	5.06	0.789	12.5	3.3	108
ID0020061D	16.94	8.3	0.00101	2.89	59.7	23.6	32.7	5.14	68.1	31.1	213
ID0027928D	11.93	8.11	0.000178	0.539	34	5.5	4.83	0.615	0.047	1.91	103
ID0027928U	11.21	7.82	0.000238	0.532	31.6	4.99	4.24	0.555	0.047	2.02	106
ID0021211U	NA	NA	0.000551	2.99	29.8	7.54	5.64	1.45	11	2.95	111
ID0021211D	NA	NA	0.00056	3.16	30.2	7.59	5.68	1.79	10.9	3.24	108
ID0020940U	NA	NA	0.000403	2.12	40.4	14.7	17.2	3.65	42.3	16.2	136
ID0020940D	NA	NA	0.000385	2.08	38.1	14.1	18.5	3.55	41.3	18.1	144
ID0027120D	16.28	5.48	0.000487	2.35	36.1	13.3	15.4	3.58	40.6	15.9	127
ID0027120U	17.26	6.38	0.000518	2.39	36.7	13.4	15.3	3.52	40.3	15.7	120

DRAFT

MLOC_ID	TempC	pH	Cu_mgL	DOC_mgL	Ca_mgL	Mg_mgL	Na_mgL	K_mgL	SO4_mgL	Cl_mgL	Alk_mgLCaCO3
ID0020061U	16.88	8.21	0.000966	NA	56.9	23.3	31.6	5.31	79.5	29.8	209
ID0024422D2	9.49	8.17	NA	0.675	NA	NA	NA	NA	NA	NA	NA
ID0000388D	15.75	6.23	0.000844	2.28	66.5	23.4	31.8	6.05	97.1	34.4	213
ID0000388U	15.71	6.05	0.000665	2.27	67.1	22.7	31	6.19	94.8	33.4	224
ID0023728D	17.76	6.71	0.000732	2.25	33.7	13.8	15.4	3.57	41.7	16.1	127
ID0023728U	17.74	6.67	0.000574	2.13	37.2	13.8	15.6	3.59	41.4	15.9	126
ID0020753U	NA	NA	0.000382	1.68	42.3	13.2	16.7	3.24	39.9	15.9	143
ID0020753D	13.09	8.41	0.000315	1.62	42.9	13.7	17.3	3.43	40	16.7	140
ID0022047D	10.75	8.47	0.000582	3.27	70.5	25.9	26.3	9.61	24.2	67	265
ID0022047U	10.44	9.44	0.000751	4.09	75.9	26.6	45.2	18.7	40.4	104	258

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0020036U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027952D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027952U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020427U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021016D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021016U	0	NA	0	0	0	0	0	0	0
ID0021202D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021202U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0001155D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0001155U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020087D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020087U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021806D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021806U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020311D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020311U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021024D	0.000116	NA	0	0	0	0	0	0	0
ID0021024U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021831D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0021831U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025488D	0	NA	0	0	0	0	0	0	0
ID0025488U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028312D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028312U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021776D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021776U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026964D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026964U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027383D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027383U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028355D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028355U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020231D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020231U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023167D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023167U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022004D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022004U	0	NA	0	0	0	0	0	0	0

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0000213D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000213U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020338D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020338U	0	NA	0	0	0	0	0	0	0
ID0020389D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020389U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020427D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021199D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021199U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027979D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027979U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023159D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023159U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000060D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000060U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000159D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000159U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000167D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000167U	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0020567D	0.00411	0.235	0	0	0	0	0	0	0
ID0020567U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021296D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021296U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025429D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025429U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020117D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020117U	0	0.208	0	0	0	0	0	0	0
ID0022071D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022071U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022845D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025071D	0	0	0	0	0	0	0	0	0
ID0025071U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022845U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024627D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020681D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020681U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020800D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020800U	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0021229D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027944D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027944U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020451D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020222D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020222U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024350D	0	0	0	0	0	0	0	0	0
ID0024350U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020451U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021229D2	0	0	0	0	0	0	0	0	0
ID0021229U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027995D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027995U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028321D	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKD	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKD2	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKU	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKU	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
2									
SFDeerCKD	NA	NA	NA	NA	NA	NA	NA	NA	NA
SFDeerCKU	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020001D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020001U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023027U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028321U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020010U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020010D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020401D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020401U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026913D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026913U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020141U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020141D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023710D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023710D2	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023027D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020737D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0020737U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020931D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026077D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026077U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020931U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020362D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020362U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020532D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020532U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020788D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022861D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022861U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023761D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023761U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024554D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024554U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020206D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020206U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020354D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0020354U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020893D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020893U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023914D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023914U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020125D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020125U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023604D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023604U	0.000314	0	0	0	0.306	0	0	0	0
ID0022501D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022501U	0.00486	0	0	0	0.284	0	0	0	0
ID0025607U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026310D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026310U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026531D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026531U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027154D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027154U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020036D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0020699D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020699U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021849U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022012D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022012U	0	0	0	0	0.281	0	0	0	0
ID0020711D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020711U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020249D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020249U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0001198D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0001198U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025585D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025585U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023825D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023825U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025143U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025194D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025194U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025143D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0025569D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025569U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026085D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026085U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020133U	0	0	0.163	0	0.122	0	0	0	0
ID0020133D	0.000115	0	0.147	0	0.127	0	0	0	0
ID0024988D	0	0	0.135	0	0.119	0	0	0	0
ID0024988U	0	0	0.149	0	0.115	0	0	0	0
ID0021822D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021822U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024422U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024422D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020061D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027928D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027928U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021211U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021211D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020940U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020940D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_BLANK	DOC_mgL_BLANK	Ca_mgL_BLANK	Mg_mgL_BLANK	Na_mgL_BLANK	K_mgL_BLANK	SO4_mgL_BLANK	Cl_mgL_BLANK	Alk_mgLCaCO3_BLANK
ID0027120D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027120U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020061U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID00244222	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000388D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000388U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023728D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023728U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020753U	0	0	0	0	0.113	0	0	0	0
ID0020753D	0	0.236	0	0	0	0	0	0	0
ID0022047D	0.000374	0	0	0	0	0	0.047	0	0
ID0022047U	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0020036U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027952D	0.00187	NA	13.8	2.19	6.12	1.24	0.047	2.53	49.6
ID0027952U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020427U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021016D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021016U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021202D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021202U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0001155D	0.000812	NA	38.7	16	31.7	5.76	48.5	18.9	163
ID0001155U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020087D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020087U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021806D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021806U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020311D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020311U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021024D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021024U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021831D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0021831U	0.000797	NA	18.4	3.51	14.1	1.97	11.9	9.09	70.6
ID0025488D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025488U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028312D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028312U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021776D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021776U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026964D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026964U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027383D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027383U	0.00203	NA	53	16	43.9	6.25	62.1	21.6	236
ID0028355D	0.00149	NA	51.2	17.2	31.7	6.67	43	12.7	224
ID0028355U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020231D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020231U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023167D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023167U	0.000349	NA	2.98	0.578	2.5	0.636	0.047	1.41	15.8
ID0022004D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022004U	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0000213D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000213U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020338D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020338U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020389D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020389U	0.000358	NA	14.7	2.39	9.74	1.32	0.047	1.91	65
ID0020427D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021199D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021199U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027979D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027979U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023159D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023159U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000060D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000060U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000159D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000159U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000167D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000167U	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0020567D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020567U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021296D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021296U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025429D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025429U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020117D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020117U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022071D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022071U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022845D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025071D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025071U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022845U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024627D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020681D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020681U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020800D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020800U	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0021229D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027944D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027944U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020451D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020222D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020222U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024350D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024350U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020451U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021229D2	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021229U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027995D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027995U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028321D	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKD	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKD2	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKU	NA	NA	NA	NA	NA	NA	NA	NA	NA
PantherCKU	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
2									
SFDeerCKD	NA	NA	NA	NA	NA	NA	NA	NA	NA
SFDeerCKU	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020001D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020001U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023027U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0028321U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020010U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020010D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020401D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020401U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026913D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026913U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020141U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020141D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023710D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023710D2	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023027D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020737D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0020737U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020931D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026077D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026077U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020931U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020362D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020362U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020532D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020532U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020788D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022861D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022861U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023761D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023761U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024554D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024554U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020206D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020206U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020354D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0020354U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020893D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020893U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023914D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023914U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020125D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020125U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023604D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023604U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022501D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022501U	0.00058	3.18	7.65	2.27	4.3	2.02	0.047	2.16	27.3
ID0025607U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026310D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026310U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026531D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026531U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027154D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027154U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020036D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0020699D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020699U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021849U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022012D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022012U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020711D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020711U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020249D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020249U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0001198D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0001198U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025585D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025585U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023825D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023825U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025143U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025194D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025194U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025143D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0025569D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0025569U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026085D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0026085U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020133U	0.000207	1.32	40.5	10.4	13.7	2.7	18.9	10.8	127
ID0020133D	0.000262	1.37	39.8	10.3	14.4	2.79	18.3	11.2	125
ID0024988D	0.000224	1.39	39.1	10.2	13.7	2.66	19.6	11.1	123
ID0024988U	0.000247	1.33	40.2	10.4	13.7	2.71	32.5	11.3	127
ID0021822D	0.000301	1.59	86.1	33.9	35.6	13.4	56.1	45	400
ID0021822U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024422U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0024422D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020061D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027928D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027928U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021211U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0021211D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020940U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020940D	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

MLOC_ID	Cu_mgL_DUP	DOC_mgL_DUP	Ca_mgL_DUP	Mg_mgL_DUP	Na_mgL_DUP	K_mgL_DUP	SO4_mgL_DUP	Cl_mgL_DUP	Alk_mgLCaCO3_DUP
ID0027120D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0027120U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020061U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID00244222	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000388D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0000388U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023728D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0023728U	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0020753U	0.000319	1.66	43.5	13.7	17.2	3.39	40.2	16	147
ID0020753D	3.00E-04	1.6	42.9	13.7	17.2	3.41	40.4	16.8	141
ID0022047D	NA	NA	NA	NA	NA	NA	NA	NA	NA
ID0022047U	NA	NA	NA	NA	NA	NA	NA	NA	NA

DRAFT

~~Appendix B.~~Appendix C. Biotic Ligand Model Inputs and Criteria Outputs

DRAFT

Ver 3.1.2.12g, build 2015-10-12

C:\Program Files (x86)\Biotic Ligand Model - Research Mode\Model\CuOH5%le_10-11-07.DAT

C:\Users\jpappani\Documents\Pappani\WQS\Cu BLM\Monitoring\Data Analysis\FallMonitoringBLMrun05252017.blm

/S C:\USERS\JPAPPANI\DOCUMENTS\PAPPANI\WQS\CU BLM\MONITORING\DATA ANALYSIS\FALLMONITORINGBLMRUN05252017.SCR, /W /Q /VER3.1 /O3 /K1 /L

Site Label	Sample Label	Final Acute Value	CMC	CCC	Cu	Acute Toxic Units	Chronic Toxic Units	Censored Flag
		(FAV), ug/L	(CMC=FAV/2), ug/L	(CCC=FAV/ACR), ug/L	ug/L	(Acute TU=Cu/CMC)	(Chronic TU=Cu/CCC)	(0 = quantified, 1 = BDL)
"ID0020036U"	"9/25/2016"	26.59	13.30	8.26	0.81	0.06	0.10	0.00
"ID0027952D"	"9/28/2016"	42.11	21.05	13.08	1.95	0.09	0.15	0.00
"ID0027952U"	"9/28/2016"	62.38	31.19	19.37	1.96	0.06	0.10	0.00

DRAFT

"ID0020427U"	"9/29/2016"	36.46	18.23	11.32	0.43	0.02	0.04	0.00
"ID0021016D"	"9/29/2016"	51.56	25.78	16.01	0.96	0.04	0.06	0.00
"ID0021016U"	"9/29/2016"	46.11	23.05	14.32	1.11	0.05	0.08	0.00
"ID0021202D"	"9/29/2016"	1.93	0.96	0.60	0.37	0.38	0.62	0.00
"ID0021202U"	"9/29/2016"	35.02	17.51	10.88	0.42	0.02	0.04	0.00
"ID0001155D"	"10/4/2016"	49.94	24.97	15.51	0.83	0.03	0.05	0.00
"ID0001155U"	"10/4/2016"	49.85	24.92	15.48	0.67	0.03	0.04	0.00
"ID0020087D"	"10/4/2016"	41.54	20.77	12.90	0.70	0.03	0.05	0.00
"ID0020087U"	"10/4/2016"	40.39	20.20	12.54	0.69	0.03	0.06	0.00
"ID0021806D"	"10/4/2016"	34.82	17.41	10.81	0.77	0.04	0.07	0.00
"ID0021806U	"10/4/2016	37.46	18.73	11.63	0.75	0.04	0.06	0.00

DRAFT

"	"							
"ID0020311D "	"10/5/2016 "	31.32	15.66	9.73	0.23	0.02	0.02	0.00
"ID0020311U "	"10/5/2016 "	26.72	13.36	8.30	0.23	0.02	0.03	0.00
"ID0021024D "	"10/5/2016 "	22.06	11.03	6.85	0.20	0.02	0.03	0.00
"ID0021024U "	"10/5/2016 "	22.57	11.29	7.01	0.19	0.02	0.03	0.00
"ID0021831D "	"10/5/2016 "	29.01	14.50	9.01	0.93	0.06	0.10	0.00
"ID0021831U "	"10/5/2016 "	33.52	16.76	10.41	0.77	0.05	0.07	0.00
"ID0025488D "	"10/13/2016 "	20.45	10.22	6.35	0.23	0.02	0.04	0.00
"ID0025488U "	"10/13/2016 "	20.20	10.10	6.27	0.30	0.03	0.05	0.00
"ID0028312D "	"10/13/2016 "	16.19	8.10	5.03	0.20	0.02	0.04	0.00
"ID0028312U "	"10/13/2016 "	15.63	7.81	4.85	0.24	0.03	0.05	0.00

DRAFT

"ID0021776D"	"10/18/2016"	42.35	21.18	13.15	2.01	0.09	0.15	0.00
"ID0021776U"	"10/18/2016"	39.54	19.77	12.28	2.77	0.14	0.23	0.00
"ID0026964D"	"10/18/2016"	51.85	25.92	16.10	2.07	0.08	0.13	0.00
"ID0026964U"	"10/18/2016"	38.99	19.50	12.11	1.31	0.07	0.11	0.00
"ID0027383D"	"10/18/2016"	41.30	20.65	12.83	1.12	0.05	0.09	0.00
"ID0027383U"	"10/18/2016"	40.78	20.39	12.66	1.24	0.06	0.10	0.00
"ID0028355D"	"10/18/2016"	58.98	29.49	18.32	1.53	0.05	0.08	0.00
"ID0028355U"	"10/18/2016"	73.03	36.52	22.68	2.12	0.06	0.09	0.00
"ID0020231D"	"10/19/2016"	29.39	14.69	9.13	0.27	0.02	0.03	0.00
"ID0020231U"	"10/19/2016"	18.67	9.33	5.80	0.24	0.03	0.04	0.00
"ID0023167D	"10/19/2016	35.14	17.57	10.91	0.35	0.02	0.03	0.00

DRAFT

"	"							
"ID0023167U "	"10/19/2016 "	31.49	15.75	9.78	0.36	0.02	0.04	0.00
"ID0022004D "	"10/20/2016 "	25.88	12.94	8.04	0.55	0.04	0.07	0.00
"ID0022004U "	"10/20/2016 "	26.08	13.04	8.10	0.55	0.04	0.07	0.00
"ID0000213D "	"10/25/2016 "	28.53	14.26	8.86	0.42	0.03	0.05	0.00
"ID0000213U "	"10/25/2016 "	26.41	13.20	8.20	0.41	0.03	0.05	0.00
"ID0020338D "	"10/25/2016 "	38.56	19.28	11.97	0.49	0.03	0.04	0.00
"ID0020338U "	"10/25/2016 "	41.02	20.51	12.74	0.52	0.03	0.04	0.00
"ID0020389D "	"10/25/2016 "	22.11	11.05	6.87	0.39	0.04	0.06	0.00
"ID0020389U "	"10/25/2016 "	25.06	12.53	7.78	0.38	0.03	0.05	0.00
"ID0020427D "	"10/25/2016 "	35.89	17.95	11.15	0.49	0.03	0.04	0.00

DRAFT

"ID0021199D"	"10/25/2016"	27.31	13.66	8.48	0.39	0.03	0.05	0.00
"ID0021199U"	"10/25/2016"	24.17	12.09	7.51	0.38	0.03	0.05	0.00
"ID0027979D"	"10/26/2016"	18.66	9.33	5.79	0.20	0.02	0.03	0.00
"ID0027979U"	"10/26/2016"	13.91	6.95	4.32	0.16	0.02	0.04	0.00
"ID0023159D"	"10/19/2016"	46.12	23.06	14.32	1.08	0.05	0.08	0.00
"ID0023159U"	"10/19/2016"	55.54	27.77	17.25	1.45	0.05	0.08	0.00
"ID0000060D"	"10/4/2016"	4.21	2.10	1.31	0.62	0.30	0.48	0.00
"ID0000060U"	"10/4/2016"	2.62	1.31	0.81	0.55	0.42	0.67	0.00
"ID0000159D"	"10/4/2016"	4.03	2.01	1.25	0.57	0.28	0.46	0.00
"ID0000159U"	"10/4/2016"	3.11	1.56	0.97	0.60	0.38	0.62	0.00
"ID0000167D	"10/4/2016	1.99	1.00	0.62	0.32	0.32	0.52	0.00

DRAFT

"	"							
"ID0000167U "	"10/4/2016 "	0.78	0.39	0.24	0.25	0.64	1.04	0.00
"ID0020567D "	"10/4/2016 "	1.96	0.98	0.61	0.22	0.22	0.36	0.00
"ID0020567U "	"10/4/2016 "	1.76	0.88	0.55	0.11	0.13	0.20	0.00
"ID0021296D "	"10/4/2016 "	3.21	1.60	1.00	0.74	0.46	0.74	0.00
"ID0021296U "	"10/4/2016 "	3.85	1.93	1.20	1.01	0.52	0.84	0.00
"ID0025429D "	"10/4/2016 "	3.98	1.99	1.24	0.57	0.29	0.46	0.00
"ID0025429U "	"10/4/2016 "	3.56	1.78	1.11	0.49	0.28	0.44	0.00
"ID0020117D "	"10/5/2016 "	2.70	1.35	0.84	0.62	0.46	0.74	0.00
"ID0020117U "	"10/5/2016 "	3.47	1.73	1.08	0.57	0.33	0.53	0.00
"ID0022071D "	"10/5/2016 "	3.22	1.61	1.00	0.48	0.30	0.48	0.00

DRAFT

"ID0022071U"	"10/5/2016"	4.50	2.25	1.40	0.58	0.26	0.42	0.00
"ID0022845D"	"10/6/2016"	19.07	9.54	5.92	0.31	0.03	0.05	0.00
"ID0022845U"	"10/6/2016"	28.50	14.25	8.85	0.25	0.02	0.03	0.00
"ID0025071D"	"10/6/2016"	22.36	11.18	6.95	0.50	0.04	0.07	0.00
"ID0025071U"	"10/6/2016"	26.57	13.29	8.25	0.38	0.03	0.05	0.00
"ID0024627D"	"10/19/2016"	15.17	7.58	4.71	0.49	0.06	0.10	0.00
"ID0020681D"	"10/25/2016"	19.91	9.95	6.18	0.52	0.05	0.08	0.00
"ID0020681U"	"10/25/2016"	19.43	9.72	6.04	0.61	0.06	0.10	0.00
"ID0020800D"	"10/25/2016"	16.76	8.38	5.21	0.29	0.03	0.06	0.00
"ID0020800U"	"10/25/2016"	12.18	6.09	3.78	0.13	0.02	0.03	0.00
"ID0021229D	"10/25/2016	69.87	34.93	21.70	0.82	0.02	0.04	0.00

DRAFT

"	"							
"ID0027944D "	"10/25/2016 "	22.22	11.11	6.90	0.66	0.06	0.10	0.00
"ID0027944U "	"10/25/2016 "	24.41	12.20	7.58	0.56	0.05	0.07	0.00
"ID0020222D "	"10/26/2016 "	21.30	10.65	6.61	0.31	0.03	0.05	0.00
"ID0020222U "	"10/26/2016 "	22.29	11.15	6.92	0.33	0.03	0.05	0.00
"ID0020451D "	"10/26/2016 "	23.62	11.81	7.33	0.32	0.03	0.04	0.00
"ID0024350D "	"10/26/2016 "	9.52	4.76	2.96	0.24	0.05	0.08	0.00
"ID0024350U "	"10/26/2016 "	40.40	20.20	12.55	0.13	0.01	0.01	0.00
"ID0021229D2 "	"10/27/2016 "	80.80	40.40	25.09	1.52	0.04	0.06	0.00
"ID0021229U "	"10/27/2016 "	72.91	36.45	22.64	1.56	0.04	0.07	0.00
"ID0027995D "	"10/27/2016 "	15.57	7.79	4.84	0.42	0.05	0.09	0.00

DRAFT

"ID0027995U"	"10/27/2016"	20.80	10.40	6.46	0.43	0.04	0.07	0.00
"ID0028321D"	"9/13/2016"	5.18	2.59	1.61	2.86	1.10	1.78	0.00
"PantherCKD"	"9/13/2016"	19.18	9.59	5.96	0.51	0.05	0.09	0.00
"PantherCKD2"	"9/13/2016"	27.86	13.93	8.65	0.95	0.07	0.11	0.00
"PantherCKU"	"9/13/2016"	20.47	10.24	6.36	0.38	0.04	0.06	0.00
"PantherCKU2"	"9/13/2016"	28.14	14.07	8.74	0.67	0.05	0.08	0.00
"SFDeerCKD"	"9/13/2016"	7.86	3.93	2.44	6.65	1.69	2.73	0.00
"SFDeerCKU"	"9/13/2016"	8.03	4.02	2.49	0.71	0.18	0.28	0.00
"ID0020001D"	"9/14/2016"	38.13	19.07	11.84	0.32	0.02	0.03	0.00
"ID0020001U"	"9/14/2016"	34.24	17.12	10.63	0.35	0.02	0.03	0.00
"ID0023027U	"9/16/2016	15.26	7.63	4.74	0.62	0.08	0.13	0.00

DRAFT

"	"							
"ID0028321U"	"9/16/2016"	7.03	3.51	2.18	2.42	0.69	1.11	0.00
"ID0020010D"	"9/19/2016"	24.64	12.32	7.65	0.23	0.02	0.03	0.00
"ID0020010U"	"9/19/2016"	21.81	10.90	6.77	0.26	0.02	0.04	0.00
"ID0020401D"	"9/19/2016"	19.79	9.89	6.15	0.16	0.02	0.03	0.00
"ID0020401U"	"9/19/2016"	18.05	9.02	5.61	0.22	0.02	0.04	0.00
"ID0026913D"	"9/19/2016"	77.39	38.70	24.04	0.87	0.02	0.04	0.00
"ID0026913U"	"9/19/2016"	8.84	4.42	2.74	0.32	0.07	0.12	0.00
"ID0020141D"	"9/21/2016"	33.92	16.96	10.53	1.61	0.09	0.15	0.00
"ID0020141U"	"9/21/2016"	6.34	3.17	1.97	0.10	0.03	0.05	0.00
"ID0023027D"	"9/26/2016"	19.85	9.92	6.16	0.34	0.03	0.05	0.00

DRAFT

"ID0020737D"	"9/6/2016"	22.78	11.39	7.07	0.31	0.03	0.04	0.00
"ID0020737U"	"9/6/2016"	20.79	10.40	6.46	0.35	0.03	0.05	0.00
"ID0020931D"	"9/6/2016"	20.28	10.14	6.30	0.30	0.03	0.05	0.00
"ID0020931U"	"9/6/2016"	22.35	11.18	6.94	0.44	0.04	0.06	0.00
"ID0026077D"	"9/6/2016"	9.26	4.63	2.87	0.18	0.04	0.06	0.00
"ID0026077U"	"9/6/2016"	10.87	5.44	3.38	0.22	0.04	0.06	0.00
"ID0020362D"	"9/7/2016"	15.27	7.64	4.74	0.25	0.03	0.05	0.00
"ID0020362U"	"9/7/2016"	55.63	27.82	17.28	0.29	0.01	0.02	0.00
"ID0020532D"	"9/7/2016"	30.41	15.21	9.44	0.43	0.03	0.05	0.00
"ID0020532U"	"9/7/2016"	63.93	31.97	19.85	0.54	0.02	0.03	0.00
"ID0020788D	"9/7/2016	12.21	6.11	3.79	0.33	0.05	0.09	0.00

DRAFT

"	"							
"ID0022861D "	"9/7/2016 "	20.19	10.09	6.27	0.49	0.05	0.08	0.00
"ID0022861U "	"9/7/2016 "	25.18	12.59	7.82	0.32	0.03	0.04	0.00
"ID0023761D "	"9/7/2016 "	28.65	14.33	8.90	0.62	0.04	0.07	0.00
"ID0023761U "	"9/7/2016 "	25.29	12.64	7.85	0.66	0.05	0.08	0.00
"ID0024554D "	"9/7/2016 "	22.12	11.06	6.87	0.75	0.07	0.11	0.00
"ID0024554U "	"9/7/2016 "	46.67	23.33	14.49	0.67	0.03	0.05	0.00
"ID0020206D "	"9/8/2016 "	17.64	8.82	5.48	0.26	0.03	0.05	0.00
"ID0020206U "	"9/8/2016 "	16.33	8.17	5.07	0.22	0.03	0.04	0.00
"ID0020354D "	"9/8/2016 "	46.18	23.09	14.34	0.59	0.03	0.04	0.00
"ID0020354U "	"9/8/2016 "	58.28	29.14	18.10	1.25	0.04	0.07	0.00

DRAFT

"ID0020893D"	"9/8/2016"	20.19	10.10	6.27	0.21	0.02	0.03	0.00
"ID0020893U"	"9/8/2016"	30.48	15.24	9.47	0.24	0.02	0.03	0.00
"ID0023914D"	"9/8/2016"	16.31	8.15	5.06	0.33	0.04	0.07	0.00
"ID0023914U"	"9/8/2016"	17.25	8.62	5.36	0.34	0.04	0.06	0.00
"ID0020125D"	"9/9/2016"	22.30	11.15	6.93	0.46	0.04	0.07	0.00
"ID0020125U"	"9/9/2016"	43.28	21.64	13.44	1.46	0.07	0.11	0.00
"ID0023604D"	"9/9/2016"	106.79	53.39	33.16	6.12	0.11	0.18	0.00
"ID0023604U"	"9/9/2016"	8.48	4.24	2.63	0.74	0.17	0.28	0.00
"ID0022501D"	"9/12/2016"	27.12	13.56	8.42	0.59	0.04	0.07	0.00
"ID0022501U"	"9/12/2016"	37.71	18.86	11.71	0.59	0.03	0.05	0.00
"ID0025607U	"9/12/2016	13.01	6.50	4.04	0.35	0.05	0.09	0.00

DRAFT

"	"							
"ID0026310D "	"9/12/2016 "	22.64	11.32	7.03	0.63	0.06	0.09	0.00
"ID0026310U "	"9/12/2016 "	13.77	6.89	4.28	0.53	0.08	0.12	0.00
"ID0026531D "	"9/12/2016 "	16.58	8.29	5.15	0.32	0.04	0.06	0.00
"ID0026531U "	"9/12/2016 "	17.44	8.72	5.42	0.54	0.06	0.10	0.00
"ID0027154D "	"9/12/2016 "	58.81	29.41	18.26	3.14	0.11	0.17	0.00
"ID0027154U "	"9/12/2016 "	36.43	18.21	11.31	1.06	0.06	0.09	0.00
"ID0020036D "	"9/25/2016 "	44.65	22.32	13.87	3.15	0.14	0.23	0.00
"ID0020699D "	"9/25/2016 "	50.92	25.46	15.81	0.32	0.01	0.02	0.00
"ID0020699U "	"9/25/2016 "	35.92	17.96	11.16	0.30	0.02	0.03	0.00
"ID0021849U "	"9/25/2016 "	75.45	37.72	23.43	2.25	0.06	0.10	0.00

DRAFT

"ID0022012D"	"9/25/2016"	33.34	16.67	10.35	4.05	0.24	0.39	0.00
"ID0022012U"	"9/25/2016"	32.06	16.03	9.96	0.39	0.02	0.04	0.00
"ID0020711D"	"10/5/2016"	37.81	18.90	11.74	0.21	0.01	0.02	0.00
"ID0020711U"	"10/5/2016"	40.77	20.39	12.66	0.29	0.01	0.02	0.00
"ID0020249D"	"9/15/2016"	49.80	24.90	15.47	0.48	0.02	0.03	0.00
"ID0020249U"	"9/15/2016"	31.39	15.70	9.75	0.33	0.02	0.03	0.00
"ID0001198D"	"9/19/2016"	25.81	12.90	8.02	0.31	0.02	0.04	0.00
"ID0001198U"	"9/19/2016"	9.78	4.89	3.04	0.24	0.05	0.08	0.00
"ID0025585D"	"9/19/2016"	84.19	42.09	26.14	0.38	0.01	0.01	0.00
"ID0025585U"	"9/19/2016"	76.44	38.22	23.74	0.35	0.01	0.01	0.00
"ID0023825D	"9/26/2016	63.59	31.80	19.75	0.37	0.01	0.02	0.00

DRAFT

"	"							
"ID0023825U "	"9/26/2016 "	50.72	25.36	15.75	0.31	0.01	0.02	0.00
"ID0025143D "	"9/26/2016 "	14.77	7.38	4.59	0.19	0.03	0.04	0.00
"ID0025143U "	"9/26/2016 "	45.72	22.86	14.20	0.60	0.03	0.04	0.00
"ID0025194D "	"9/26/2016 "	31.63	15.82	9.82	0.34	0.02	0.03	0.00
"ID0025194U "	"9/26/2016 "	26.83	13.42	8.33	0.30	0.02	0.04	0.00
"ID0025569D "	"10/3/2016 "	38.19	19.09	11.86	0.75	0.04	0.06	0.00
"ID0025569U "	"10/3/2016 "	24.62	12.31	7.65	0.48	0.04	0.06	0.00
"ID0026085D "	"10/3/2016 "	37.65	18.82	11.69	1.30	0.07	0.11	0.00
"ID0026085U "	"10/3/2016 "	53.35	26.67	16.57	0.52	0.02	0.03	0.00
"ID0020133D "	"10/10/2016 "	16.21	8.11	5.03	0.35	0.04	0.07	0.00

DRAFT

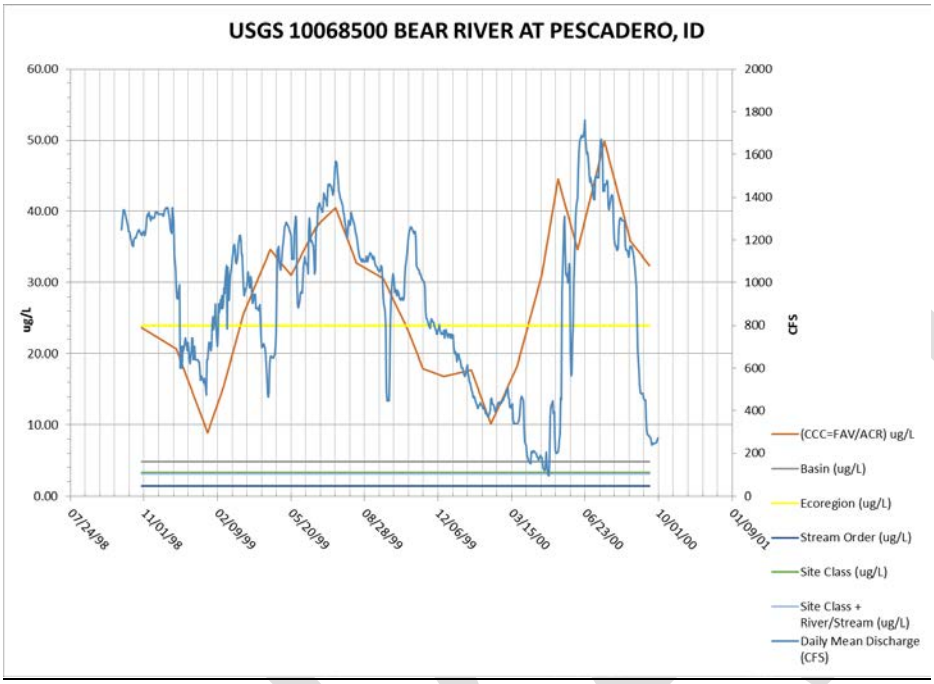
"ID0020133U"	"10/10/2016"	11.89	5.94	3.69	0.21	0.03	0.06	0.00
"ID0024988D"	"10/10/2016"	23.83	11.92	7.40	0.22	0.02	0.03	0.00
"ID0024988U"	"10/10/2016"	18.00	9.00	5.59	0.28	0.03	0.05	0.00
"ID0021822D"	"10/25/2016"	49.80	24.90	15.47	0.25	0.01	0.02	0.00
"ID0021822U"	"10/25/2016"	48.53	24.26	15.07	0.27	0.01	0.02	0.00
"ID0024422U"	"9/6/2016"	10.93	5.47	3.39	0.33	0.06	0.10	0.00
"ID0020061D"	"9/8/2016"	68.33	34.16	21.22	1.01	0.03	0.05	0.00
"ID0027928D"	"9/8/2016"	8.52	4.26	2.65	0.18	0.04	0.07	0.00
"ID0027928U"	"9/8/2016"	6.25	3.12	1.94	0.24	0.08	0.12	0.00
"ID0027120D"	"9/19/2016"	1.13	0.56	0.35	0.49	0.87	1.39	0.00
"ID0027120U	"9/19/2016	4.22	2.11	1.31	0.52	0.25	0.40	0.00

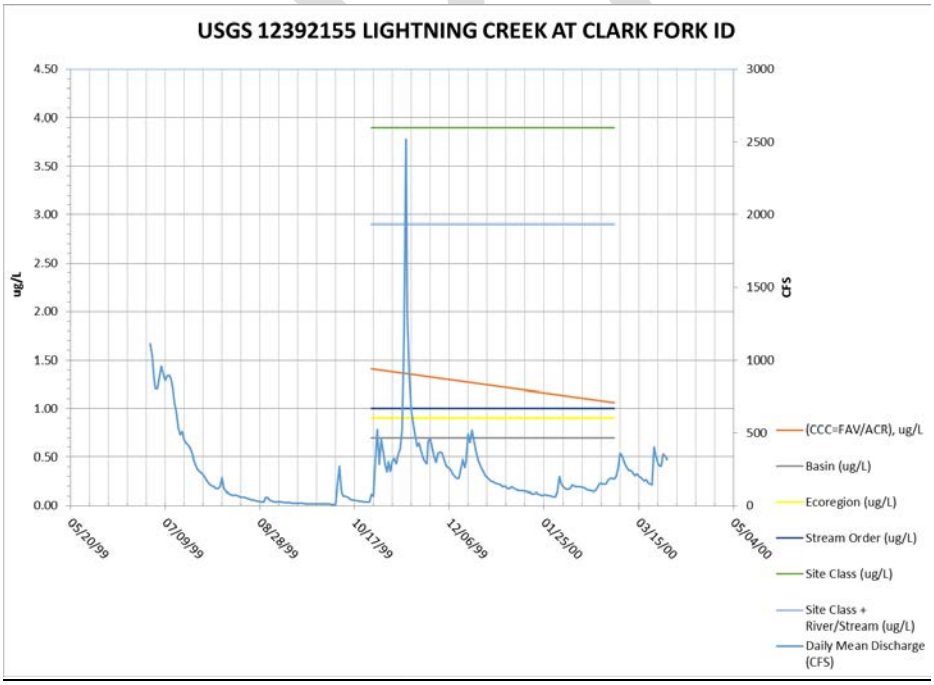
DRAFT

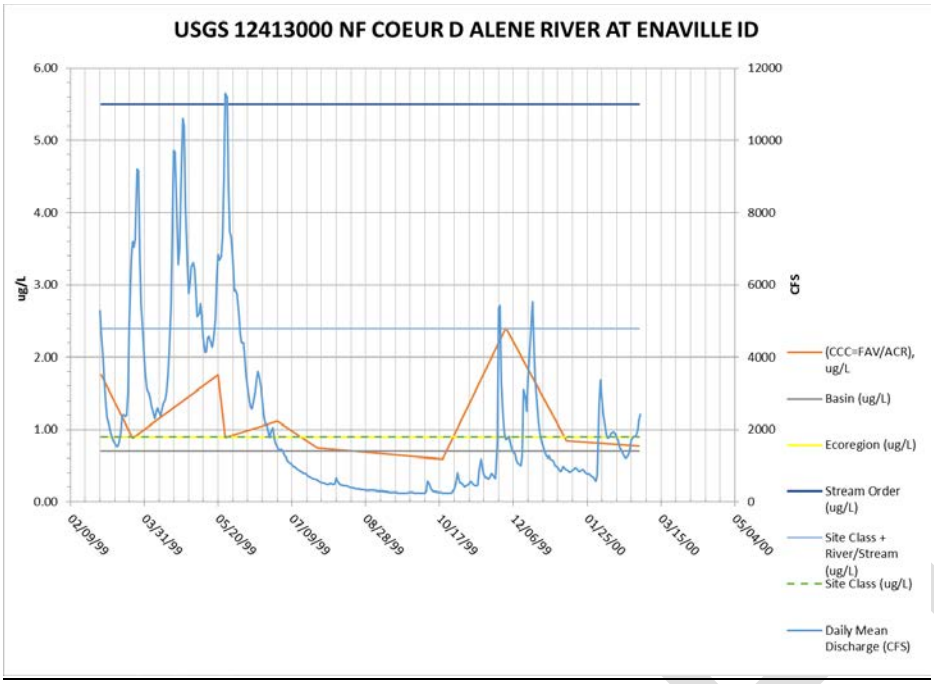
"	"							
"ID0000388D "	"9/20/2016 "	4.74	2.37	1.47	0.84	0.36	0.57	0.00
"ID0000388U "	"9/20/2016 "	3.82	1.91	1.19	0.67	0.35	0.56	0.00
"ID0023728D "	"9/20/2016 "	6.77	3.39	2.10	0.73	0.22	0.35	0.00
"ID0023728U "	"9/20/2016 "	6.16	3.08	1.91	0.57	0.19	0.30	0.00
"ID0020753D "	"10/10/2016 "	30.42	15.21	9.45	0.32	0.02	0.03	0.00
"ID0022047D "	"10/25/2016 "	79.35	39.67	24.64	0.58	0.01	0.02	0.00
"ID0022047U "	"10/25/2016 "	168.07	84.04	52.20	0.75	0.01	0.01	0.00

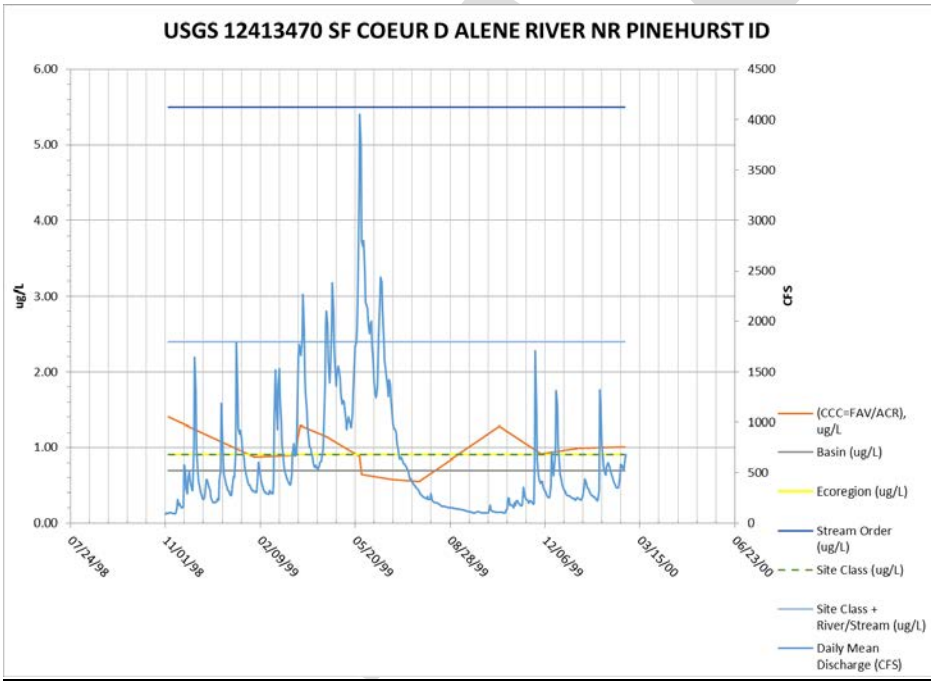
DRAFT

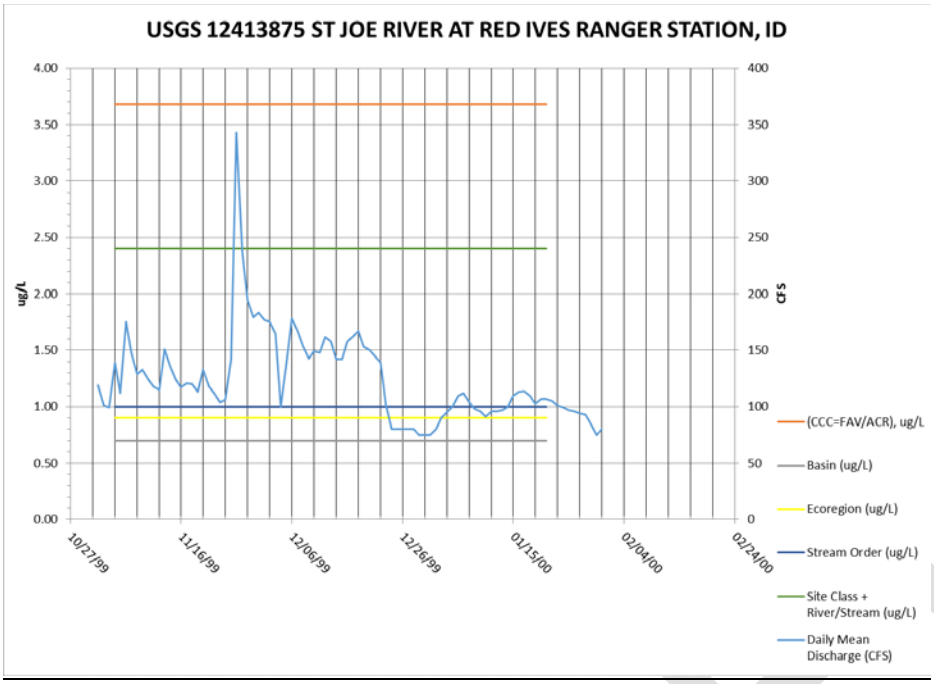
Appendix D. Comparison of Regional Classification 10th Percentile Criteria Estimates to BLM-Derived IWQCs and Discharge at USGS Sites

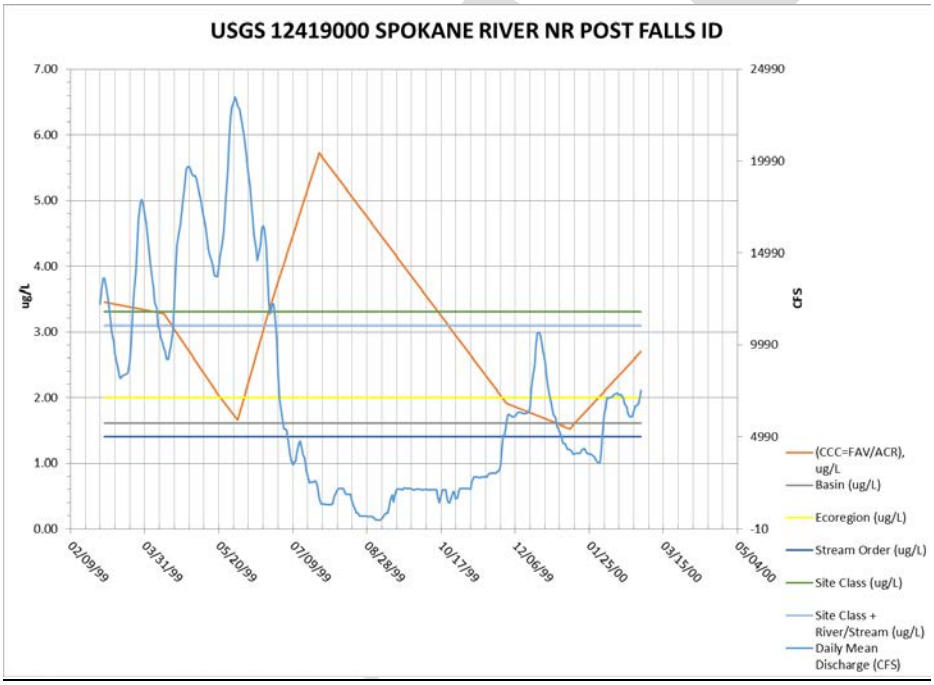


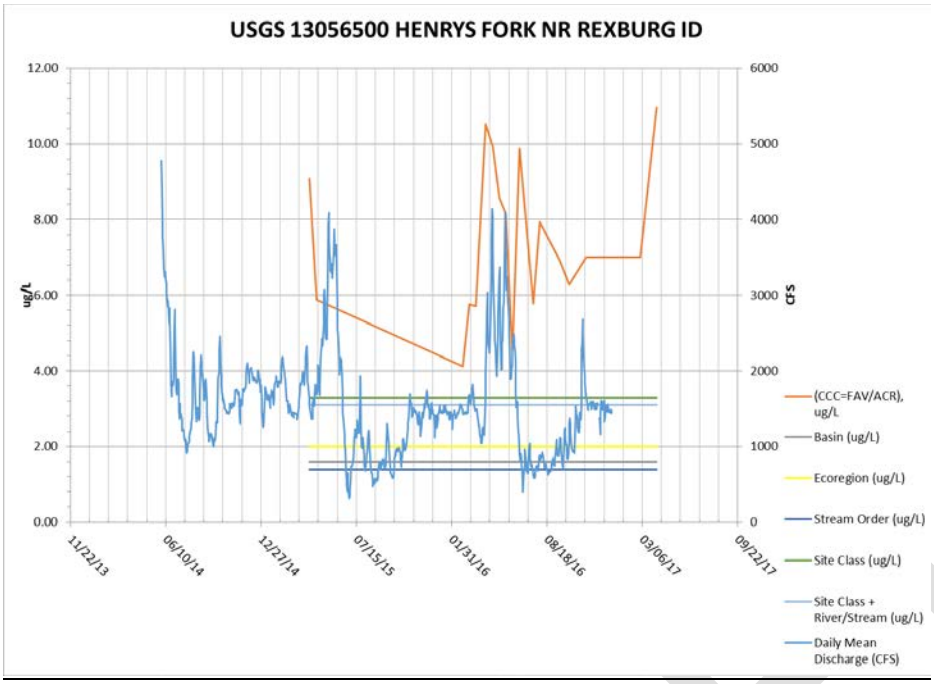


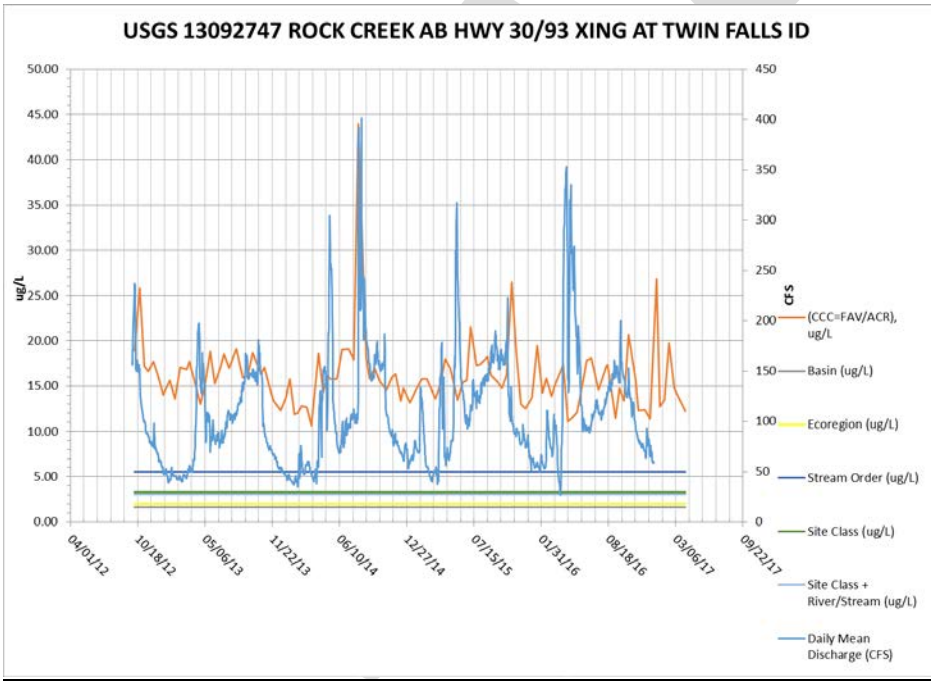

USGS 12413000 NF COEUR D ALENE RIVER AT ENAVILLE ID
ug/L
CFS
6.00
5.00
4.00
3.00
2.00
1.00
0.00
12000
10000
8000
6000
4000
2000
0
03/09/99
03/31/99
05/20/99
07/09/99
08/28/99
10/17/99
12/06/99
01/25/00
03/15/00
05/04/00
(CCC=FAV/ACR), ug/L
Basin (ug/L)
Ecoregion (ug/L)
Stream Order (ug/L)
Site Class + River/Stream (ug/L)
Site Class (ug/L)
Daily Mean Discharge (CFS)

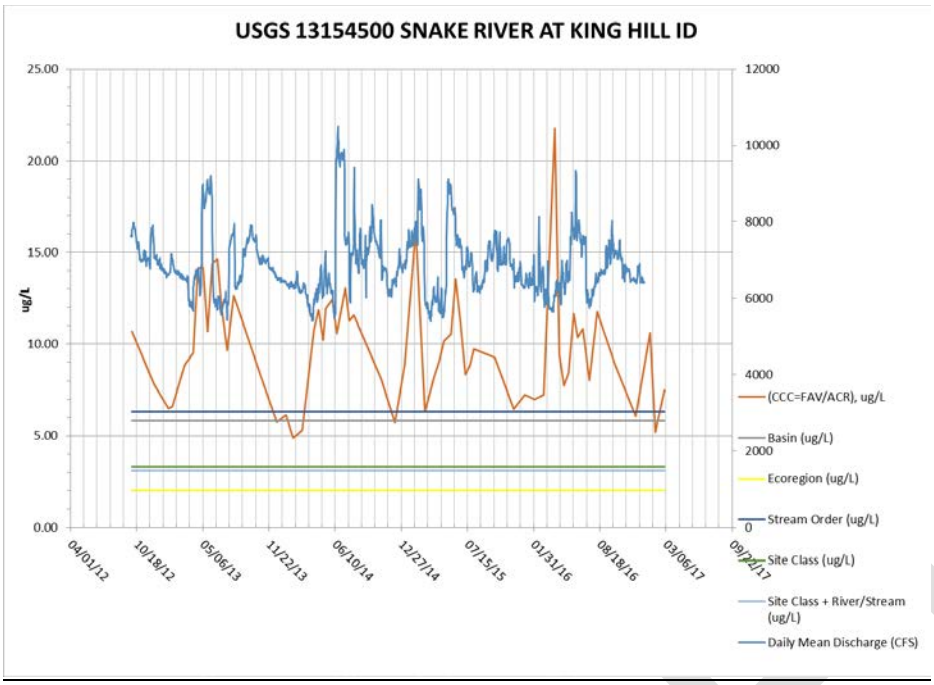

USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID
ug/L
CFS
6.00
5.00
4.00
3.00
2.00
1.00
0.00
4500
4000
3500
3000
2500
2000
1500
1000
500
0
07/24/98
11/01/98
02/09/99
05/20/99
08/28/99
12/06/99
03/15/00
06/23/00
(CCC=FAV/ACR), ug/L
Basin (ug/L)
Ecoregion (ug/L)
Stream Order (ug/L)
Site Class (ug/L)
Site Class + River/Stream (ug/L)
Daily Mean Discharge (CFS)


USGS 12413875 ST JOE RIVER AT RED IVES RANGER STATION, ID
ug/L
CFS
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
400
350
300
250
200
150
100
50
0
10/27/99
11/16/99
12/06/99
12/26/99
01/15/00
02/04/00
02/24/00
(CCC=FAV/ACR), ug/L
Basin (ug/L)
Ecoregion (ug/L)
Stream Order (ug/L)
Site Class + River/Stream (ug/L)
Daily Mean Discharge (CFS)


USGS 12419000 SPOKANE RIVER NR POST FALLS ID
ug/L
CFS
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
24990
19990
14990
9990
4990
-10
02/09/99
03/31/99
05/20/99
07/09/99
08/28/99
10/17/99
12/06/99
01/25/00
03/15/00
05/04/00
(CCC=FAV/ACR), ug/L
Basin (ug/L)
Ecoregion (ug/L)
Stream Order (ug/L)
Site Class (ug/L)
Site Class + River/Stream (ug/L)
Daily Mean Discharge (CFS)


USGS 13056500 HENRYS FORK NR REXBURG ID
ug/L
CFS
12.00
10.00
8.00
6.00
4.00
2.00
0.00
6000
5000
4000
3000
2000
1000
0
11/22/13
06/10/14
12/27/14
07/15/15
01/31/16
08/18/16
03/06/17
09/22/17
(CCC=FAV/ACR), ug/L
Basin (ug/L)
Ecoregion (ug/L)
Stream Order (ug/L)
Site Class (ug/L)
Site Class + River/Stream (ug/L)
Daily Mean Discharge (CFS)


USGS 13092747 ROCK CREEK AB HWY 30/93 XING AT TWIN FALLS ID
ug/L
CFS
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
450
400
350
300
250
200
150
100
50
0
04/01/12
10/18/12
05/06/13
11/22/13
06/10/14
12/27/14
07/15/15
01/31/16
08/18/16
03/06/17
09/22/17
(CCC=FAV/ACR), ug/L
Basin (ug/L)
Ecoregion (ug/L)
Stream Order (ug/L)
Site Class (ug/L)
Site Class + River/Stream (ug/L)
Daily Mean Discharge (CFS)


USGS 13154500 SNAKE RIVER AT KING HILL ID
25.00
20.00
15.00
10.00
5.00
0.00
ug/L
12000
10000
8000
6000
4000
2000
0
04/01/12
10/18/12
05/06/13
11/22/13
06/10/14
12/27/14
07/15/15
01/31/16
08/18/16
03/06/17
09/22/17
(CCC=FAV/ACR), ug/L
Basin (ug/L)
Ecoregion (ug/L)
Stream Order (ug/L)
Site Class (ug/L)
Site Class + River/Stream (ug/L)
Daily Mean Discharge (CFS)

DRAFT