Fact Sheet

The U.S. Environmental Protection Agency (EPA) Proposes to Reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:

US Silver Idaho, Inc.
Coeur and Galena Mines and Mills

Public Comment Start Date: March 5, 2019
Public Comment Expiration Date: April 4, 2019

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The EPA Proposes To Reissue an NPDES Permit
The EPA proposes to reissue the NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions for the facility
- a map and description of the discharge location
- technical material supporting the conditions in the permit

State Certification
Upon the EPA's request, the Idaho Department of Environmental Quality (DEQ) has provided a draft certification of the permit for this facility under CWA § 401. The draft is included in this Fact Sheet as Appendix D. Comments regarding the certification should be directed to:

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, Idaho 83814

Public Comment
Persons wishing to comment on, or request a Public Hearing on the draft permit for this facility may do so in writing by the expiration date of the Public Comment period. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to the EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit can become effective upon issuance. If substantive comments are received, the EPA will address the comments and issue the permit. The permit will become effective no less than 33 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

Documents are Available for Review
The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting the EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the following address:

US EPA Region 10
1200 Sixth Avenue, Suite 155, OWW-191
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The draft permit, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at https://www.epa.gov/npdes-permits/idaho-npdes-permits

The fact sheet and draft permit are also available at:

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, Idaho 83814 (208) 769-1422

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
ACR	Acute-to-Chronic Ratio
AML	Average Monthly Limit
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BLM	Biotic Ligand Model (for copper)
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
BPT	Best Practicable Control Technology
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
DMR	Discharge Monitoring Report
EFH	Essential Fish Habitat
ELG	Effluent Limitation Guideline
EPA	U.S. Environmental Protection Agency
gpd	Gallons per day
HUC	Hydrologic Unit Code
IC	Inhibition Concentration
ICIS	Integrated Compliance Information System
LA	Load Allocation
lbs/day	Pounds per day
LC	Lethal Concentration
LC_{50}	Concentration at which 50% of test organisms die in a specified time period
LOEC	Lowest Observed Effect Concentration
LTA	Long Term Average
mg/L	Milligrams per liter
ml	Milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration

NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SIC	Standard Industrial Classification
SPCC	Spill Prevention and Control and Countermeasure
SS	Suspended Solids
Su	Standard Units
TBEL	Technology-based Effluent Limitation
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
USFWS	US Fish and Wildlife Service
WET	Whole Effluent Toxicity
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limitation
WQS	Water Quality Standards

I. Background Information

A. General Information

This fact sheet provides information on the draft NPDES permit for the following entity:

Table 1. General Facility Information	
NPDES Permit #:	ID0000027
Applicant:	US Silver Idaho, Inc. Coeur and Galena Mines and Mills
Type of Ownership	Private
Physical Address:	Galena Location: Lake Gulch, south of Silverton, Idaho Coeur Location: Shields Gulch, south of Osburn, Idaho
Mailing Address:	PO Box 440 Wallace, Idaho 83873
Facility Contact:	Torin Hasz General Manager Office: (208) 752-1116 Ext. 1004 torinhasz@us-silver.com
Facility Location:	Galena Mill: 47.4803°N, 115.9647° W Coeur Mill: 47.4894°N, 115.9914° W
Receiving Water	001: Lake Creek 002: SF Coeur d'Alene (SFCdA) River
Facility Outfall	001: 47.4861°N, 115.9553°W 002: 47.4978°N, 115.9750°W

B. Permit History

The EPA first issued a National Pollutant Discharge Elimination System (NPDES) permit for this faciltiy to ASARCO on August 31, 1973. A permit was reissued to Silver Valley Resources on December 8, 1989, which expired on January 10, 1994. A timely application for renewal of the permit was submitted to the EPA on April 15, 1993. Revised applications were submitted in 1994 and 2000.

Subsequently, the EPA reissued the NPDES permit for the Coeur and Galena Mines and Mills (facility) on May 24, 2007**;** the permit became effective on July 1, 2007, and expired on June 30, 2012. At that time, the operator of the facility was U.S. Silver Corporation (U.S. Silver or permittee). An NPDES application for permit reissuance was submitted by the permittee on January 3, 2012. The EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been administratively extended and remains fully effective and enforceable.

C. Tribal Consultation

On December 6, 2018, the EPA sent a letter to the Coeur d'Alene Tribe to inform them that a new draft permit is being prepared and to offer the opportunity to request government to government consultation on this permitting action. To date, the EPA has received no offer to consult on the permit.

II. Idaho NPDES Authorization

In 2014, the Idaho Legislature revised the Idaho Code to direct DEQ to seek authorization from the EPA to administer the NPDES permit program for the State of Idaho. On August 31, 2016, DEQ submitted a program application pursuant to CWA § 402(b) and 40 CFR 123.21.

DEQ was authorized to administer the NPDES program, under a phased approach, that began July 1, 2018. Authority to permit industrial facilities will transfer to DEQ on July 1, 2019. At that point in time, all documentation required by the permit will be sent to DEQ rather than to the EPA and any decision under the permit stated to be made by the EPA or jointly between the EPA and DEQ will be made solely by DEQ. Permittees will be notified by DEQ when this transition occurs.

III. Facility Information

US Silver owns and operates the Galena and Coeur Mines and Mills, underground mines and mills that produce copper, silver, and lead concentrates. The facility has historically processed 180,000 to 200,000 tons/year of ore providing approximately 4 million troy ounces of silver, 3 million pounds of copper concentrate, and 7 million pounds of lead. Maximum mill production at Galena and Coeur is approximately 1,230 tons/day and 700 tons/day, respectively. The average mill production rates for Galena and Coeur are 800 tons/day and 110 tons/day, respectively.

A. Galena Mine and Mill

The Galena Mine is approximately three miles from Wallace, Idaho, located in Lake Gulch, Shoshone County, Idaho at Latitude 47° 28' 49"N, Longitude 115° 57' 53" W (see Appendix A). The Galena facility began mining silver, copper and lead around 1955. It was placed on standby status in July 1992 (due to low metal prices) and began production again in 1997.

Galena is an underground silver mine which utilizes a horizontal cut and fill method (a.k.a. stoping) of mining before transporting the ore-bearing rock to the surface. From the surface, the ore-bearing rock is trucked 650 feet to the floatation mill. At the mill, the rock enters the primary jaw crushing circuit, where it is crushed to less than three-inch size pieces of ore. The secondary crusher reduces the ore size to under ⅞th inch and then stores it in a fine ore bin. A conveyor belt feeds the ore from the bin into a large cylindrical rotating ball mill in which three- and four-inch steel balls tumble and pulverize the ore to a fine sand. Water is added to the crushed ore to form a slurry during grinding. The mill make-up water comes from the Failer water well, Lake and Tin Cup Creeks and the Galena Mine. The slurry is then pumped to the flotation circuit to extract the sulfide minerals from the waste rock. The flotation circuit consists of a series of tanks containing motorized agitators where reagents [including methyl isobutyl carbinol, hydrated lime, and sodium cyanide] are added to facilitate extraction of the mineral concentrate. The concentrate is then skimmed from the tops of the tanks and deposited into a 20-foot diameter thickener tank where the minerals settle to the bottom. The thickened concentrate is pumped to a drum filter to form a dewatered silver-copper concentrate cake that is loaded in an enclosed concentrate loading facility at the mill and transported off-site for refining.

Most of the tailings (the residual waste rock from flotation) are processed in cyclone classifiers to remove the fine fraction. The coarser tailings are pumped back down into the mines to be used as backfill. The finer tailings (approximately 350 - 470 gpm) are pumped to the Osburn tailings impoundment where treatment is by sedimination (i.e., settling) and polishing.

During mine development, waste rock (non-ore-bearing rock removed from the mine in order to gain access to the ore) is transported approximately 1500 feet to a waste dump.

The Galena mine and mill has septic tanks that discharge to the Lake Creek settling ponds. The Calahan adit discharge (approximately 10 gpm) is diverted to the Lake Creek settling ponds

Outfall 001 discharges wastewater from the Lake Creek settling ponds through a v-notch weir to Lake Creek (a tributary of the SFCdA River). The wastewater includes:

- sanitary wastewater,
- excess water pumped from the Galena mine (mine drainage) and Calahan adit,
- surface water associated with project disturbance (including development rock areas, roads, mine parking area, shaft and general mine laydown areas for the Galena mill), and
- water used for domestic and fire water purposes.

The Galena mill deposits mine tailings to the Osburn tailings pond. The impoundment encompasses approximately 60 acres and is designed to store approximately five million tons of tailings. The tailings impoundment includes two storage areas followed by two decant (i.e., settling) ponds after which the effluent is polished with a charcoal/carbon filter prior to discharge through outfall 002 to the SFCdA River.

B. Coeur Mine and Mill

The Coeur Mine adjoins the western boundary of the Galena Mine and began production of silver in 1976. The mine was placed on standby status in April 1991 (due to low silver prices), reactivated in June 1996, and placed on standby again in 1998. Currently, the Coeur mill is operating at a low production rate depending on market conditions, ore grade, and other considerations. The mill is located in Shields Gulch, Shoshone County, Idaho at Latitude 47° 29' 22"N, Longitude 115° 59' 29" W (see Appendix A). The mine is approximately two miles from the town of Osburn, Idaho and four miles from Wallace.

The Coeur mine is also an underground silver mine. When the mine is operating, the ore-bearing rock is transported to the surface and conveyed 680 feet to the floatation mill. The Coeur mill has a similar milling circuit as the Galena mill and the concentrate is also loaded into trucks at a contained loading facility at the mill and transported off-site for refining. The make-up water for the Coeur mill comes from Shields Creek, Avista (formerly Washington Water Power) substation well, and the Coeur Mine.

The waste rock from Coeur mine development is transported by front-end loader approximately 250 feet to the waste dump. Seepage and runoff from the waste dump is routed to the Osburn tailings ponds.

Coeur’s mine tailings (approximately 112 gpm during production) and mine drainage are also deposited in the Osburn tailings ponds (about 0.75 miles northeast of the mine). The

sanitary wastes at the Coeur mine and mill are collected in septic tanks and digested and discharged to the Osburn tailings ponds. Mine drainage from the Rainbow adit (approximately 5 gpm) is collected and routed to the Osburn tailings ponds.The Osburn tailings ponds discharge through outfall 002 to the SFCdA River.

Table 2: NPDES Outfalls

Outfall	Receiving Water	Description of Wastewater Source	Flow Rate[1]
001	Lake Creek	Galena mine drainage, runoff from the waste rock dump, Calahan mine drainage, and sanitary wastewater	avg. discharge = 1.8 cfs 99th percentile = 4.6 cfs = 2.97 mgd max. discharge = 5.0 cfs = 3.2 mgd
002	SFCdA River	Galena and Coeur tailings, sanitary waste, Rainbow mine drainage, and seepage and runoff from the Coeur waste rock dump	avg. discharge = 0.31 cfs 99th percentile = 1.9 cfs = 1.2 mgd max discharge = 9.7 cfs = 6.3 mgd

Footnote:
1 Outfall 001 and 002 flows are based on

Effluent Characterization

To characterize the effluent, the EPA evaluated the facility's application form, discharge monitoring report (DMR) data, and additional data provided by the Permittee. The effluent quality is summarized in Table 3. Data are provided in Appendix B.

Table 3: Effluent Characterization

Parameter ug/L unless noted	Outfall 001		Outfall 002	
	Maximum	Minimum	Maximum	Minimum
Copper	18	0.158	260	1.27
Lead	218	0.03	237	25.7
Zinc	65	0.0025	221	9.5
Cadmium	4.2	0.0001	1.2	0.05
Mercury	0.0069	ND*	0.0001	ND*
Arsenic	7.0	4.0	7	5.5
Antimony	30.0	29.0	30	29
Silver	0.3	0.1	0.3	0.1
Manganese	759	698	759	698
pH, standard units (su)	8.8	6.6	8.9	6.3
Temperature	27.6	1.8	27.1	0.7
TSS, mg/L	22	ND*	39	ND*
E. coli, #/100 mL	920	4	350	ND*
Whole Effluent Toxicity, TUc	1	ND*	6.02	ND*
Hardness, mg/L	227	34	234	72.2
Chromium VI	14	ND*	---	---

* ND = Non-detect
Source: Data provided by US Silver April 2013 through September 2016

Compliance History

A summary of numeric effluent violations over the last 5 years is provided in Table 4. The facility also submitted late DMRs several times but most of those were for months where no discharge occurred and the DMRs were subsequently submitted to EPA.

Additional compliance information for this facility, including compliance with other environmental statutes, is available on Enforcement and Compliance History Online (ECHO). The ECHO web address for this facility is:

https://echo.epa.gov/detailed-facility-report?fid=ID0000027&sys=ICP

Table 4: Summary of Numeric Effluent Violations*		
Outfall 001		
Cadmium	lb/d	1
Cadmium	ug/L	1
Copper	lb/d	2
Copper	ug/L	2
Lead	lb/d	2
Lead	ug/L	5
Mercury	ug/L	6
Outfall 002		
Cadmium	lb/d	1
Copper	ug/L	4
Lead	ug/L	3
Total Suspended Solids	mg/L	1
*All violations are of Maximum Daily Limitations		

The EPA conducted an inspection of the facility in May 2017. It encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. Several areas of concern were noted including the effluent violations cited above, a broken coupling that caused a discharge to Lake Creek but was quickly repaired, and some violation reporting concerns.

IV. Receiving Water

In drafting permit conditions, the EPA must analyze the effect of the facility's discharge on the receiving water. The details of that analysis are provided later in this Fact Sheet. This section summarizes characteristics of the receiving water that impact that analysis.

A. Receiving Water

This facility has two discharge points, Outfall 001 and Outfall 002. Outfall 001 discharges to Lake Creek near Silverton, Idaho. Outfall 002 discharges to the SFCdA River near Osburn, Idaho.

B. Surface Water Use Designations (*IDAPA 58.01.02.100)*

Waterbodies are designated in Idaho to protect water quality for existing or designated uses. The designated use of a waterbody does not imply any rights to access or ability to conduct any activity related to the use designation, nor does it imply that an activity is safe. The designated beneficial uses for Lake Creek and SFCdA River are found in IDAPA 58.01.02.110.09.

For Lake Creek:

AQUATIC LIFE.
Cold water (**COLD**): water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species.

Salmonid spawning (**SS**): waters which provide or could provide a habitat for active self-propagating populations of salmonid fishes.

RECREATION.
Secondary contact recreation (**SCR**): water quality appropriate for recreational uses on or about the water and which are not included in the primary contact category. These activities may include fishing, boating, wading, infrequent swimming, and other activities where ingestion of raw water is not likely to occur.

For SFCdA River:

The designated beneficial uses below Canyon Creek (See Figure A-1) are COLD and SCR.

The Water Quality Standards further state that all waters of the State of Idaho are protected for industrial and agricultural water supply, wildlife habitats and aesthetics (IDAPA 58.01.02.100.03.b and c, 100.04 and 100.05). In addition, to the designated uses, salmonid spawning is an existing use in the SFCdA River as documented by DEQ's Beneficial Use Reconnaissance Monitoring in 2014 and in DEQ's Summary of U.S. Silver Bioassessment Salmonids Data (2007-2018).

Water Quality

The water quality for the receiving water is summarized in Table 5.

Table 5: Receiving Water Quality Data

Parameter ug/L unless noted	# Above Detection[1]		Percentile	Values[2]	
	001	002		Lake Creek	SFCdA River
Cadmium	3	16	95th	0.32	5.7
Copper	4	4	95th	1.8	1.4
Lead	6	10	95th	5.3	6.6
Mercury	0	0	95th	0[3]	0[3]
Zinc	18	20	95th	15.7	852.2
Temperature, °C	20	20	Min/Max	2.5/15.0	0.7/27.1
pH, su	20	20	Min/Max	6.2/8.1	6.3/8.9
Hardness, mg/L	20	20	5th/95th	22.6/141.0	24.3/126.0

1 - out of 20 total samples
2 - Values were determine using ½ the detection level when reported as less than that value
3 – When all values are below an adequate detection level, zero is used as the background value
Source: Data collected by permittee 2012-2016

C. Water Quality Limited Waters

The State of Idaho's 2014 Integrated Report (Section 303(d) Category 5) lists Lake Creek, from the mine impact area to its confluence with the SFCdA River, as impaired but the pollutant or pollutants causing the impairment is listed as unknown. The SFCdA River

between Canyon and Pine creeks is listed as impaired by cadmium, lead, zinc (Category 5) and Sedimentation/Siltation (Category 4a).

A Sedimentation/Siltation TMDL was developed by DEQ and approved by the EPA on August 21, 2003. The TMDL contains a TSS concentration limit (20 mg/L) as well as an allowable tons/year loading limit. The Wasteload Allocation (WLA) for Outfall 001 is 36.9 tons/year and for Outfall 002, it is 14.6 tons/year.

When a TMDL is not available for an impaired waterbody, as is the case for cadmium, lead and zinc, the EPA develops effluent limitations based on meeting the state's water quality criteria prior to discharge to the water (i.e., end-of-pipe). DEQ adopted site specific criteria (SSC) for cadmium, lead and zinc for the SFCdA River and the EPA approved them on February 28, 2003. They are the applicable criteria for the SFCdA River and Lake Creek.

D. Low Flow Conditions

Critical low flows for the receiving water are summarized in Table 6. The previous permit required the facility to monitor flow upstream of both outfalls. Even though stream flows were not measured every day, these flows were used to determine the critical low flows. The minimum non-zero flow was used as the 1Q10 and the lowest running 7 day average (any average affected by a non-measurement was not used) as the 7Q10. The flow percentages for the tier levels is calculated from the same data set.

Table 6: Critical Flows in Receiving Water

Flows (cfs)	Lake Creek	SFCdA River
Minimum (1Q10)	0.15	59
Minimum$_7$ (7Q10)	0.15	60.4
30Q5*	0.41	61.0
Harmonic Mean	1.1	101.0
10th percentile	0.51	63.0
50th percentile	1.9	87.0
70th percentile	6.0	135.0
90th percentile	21.3	1135.0

1. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years.
2. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.
3. The 30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.
4. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.

Source: Data submitted by the permittee for July 1, 2007 through September 30, 2017
* Data from October 2012 through September 2017 used for 30Q5 calculation.

The flows for Lake Creek in the previous permit were calculated based on a relationship between the values at Silverton used for the SFCdA flows at Outfall 002 because there are no USGS stations on Lake Creek. The previous flows were higher than the flows measured by US Silver over the last 10 years. This will result in less dilution being available when establishing wasteload allocations for use in the reasonable potential and effluent limitation calculations.

Lake Creek	Mine	Previous
1Q10	0.15	0.95
7Q10	0.15	1.1
All flows in cfs		
Previous flows determined by multiplying the SFCdA flow from the next Table by 0.0352		

The previous permit used flows for the SFCdA River lower than the current data set indicates. Below is a table showing the flows at various locations upstream and downstream of Outfall 002:

SFCdA	USGS @ Wallace (8 years)	Mine	Previous	USGS @ Pinehurst
1Q10	19	59	27	71.8
7Q10	29.4	60.4	31	73.1
All flows in cfs				

This will result in more dilution being available when establishing wasteload allocations for use in the reasonable potential and effluent limitation calculations.

V. Effluent Limitations and Monitoring

Tables 7 and 8, below, present the current effluent limitations and monitoring requirements from the 2007 Permit.

Table 7 – Current Effluent Limitations and Monitoring Requirements for Outfall 001

Parameter	Upstream River Flow Tier	Effluent Limitations				Monitoring Requirements	
		Maximum Daily		Average Monthly		Sample Frequency	Sample Type
		ug/l	lb/day	ug/l	lb/day		
cadmium	Not dependent on river flow	1.9	0.027	0.87	0.012	weekly	24-hour composite
lead		58	0.81	27	0.38		
zinc		195	2.7	87	1.2		
copper	< 1.7 cfs (tier 1)	21	0.29	7.7	0.11	weekly	24-hour composite
	≥ 1.7 to < 3.8 cfs (tier 2)	15	0.21	5.7	0.079		
	≥ 3.8 to < 13.4 cfs (tier 3)	10	0.14	3.8	0.053		
	≥ 13.4 to < 23 cfs (tier 4)	12	0.17	4.4	0.061		
	≥ 23 cfs (tier 5)	23	0.32	8.2	0.11		

Table 7 – Current Effluent Limitations and Monitoring Requirements for Outfall 001							
Parameter	Upstream River Flow Tier	Effluent Limitations				Monitoring Requirements	
		Maximum Daily		Average Monthly		Sample Frequency	Sample Type
		ug/l	lb/day	ug/l	lb/day		
mercury	< 1.7 cfs (tier 1)	0.022	0.00030	0.011	0.00015	2/month	grab
	≥ 1.7 to < 3.8 cfs (tier 2)	0.023	0.00032	0.012	0.00017		
	≥ 3.8 to < 13.4 cfs (tier 3)	0.027	0.00037	0.014	0.00019		
	≥ 13.4 to < 23 cfs (tier 4)	0.071	0.00098	0.035	0.00048		
	≥ 23 cfs (tier 5)	0.11	0.0015	0.054	0.00075		
total suspended solids (TSS)	Not dependent on river flow	30 mg/l	560	20 mg/l	202	weekly	24-hour composite
pH	Not dependent on river flow	see Permit Part I.A.3.				weekly	grab
Chromium VI	--	report in ug/l		--		quarterly	24-hour composite
E.coli	--	report in #/100 ml		--		monthly	grab
outfall flow	--	report in cfs		report in cfs		daily	measured
hardness, as $CaCO_3$	--	--		report in mg/l		monthly	grab
temperature	--	report in °C		--		weekly	grab
whole effluent toxicity(WET)	--	report in TU_C		--		quarterly	24-hour composite
Lake Creek upstream of outfall 001	--	--		report in cfs		daily	recording

Table 8 – Current Effluent Limitations and Monitoring Requirements for Outfall 002							
Parameter	Upstream River Flow Tier	Effluent Limitations				Monitoring Requirements	
		Maximum Daily		Average Monthly		Sample Frequency	Sample Type
		ug/l	lb/day	ug/l	lb/day		
cadmium	Not dependent on river flow	2.6	0.019	0.91	0.007	weekly	24-hour composite
lead		88	0.66	32	0.24		
zinc		237	1.8	85	0.63		
copper	< 48 cfs (tier 1)	120	0.9	56	0.42	weekly	24-hour composite
	≥ 48 to < 109 cfs (tier 2)	130	0.97	64	0.48		

Table 8 – Current Effluent Limitations and Monitoring Requirements for Outfall 002							
Parameter	Upstream River Flow Tier	Effluent Limitations				Monitoring Requirements	
		Maximum Daily		Average Monthly		Sample Frequency	Sample Type
		ug/l	lb/day	ug/l	lb/day		
	≥ 109 to < 379 cfs (tier 3)	230	1.7	110[6]	0.82[6]		
	≥ 379 to < 649 cfs (tier 4)	300	1.7	150	1.1		
	≥ 649 cfs (tier 5)	300	2.2	150	1.1		
mercury	< 48 cfs (tier 1)	0.24	0.0018	0.12	0.00090	2/month	grab
	≥ 48 to < 109 cfs (tier 2)	0.35	0.0026	0.18	0.0013		
	≥ 109 to < 379 cfs (tier 3)	0.41	0.0031	0.20	0.0015		
	≥ 379 to < 649 cfs (tier 4)	1.4	0.011	0.68	0.0051		
	≥ 649 cfs (tier 5)	2.0	0.014	1.0	0.0075		
total suspended solids (TSS)	Not dependent on river flow	30 mg/l	248	20 mg/l	80	weekly	24-hour composite
pH	Not dependent on river flow	see Permit Part I.A.3.				weekly	grab
E.coli	--	report in #/100 ml		--		monthly	grab
outfall flow	--	report in cfs		report in cfs		daily	measured
hardness, as $CaCO_3$	--	--		report in mg/l		monthly	grab
temperature	--	report in °C		--		weekly	grab
whole effluent toxicity(WET)	--	report in TU_C		--		quarterly	24-hour composite
Lake Creek upstream of outfall 001*	--	--		report in cfs		daily	Recording

* This was a typographical error in the previous permit and the actual requirement was to measure flow upstream of Outfall 002 in the SFCdA River.

Draft Permit - Effluent Limitations and Monitoring Requirements

Tables 9 and 10, below, contain the proposed effluent limitations and monitoring requirements for Outfalls 001 and 002, respectively.

Table 9 – Proposed Effluent Limitations and Monitoring Requirements for Outfall 001

Parameter		Upstream River Flow Tier	Effluent Limitations				Monitoring Requirements	
			Maximum Daily		Average Monthly		Sample Frequency	Sample Type
			ug/l	lb/day	ug/l	lb/day		
Cadmium		--	1.6	0.027	0.87	0.012	Weekly	24-hour composite
Lead			58.0	0.81	24.1	0.39		
Zinc			195	2.7	87	1.2		
Copper								
TIERS	1	< 0.51 cfs	20.6	0.51	7.2	0.18	Weekly	24-hour composite
	2	≥ 0.51 to < 1.9 cfs	20.6	0.51	7.3	0.18		
	3	≥ 1.9 to < 6.0 cfs	19.9	.49	7.0	0.17		
	4	≥ 6.0 to < 21.3 cfs	20.3	.51	7.1	0.8		
	5	≥ 21.3 cfs	11.3	.28	4.0	0.1		
Copper (BLM)		--	1.0	0.025	0.4	0.009	Weekly	24-hour composite
The copper effluent limitation will be based on the criteria that are in effect at the time the permit is issued.								
Mercury								
TIERS	1	< 0.51 cfs	0.020	0.0005	0.010	0.0003	2/month	Grab
	2	≥ 0.51 to < 1.9 cfs	0.020	0.0005	0.010	0.0003		
	3	≥ 1.9 to < 6.0 cfs	0.022	0.0005	0.011	0.0003		
	4	≥ 6.0 to < 21.3 cfs	0.026	0.0007	0.013	0.0003	2/month	Grab
	5	≥ 21.3 cfs	0.043	0.0011	0.021	0.0005		
Total Suspended Solids (TSS)		--	30 mg/L	--	20 mg/L	--	Weekly	24-hour composite
TSS, loading		--	Annual Average not to exceed 202 lbs/day				Annual	Calculation
pH		--	6.5 – 9.0 standard units (su)				Weekly	Grab
Arsenic								
Tier	1	< 0.51 cfs	13.2	0.33	6.6	0.16	Monthly	24-hour composite

Table 9 – Proposed Effluent Limitations and Monitoring Requirements for Outfall 001								
Parameter		Upstream River Flow Tier	Effluent Limitations				Monitoring Requirements	
			Maximum Daily		Average Monthly		Sample Frequency	Sample Type
			ug/l	lb/day	ug/l	lb/day		
Arsenic		≥ 0.51 to < 1.9 cfs	13.2	0.33	6.6	0.16	Monthly	24-hour composite
Tier	2							
E.coli, #/100 ml		--	576.0		126.0		Monthly	Grab
Outfall Flow		--	report in cfs		report in cfs		Daily	Measured
Hardness, as $CaCO_3$		--	--		report in mg/l		Monthly	Grab
Temperature		--	report in °C		--		Weekly	Grab
whole effluent toxicity(WET)		--	report in TU_C		--		Quarterly	24-hour composite
Lake Creek upstream of outfall 001		--	--		report in cfs		Daily	Recording

Table 10 - Proposed Effluent Limitations and Monitoring Requirements for Outfall 002								
Parameter		Upstream River Flow Tier[1]	Effluent Limitations				Monitoring Requirements	
			Maximum Daily		Average Monthly		Sample Frequency	Sample Type
			ug/l	lb/day	ug/l	lb/day		
Cadmium		--	1.3	0.013	0.8	0.007	Weekly	24-hour composite
Lead			40.0	0.406	16.0	0.163		
Zinc			163.5	1.66	85	0.63		
Copper								
TIERS	1	< 63 cfs	112.8	1.14	42.0	0.43	Weekly	24-hour composite
	2	≥ 63 to < 87 cfs	119.5	1.21	44.5	0.45		
	3	≥ 87 to < 135 cfs	157.9	1.60	58.7	0.60	Weekly	24-hour composite
	4	≥ 135 to < 1135 cfs	232.3	2.36	86.4	0.88		
	5	≥ 1135 cfs	300	3.04	150	1.52		
Copper (BLM)		---	1.0	0.009	0.4	0.025	Weekly	24-hour composite
The copper effluent limitation will be based on the criteria that are in effect at the time the permit is issued.								
Mercury								
TIERS	1	< 63 cfs	0.178	0.0018	0.089	0.0009	2/month	Grab
	2	≥ 63 to < 87 cfs	0.185	0.0019	0.092	0.0009		

Table 10 - Proposed Effluent Limitations and Monitoring Requirements for Outfall 002								
Parameter		Upstream River Flow Tier[1]	Effluent Limitations				Monitoring Requirements	
			Maximum Daily		Average Monthly		Sample Frequency	Sample Type
			ug/l	lb/day	ug/l	lb/day		
Mercury TIERS	3	≥ 87 to < 135 cfs	0.248	0.0025	0.123	0.0013		
	4	≥ 135 to < 1135 cfs	0.373	0.0038	0.186	0.0019		
	5	≥ 1135 cfs	2.0	0.0203	1.0	0.0101		
Total Suspended Solids (TSS)		--	30 mg/L	--	20 mg/L	--	Weekly	24-hour composite
TSS, loading		--	Annual Average not to exceed 80 lbs/day				Annual	Calculation
pH		--	6.5 – 9.0 su				Weekly	Grab
E.coli, #/100 ml		--	576.0		126.0		Monthly	Grab
Outfall Flow		--	report in cfs		report in cfs		Daily	Measured
Hardness, as $CaCO_3$		--	--		report in mg/l		Monthly	Grab
Temperature		--	report in °C		--		Weekly	Grab
Whole Effluent Toxicity(WET)		--	report in TU_C		--		Quarterly	24-hour composite
SFCdA River upstream of Outfall 002		--	--		report in cfs		Daily	Recording

Outfall 001 permit limit changes:

The average monthly concentration effluent limitations for the first 3 tiers of copper increased. The maximum daily concentration effluent limitations for the first 3 tiers of copper and the fifth tier of mercury increased. The rest of the concentration effluent limitations either decreased or remained the same. There is an increase in all loading limitations except for the last 2 tiers of mercury which either decreased or remained the same. The proposed effluent limitation based on the copper BLM is new and is dependent on whether the criteria is approved by the EPA prior to permit issuance. If the new copper criteria is approved by the EPA prior to permit issuance, then the tiered copper effluent limits will be replaced with the copper (BLM) effluent limitation. The effluent limitation for arsenic is also new. The TSS limitation is similar to the previous permit but is an annual average rather than a monthly average.

Outfall 002 permit limit changes:

The concentration effluent limitations either decreased or remained the same. There is some increase in loading limitations except for cadmium,lead, zinc, the third tier of copper and the second tier of mercury which either decreased or remained the same. The proposed effluent limitation based on the copper BLM is new and, as above, is dependent on its approval status at the time of permit issuance. The TSS limitation is similar to the previous permit but is an annual average rather than a monthly average.

A. Basis for Effluent Limitations

In general, the CWA requires that the effluent limitations for a particular pollutant be the more stringent of either technology-based effluent limitations (TBELs) or water quality-based effluent limitations (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than TBELs.

B. Pollutants of Concern

Pollutants of concern are those that either have TBELs or may need WQBELs. The EPA identifies pollutants of concern for the discharge based on those which:

- Have a technology-based limitation
- Have an assigned wasteload allocation (WLA) from a TMDL
- Had an effluent limitation in the previous permit
- Are present in the effluent monitoring. Monitoring data are reported in the application and DMR and any special studies
- Are expected to be in the discharge based on the nature of the discharge

In determining the Pollutants of Concern, the EPA reviewed the requirements of the previous permit and the permit application. Based on this analysis, pollutants of concern are as follows:

- Cadmium
- Lead
- Zinc
- Copper
- Mercury
- Total Suspended Solids (TSS)
- pH
- Chromium VI
- *E. coli*
- Temperature
- Whole effluent toxicity (WET)

C. Technology-Based Effluent Limitations (TBELs)

On December 3, 1982, the EPA published Effluent Limitation Guidelines (ELGs) for the mining industry (found in 40 CFR Part 440). Within these guidelines, Subpart J, titled Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory, applies to the Coeur and Galena Mine and Mill discharges. The BPT (40 CFR 440.102) and BAT (40 CFR 440.103) ELGs within this subcategory have been considered. They are set forth in Table 11 below. The EPA compared the BPT and BAT ELGs with the potential water quality based effluent limits and has applied the more stringent limit in the permit.

TABLE 11: TBELsfor the Coeur Galena Mines and Mills				
Parameter ug/L unless noted	**Effluent Limitations for Mine Drainage (outfall 001)**		**Effluent Limitations for Mill Process Waters (outfall 002)**	
	daily maximum	monthly average	daily maximum	monthly average
Cadmium	100	50	100	50
Copper	300	150	300	150
Lead	600	300	600	300
Mercury	2	1	2	1
Zinc	1,500	750	1,000	500
TSS, mg/l	30	20	30	20
pH, su	within the range 6.0 -9.0		within the range 6.0 - 9.0	

D. Water Quality-Based Effluent Limitations (WQBELs)

Statutory and Regulatory Basis

CWA § 301(b)(1)(C) requires the development of limitations in permits necessary to meet water quality standards. Discharges to State waters must also comply with limitations imposed by the State as part of its certification of NPDES permits under CWA § 401. 40 CFR 122.44(d)(1), implementing CWA § 301(b)(1)(C), requires that permits include limitations for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including narrative criteria for water quality.

The regulations require the permitting authority to make this evaluation using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limitations must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation for the discharge in an approved TMDL. If there are no approved TMDLs that specify wasteload allocations for this discharge, WQBELs are calculated directly from the applicable water quality standards.

Reasonable Potential Analysis and Need for WQBELs

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (*TSD*) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit.

In some cases, a dilution allowance or mixing zone is permitted. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and within which certain water quality criteria may be exceeded (EPA, 2014). While the criteria may

be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired, all designated uses are maintained and acutely toxic conditions are prevented.

The Idaho Water Quality Standards at IDAPA 58.01.02.060 provides Idaho's mixing zone policy for point source discharges. In the draft CWA § 401 Certification (Appendix D), DEQ proposes to authorize mixing zones for copper, mercury and arsenic. The proposed mixing zones are summarized in Table 12. The EPA also calculated dilution factors for critical flow conditions. All dilution factors are calculated with the effluent flow rate set 4.59 cfs for Outfall 001 and 1.88 cfs for Outfall 002**.**

Table 12. Mixing zones

Criteria Type	Critical Low Flow (cfs)	Mixing Zone (% of Critical Low Flow)	Dilution Factor
Outfall 001			
Acute Aquatic Life, 1Q10	0.15	25	1.008
Chronic Aquatic Life, 7Q10	0.15	25	1.008
Human Health Carcinogen, Harmonic Mean	1.1	25	1.022
Human Health Non-carcinogen, 30Q5	0.41	25	1.060
10th percentile	0.51	25	1.028
50th percentile	1.9	25	1.104
70th percentile	5.99	25	1.326
90th percentile	21.3	25	2.160
Outfall 002			
Acute Aquatic Life, 1Q10	59.0	25	8.84
Chronic Aquatic Life, 7Q10	60.4	25	9.03
Human Health Carcinogen, Harmonic Mean	101.0	25	14.42
Human Health Non-carcinogen, 30Q5	61.0	25	9.11
10th percentile	63.00	25	9.37
50th percentile	87.00	25	12.56
70th percentile	135.00	25	18.94
90th percentile	1135.00	25	151.81

The reasonable potential analysis and WQBEL calculations were based on mixing zones shown in Table 12. If DEQ revises the allowable mixing zone in its final certification of this permit, the reasonable potential analysis and WQBEL calculations will be revised accordingly.

Reasonable Potential and WQBELs

The reasonable potential and WQBEL for specific parameters are summarized below. The calculations are provided in Appendix C.

The reasonable potential for those parameters included in an ELG are calculated based on a discharge at the level of the ELG. Since these values are much less stringent than the WQS, there is always reasonable potential for these parameters. Based on this, the EPA assumes there is reasonable potential for cadmium, lead, zinc, copper, mercury, pH and TSS.

The calculations shown in Appendix C show that the maximum expected concentrations (MEC) at the end-of-pipe for silver, antimony and manganese do not exceed the most stringent applicable criteria. Therefore, there is no reasonable potential for these parameters to cause or contribute to a violation of the WQS so no effluent limitations or monitoring are proposed in the draft permit.

pH

The Idaho water quality standards at IDAPA 58.01.02.250.01.a, require pH values to be within the range of 6.5 to 9.0. Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. Effluent pH data were compared to the water quality criteria. The pH for Outfall 001 ranged from 6.62 su to 8.8 su. The pH for Outfall 002 ranged from 6.25 su to 8.91 su.

E. coli

The Idaho water quality standards state that waters of the State of Idaho, that are designated for recreation, are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100 ml (#/100mL) based on a minimum of five samples taken every three to seven days over a thirty-day period. A mixing zone is not appropriate for bacteria for waters designated for contact recreation.

The Idaho water quality standards also state that a water sample that exceeds certain “single sample maximum” values indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of water quality standards. For waters designated for secondary contact recreation, the “single sample maximum” value is 576 #/100mL (IDAPA 58.01.02.251.01.b.ii.).

The range of *E. coli* measurements for Outfall 001 are from 4 to 920 #/100mL. The range of *E. coli* measurements for Outfall 002 are from below detection to 350 #/100mL.

Since these maximum values (and the calculated MECs) exceed the most stringent criterion, the draft permit proposes a monthly geometric mean effluent limitation for *E. coli* of 126 #/100mL (IDAPA 58.01.02.251.01.a.).

The goal of a WQBEL is to ensure a low probability that water quality standards will be exceeded in the receiving water as a result of a discharge, while considering the variability of the pollutant in the effluent. Because a single sample value exceeding 576 #/100mL indicates a likely exceedance of the geometric mean criterion, the EPA has imposed an instantaneous (single grab sample) maximum effluent limitation for *E. coli* of 576 #/100mL, in addition to a monthly geometric mean limitation of 126 #/100mL, which directly implements the water quality criterion for *E. coli*. This will ensure that the discharge will have a low probability of exceeding water quality standards for *E. coli*.

Arsenic

The Idaho WQS at IDAPA 58.01.02.210 establish arsenic criteria for the protection of human health of 10 µg/L for both consumption of water and fish and water only. These criteria were approved by the EPA in 2010 (hereinafter referred to as the 2010 arsenic criteria).

On June 7, 2016, the EPA entered into a Consent Decree (CD) with Northwest Environmental Advocates (NWEA) addressing the EPA’s approval of the 2010 arsenic

criteria (2016 NWEA CD). The 2016 NWEA CD remands the EPA's 2010 approval of the 2010 arsenic criteria. It required the EPA to take a new action to approve or disapprove the 2010 arsenic criteria by September 15, 2016. The EPA disapproved the 2010 arsenic criteria prior to September 15, 2016.

In conjunction with the 2016 NWEA CD, the EPA also entered into a Settlement Agreement with NWEA (NWEA SA). In the NWEA SA, the EPA agreed that if the EPA disapproved the 2010 arsenic criteria and until new arsenic water quality criteria are in place for CWA purposes, the EPA will use Idaho's 1994 arsenic criteria when interpreting the narrative toxics criteria. These criteria are 6.2 µg/L to protect consumption of organisms only and 0.02 µg/L to protect consumption of water and organisms.

Since neither Lake Creek nor SFCdA River are designated as domestic water supplies, nor is that an existing use, when analyzing reasonable potential using the 1994 criteria, EPA considers 6.2 µg/L to be protective of human health. Using the 1994 arsenic criterion, the facility has reasonable potential to exceed the criterion.

Arsenic is considered a carcinogen and the harmonic mean flow is used when a mixing zone is authorized. At Outfall 001, the MEC for arsenic has reasonable potential to exceed the most strigent criterion at the edge of the mixing zone at 25% of the harmonic mean but not above it. An effluent limitation for arsenic is proposed in the draft permit for all tier levels at and below the tier level that includes the harmonic mean flow. Outfall 002 does not have reasonable potential to exceed the arsenic criterion so no effluent limitation is proposed in the draft permit but continued monitoring is included.

<u>Copper</u>

Current Criteria

The current dissolved copper criteria are hardness based and listed in IDAPA 58.01.02.210.02(a) and (b):

Acute criterion = $0.960*e^{(0.9422*\ln(H)-1.464)}$

Chronic criterion = $0.960*e^{(0.8545*\ln(H)-1.465)}$

The effluent limitations for copper have changed from the previous permit because new data collected during the permit cycle have a different coefficient of variation than the previous data set and different flows were used for the flow tiered effluent limitations. The previous permit used the effluent hardness to calculate water quality criteria. To be consistent with the Idaho Water Quality Standards (IDAPA 58.01.02.210.03.c.ii) the receiving water hardness is used to calculate water quality criteria (see Hardness discussion in Appendix C).

DEQ adopted Copper BLM criteria

The toxicity of metals to aquatic life is highly variable and depends on physical and chemical factors within a waterbody. Hardness has long been acknowledged as one such factor and is reflected in the DEQ's current hardness-dependent criteria, whereby the acute and chronic criteria are determined based on the total hardness of the receiving waterbody.

Hardness-dependent copper criteria do not take into account the effects of other physicochemical properties that affect toxicity, leading to hardness-dependent copper

criteria being either overprotective or under protective of aquatic life. The biotic ligand model (BLM) based criteria outlined in the EPA's revised national recommended freshwater aquatic life criterion for copper takes into consideration copper toxicity influenced by a wide variety of water characteristics DEQ has updated the copper criteria for aquatic life to the EPA-recommended 304(a) criteria and has adopted the BLM criteria. The EPA received the criteria for review on January 28, 2019. It is expected that the EPA's action could occur prior to the issuance of the final permit so both the hardness-dependent and BLM criteria have been used to develop effluent limitations for the draft permit. The criteria that are in effect for CWA purposes at the time of permit issuance will be used to determine the final effluent limitations.

The hardness-dependent criteria only account for competitive binding at biotic ligand sites (e.g., the gill surfaces of a fish) by calcium and magnesium cations (i.e., hardness). The BLM also accounts for binding by other cations, as well as metal speciation and complexation with dissolved organic carbon (DOC) and other inorganic ligands. The BLM incorporates copper speciation and complexation in addition to competitive binding at biotic ligand sites by cations so it better predicts the toxic effects of exposure to dissolved copper in the aquatic environment than the hardness-dependent criteria equations. The BLM produces more accurate predictions of toxic effects from copper in a variety of natural waters. While the BLM does provide more accurate and precise predictions of toxic effects from a given copper concentration, it is important to note that the BLM does not always provide more stringent criteria.

The "*Implementation Guidance for the Idaho Copper Criteria for Aquatic Life*" DEQ provides potential conservative criteria estimates to use if there is insufficient data to produce site specific BLM criteria. Since there is insufficient data for the BLM input parameters for the receiving waters, Table 2 from this Guidance was used to estimate the applicable criteria. The Guidance contains several different regional classifications to determine the criteria to use. US Silver's facilities are located in the Panhandle Basin which has the most stringent criteria except for Mountains Stream site class. Lake Creek and the SFCdA River are classified as mountain streams so the acute and chronic criteria will be 1.0 and 0.6 ug/L, respectively.

<u>Cadmium, Lead and Zinc</u>

IDAPA 58.02.01.284 contains site specific criteria for cadmium, lead and zinc. The following criteria are to be met dependent upon the hardness, expressed as mg/l of calcium carbonate, of the water. Criterion maximum concentrations (CMC), one (1) hour average concentrations, and criterion continuous concentrations (CCC), four (4) day average concentrations, of the dissolved metals (in µg/l) are not to exceed, more than once every three (3) years, the values calculated using the following equations:

Cadmium.

a. $CMC = 0.973 \times e^{[(1.0166 * \ln(H)) - 3.924]}$

b. $CCC = [1.101672 - (\ln (H)*0.041838] * e^{[(0.7852*\ln(H)) - 3.490]}$

Lead.

a. $CMC = e^{[(0.9402*\ln(H)) + 1.1834]}$ b. $CCC = e^{[(0.9402*\ln(H)) - 0.9875]}$

Zinc.

a. CMC = $e^{[(0.6624*\ln(H)) + 2.2235]}$ b. CCC = $e^{[(0.6624*\ln(H)) + 2.2235]}$

The effluent limitations for cadmium, lead and zinc have changed from the previous permit because new data collected during the permit cycle has a different coefficient of variation than the previous data set. Also, the previous permit used the effluent hardness when the WQS specify using the hardness at the critical flow (see Hardness discussion in Appendix C).

Mercury

Methylmercury fish tissue criterion

DEQ has determined that facility monitoring is not necessary at this time because fish tissue sampling for methylmercury has already been completed. In 2016, fish in the South Fork Coeur d'Alene River were collected by DEQ at various locations including below the Couer and Galena outfalls to determine concentrations of methylmercury in their tissue. The purpose of this monitoring was to determine if there are human health risks from the consumption of fish in the SFCdA River. Data indicated that methylmercury in the SFCdA River fish tissue does not result in elevated human health risks from consumption (Draft Letter Health Consultation Coeur d'Alene Basin Fish Tissue Analysis and Consumption Advisory, Coeur d'Alene Idaho, November, 2018). Results of this monitoring effort will be reported by the Idaho Department of Health and Welfare in 2019. DEQ has determined that this monitoring data meets sufficient rigor, quality and relevance to determine if an impairment of a beneficial use exists, to update the Integrated Report, and inform future permits (IDAPA 58.01.02.054.05). No additional monitoring is required to accomplish these tasks. In addition, fish populations in the SFCdA River are depressed and additional lethal sampling of these populations is unwarranted. As such, the EPA is not proposing monitoring in the draft permit.

Mercury water column aquatic life criteria

While the EPA approved Idaho's adoption of the fish tissue criterion in September 2005, it had withheld judgment on Idaho's removal of aquatic life criteria. On December 12, 2008, the EPA disapproved Idaho's removal of the old aquatic life criteria. Therefore, the aquatic life water column criteria for total recoverable mercury published in 2004 Idaho Administrative Code continue to apply and are effective for CWA purposes.

The effluent limitations for mercury have changed from the previous permit because new data collected during the permit cycle have a different coefficient of variation than the previous data set and different flows were used for the flow tiered effluent limitations.

WET

The draft permit includes WET monitoring and establishes trigger levels for each outfall. If the trigger level is exceeded, then additional WET testing and, potentially, investigations to reduce toxicity are required. The trigger levels were calculated based on the WET criteria, receiving water flow, effluent flow, and available dilution. The trigger levels were calculated using the following mass- balance equation (this is basically the same as Appendix C - Equation 4):

$$\text{WET toxicity trigger} = \frac{\text{criterion} \times [Qe + (Qu \times MZ)] - (Cu \times Qu \times MZ)}{Qe}$$

where,

criterion = 1 TUc for compliance with the chronic criterion
Qe = effluent flow
Qu = upstream flow
Cu = upstream concentration = 0 (assumes no upstream toxicity)
MZ = mixing zone = 0.25 for compliance with chronic policy

Table 13: Chronic Toxicity Triggers and Receiving Water Concentrations

Outfall	Flow Tier (based on flow directly upstream of the outfall in cfs)	Chronic Toxicity Trigger, TU_C	Receiving Water Concentration (RWC), % effluent
001 Effluent Flow of 4.59 cfs	<0.51 (at the 1Q10 of 0.15)	1.01	99%
	≥ 0.51 to <1.9	1.03	97%
	≥ 1.9 to < 5.99	1.1	91%
	≥ 5.99 to < 21.3	1.3	75%
	≥ 21.3	2.2	46%
002 Effluent Flow of 1.88 cfs	<60.4 (at the 1Q10 of 59)	9.04	11%
	≥60.4 to <63	9.38	11%
	≥63 to <87	12.57	8%
	≥87 to <135	18.95	5%
	≥1135	151.93	1%

Hexavalent Chromium

The current permit requires quarterly effluent monitoring for hexavalent chromium (Cr VI). Only one sample taken under the previous permit was reported above the detection level so the EPA is not establishing an effluent limitation at this time. The same sampling requirement is proposed in the draft permit.

TSS

The TMDL for sediments contains a concentration WLA and a loading WLA for sediment in the discharges from Outfalls 001 and 002. Pursuant to 40 CFR 122.44(d)(1)(vii)(B), the permitting authority must include effluent limits in a permit that are consistent with the assumptions of the WLAs in a TMDL. The concentration WLA is the same as the TBEL discussed above but the loading WLA does not correspond to the typical equation using concentration and flow to determine the loading, rather the annual load is set in the TMDL. Therefore, a daily load is determined as follows:

Outfall 001: 36.9 tons/yr * 2000 lbs/ton / 365 days/yr = 202 lbs/day

Outfall 002: 14.6 tons/yr * 2000 lbs/ton / 365 days/yr = 80 lbs/day

These limitations correspond to the average monthly loading limitations in the previous permit.

These limitations will be expressed as an annual average for each outfall. The annual average TSS load must be calculated as the sum of all daily loads calculated for TSS during a calendar year, divided by the number of days sampled for TSS during that year. The daily loads must be calculated using the concentration and the flow measured on the day the sample was collected.

Mass-Based Limitations

The federal regulation at 40 CFR 122.45(f) requires that effluent limitations be expressed in terms of mass, except under certain conditions. The mass based limitations are expressed in pounds per day and are calculated as follows:

Mass based limitation (lb/day) = concentration limitation (mg/L) × flow (mgd) × 8.34[1]

The EPA utilized the 99th percentile effluent flow for use in determining the mass based limitations proposed in the draft permit.

E. Antibacksliding

CWA § 402(o) and federal regulations at 40 CFR §122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limitations, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions.

An anti-backsliding analysis was done for cadmium, lead and zinc at Outfall 001. In general, IDAPA 58.01.02.055.04 prohibits further impairment of waters by point sources prior to development of a total maximum daily load. The SFCdA River is impaired due to excess cadmium, lead, and zinc. Lake Creek is a tributary to the SFCdA River and the Outfall 001 discharge is located approximately 0.3 miles upstream from the confluence. Any increase of metals from Outfall 001 is likely to reach the river. To prevent further degradation of an already impaired waterbody, the causative pollutants (cadmium, lead, and zinc) cannot increase beyond the limits in the 2007 permit (IDAPA 58.01.02.052.07). Effluent limits for cadmium, lead, and zinc were retained from the previous permit for Outfall 001 when less stringent effluent limitations were calculated using the process in Appendix C. All effluent limitations for cadmium, lead and zinc at Outfall 002 were as or more stringent than those in the previous permit so backsliding is not a concern.

An anti-backsliding analysis was done for the hardness based copper effluent limitation and mercury effluent limations for discharges from Outfall 001 or 002. All effluent limitations for Outfall 003 are as strigent or more stringent than the previous permit effluent limiations so backsliding is not an issue.The copper effluent limitations based on the BLM are more stringent that the copper effluent limitations in the previous permit for all outfalls so backsliding will not occur if those effluent limitations are contained in the final permit.

CWA § 303(d)(4)(B) provides an exception against the prohibition on backsliding from a water quality-based effluent limitation. Specifically, when water quality meets or exceeds

[1] 8.34 is conversion factor with units (lb ×L)/(mg × gallon×10^6)

applicable water quality standards for a specific parameter, a permit can contain less stringent effluent limits than the previous permit if the revision is consistent with the State's approved antidegradation policy. With regard to copper and mercury for Outfall 001/002, backsliding can occur because because the receiving water quality meets water quality standards, and because DEQ found the changes to the effluent limitations in the draft permit to be insignificant thus meeting the state of Idaho's antidegradation policy (See Appendix D). The EPA has reviewed the State's antidegradation analysis.

VI. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

CWA § 308 and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to the EPA.

B. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

C. Surface Water Monitoring

In general, surface water monitoring is required for pollutants of concern to assess the assimilative capacity of the receiving water, for a pollutant. In addition, surface water monitoring may be required for pollutants for which the water quality criteria are hardness dependent and to collect data for TMDL development if the facility discharges to an impaired water body. Table 13 presents the proposed surface water monitoring requirements upstream of Outfalls 001 and 002. The draft permit also requires monitoring downstream of each outfall to collect data for site specific copper BLM criteria for the next permit cycle. Table 13 also presents these requirements.

1. Monitoring stations must be established at the following locations:
   a. in Lake Creek directly upstream of Outfall 001,
   b. below Outfall 001 at a point where the effluent and Lake Creek are completely mixed,
   c. in the SFCdA River directly upstream of Outfall 002, and
   d. below Outfall 002 at a point where the effluent and the SFCdA River are completely mixed.

   Sampling locations must be approved by DEQ.
2. All locations must be monitored according to the sampling frequency in Table 13

(Table 5 of the draft permit). The results of quarterly sampling must be submitted with the DMRs for March, June, September and December.

3. To the extent practicable, surface water sample collection must occur on the same day as effluent sample collection.
4. All ambient samples, except continuous temperature monitoring, must be grab samples.
5. Antimony, arsenic, cadmium, chromium, copper, lead, nickel, and zinc must be analyzed as dissolved. Mercury must be analyzed as total recoverable.
6. Samples must be analyzed for the parameters and achieve MDLs that are equivalent to or less than those listed in Table 13. The permittee may request different MDLs. Such a request must be in writing and must be approved by EPA.

Table 13: Surface Water Monitoring Requirements

Parameter	Units	Upstream Sampling Frequency	Downstream Sampling Frequency	Method Detection Limit (MDL)
Flow	cfs	Daily	Monthly	NA
Cadmium, dissolved	ug/L	Quarterly	Quarterly	0.1
Antimony	ug/L	Quarterly	-- [2]	1.0
Arsenic [1]	ug/L	Quarterly	-- [2]	0.5
Copper, dissolved	ug/L	Quarterly	Monthly	1
Chromium VI	ug/L	Quarterly	-- [2]	1.2
Lead, dissolved	ug/L	Quarterly	Quarterly	5.0
Mercury, total	ug/L	Quarterly	Quarterly	0.001
Zinc, dissolved	ug/L	Quarterly	Quarterly	10
pH	standard units	Quarterly	Monthly [1, 3]	NA
Temperature	^{o}C	Continuous [4, 5]	Continuous [4, 5]	± 2
Temperature	^{o}C	--- [6]	Quarterly [4, 5]	± 2
Hardness (as $CaCO_3$)	mg/l	Quarterly	Monthly	0.2
Dissolved Organic Carbon	mg/L	--- [6]	Monthly	1
Calcium	ug/L	--- [6]	Monthly	10
Magnesium	ug/L	--- [6]	Monthly	50
Sodium	ug/L	--- [6]	Monthly	30

Table 13: Surface Water Monitoring Requirements				
Parameter	Units	Upstream Sampling Frequency	Downstream Sampling Frequency	Method Detection Limit (MDL)
Potassium	mg/L	--- [6]	Monthly	0.3
Sulfate (as SO_4)	mg/L	--- [6]	Monthly	0.2
Chloride	mg/L	--- [6]	Monthly	1
Alkalinity (as $CaCO_3$)	mg/L Ca	--- [6]	Monthly	5

1 - Arsenic monitoring is only required in Lake Creek.

2 - Downstream sampling not required.

3 - pH can vary widely diurnally, it is important to consider the diurnal variation when sampling.

4 – Water chemistry data collected for use in the biotic ligand model shall follow the *Implementation Guidance for the Idaho Copper Criteria for Aquatic Life*. August 2017.

After 24 consecutive monthly samples for the copper BLM have been collected, instream monitoring may be decreased to quarterly after DEQ review and approval of data quality.

Upon DEQ approval of the 24 consecutive monthly instream samples for the copper BLM criteria, the permittee may request reopening of the permit to recalculate the copper BLM effluent limits using the updated copper BLM criteria.

5 - See b., below.

6 - Upstream sampling not required.

a. Certain constituents must be monitored downstream of each outfall to determine a outfall specific BLM criteria for copper. DEQ submitted these criteria to the EPA for action in January 2019. If the EPA approves the criteria prior to final issuance then, as discussed above, the default values from the DEQ Guidance will be used to develop effluent limitations. If the criteria have not been approved, then the current hardness based criteria will be used. The collection of the data specified in Table 13 (Table 5 of the draft permit) will serve to develop outfall specific criteria.

b. Temperature shall be sampled for at least two consecutive years during the June through November timeframe. Temperature monitoring shall begin after the effective date of the permit on June 1 and ending November 30. After two consecutive years of data, no surface water temperature monitoring is required other than necessary for the copper BLM. Permittee shall contact DEQ Coeur d'Alene Regional Office prior to start of temperature monitoring to obtain frequency of data collection and location of the monitoring (see Appendix D, Draft CWA § 401 Certification).

5. River Flow Monitoring: The draft permit requires that daily streamflow be monitored for Lake Creek directly upstream of Outfall 001 and the SFCdA River directly upstream of Outfall 002. This information will determine the stream flows used in the next permit reissuance. The permittee must report the average monthly flow on the DMR.

6. Bioassessment Monitoring. Annual instream bioassessment monitoring was conducted during the last permit cycle. DEQ has determined that enough data has been collected to analyze the impact of the discharges to the beneficial uses. As such, bioassessment monitoring is not included in the draft permit.

7. Seepage Study

   A seepage study for Lake Creek Pond 3 and the Osburn tailings impoundment was conducted under the 2007 permit. The results for Pond 3 were indeterminable and de minimus for the tailings impoundment. US Silver did not apply for permit coverage for any seepage discharges; therefore, the draft permit does not apply to discharges other than those from the designated outfalls.

8. Electronic Submission of Discharge Monitoring Reports

   The draft permit requires that the permittee submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application.

   The EPA currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: https://netdmr.epa.gov. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

VII. Other Permit Conditions

A. Compliance Schedules

1. Copper BLM

   Compliance schedules are authorized by federal NPDES regulations at 40 CFR 122.47 and Idaho WQS at IDAPA 58.01.02.400.03. Compliance schedules allow a discharger to phase in, over time, compliance with water quality-based effluent limitations when limitations are in the permit for the first time.

   Pursuant to IDAPA 58.01.02.400.03, DEQ may authorize compliance schedules for water quality-based effluent limits issued in a permit for the first time. Although the copper BLM-based criteria are not currently in effect, for reasons of efficiency, DEQ is proposing the compliance schedule found in Appendix D of this Fact Sheet or Permit Part II.A. in the event the BLM based copper criteria becomes effective (obtains EPA approval) prior to issuance of the final permit. The Galena Complex cannot immediately achieve compliance with the BLM based effluent limits for copper; therefore, DEQ proposed to authorize a compliance schedule and interim requirements. This compliance schedule is only effective if BLM based copper effluent limits are retained in the final permit.

   The Galena Complex relies on settlement of solids in tailings impoundments as their only means of water treatment. This method cannot reliably reduce metals concentrations to meet the copper BLM effluent limits. If the final permit contains the BLM limits, this compliance schedule will be used to ensure that the facility has the time to construct a water treatment plant capable of copper removal. Due to the large capital investment needed to construct a water treatment plant and capture and treat effluent from both outfalls, DEQ authorizes a period of twelve (12) years

from the effective date of the final permit to meet final effluent limits for copper. The compliance schedule and interim requirements provides the permittee a reasonable amount of time to achieve the final effluent limits as specified in the permit. At the same time, the schedule ensures that compliance with final effluent limits is accomplished as soon as possible.

2. Other Metals

The Galena Complex cannot immediately achieve compliance at Outfall 001 with the cadmium, lead, mercury, and hardness-based copper effluent limitations and at Outfall 002 with the lead, zinc, and hardness-based copper effluent limitations; therefore, DEQ authorizes a compliance schedule and interim requirements as set forth below. Similar to the copper BLM discussion above, the Galena Complex relies on settlement of solids in tailings impoundments as their only means of water treatment. This method cannot reliably reduce metals concentrations to meet new cadmium, hardness-based copper, lead, zinc and mercury effluent limits.

The compliance schedule for hardness-based copper is only effective if the BLM based copper effluent limits are not retained in the final permit. If BLM based copper effluent limits are retained in the final permit this compliance schedule runs concurrent to the compliance schedule for the copper BLM based effluent limits for twelve (12) years. If the BLM based copper effluent limits are not retained in the final permit, this first two years of this compliance schedule are eliminated because progress towards meeting final effluent limits does not rely on collection of data for the BLM and the schedule is reduced to a ten (10) year length of time.

Lower effluent limitations for cadmium, lead, zinc, mercury and hardness-based copper are in the permit for the first time due to the following factors:

(1) Mixing zones authorized by this certification for copper and mercury for some flow tiers at both Outfalls are smaller than those authorized for the current permit.

(2) The current permit used an estimated flow for Lake Creek. The proposed permit used actual flow data collected by the permittee which lowered effluent limits for copper and mercury at Outfall 001. There is less water available for dilution than previously estimated.

(3) A different CV was used in the statistical analysis for all metals to develop effluent limits for both Outfalls. In the case of cadmium and lead at Outfall 001 the new CVs decreased effluent limits.

(4) An increase in effluent flow from the last permit cycle increased loading for all pollutants at both Outfalls.

(5) The correction of an error discovered in the previous permit resulted in decreased limitations for cadmium, lead, and zinc for Outfall 002. The compliance schedule allows the permittee time to develop treatment technologies to comply with their new limits. No compliance schedule is authorized for cadmium at Outfall 002 because the permittee can meet the new limits. This error only affected effluent limitations for cadmium, lead, and zinc for Outfall 002. Outfall 001 was unaffected because Lake Creek is an

effluent dominated stream during critical low flow timeframes. As a result there was little change in hardness used to calculate criteria for Outfall 001.

To give the permittee time to meet their final effluent limits, a 12 year compliance schedule is authorized. This schedule, by necessity, tracks with the copper BLM schedule since the same planning, design, and construction will be required to meet final effluent limitations for cadmium, hardness-based copper, lead, zinc and mercury

B. Quality Assurance Plan (QAP)

The Permittee is required to update the QAP within **60 days** of the effective date of the final permit. The QAP must include standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and DEQ upon request.

C. Best Management Practices (BMP) Plan

The permit requires a BMP Plan be developed (or modified) and implemented to prevent or minimize the generation and the potential for the release of pollutants from the facility to the waters of the United States through normal and ancillary activities. The permittee is required to develop or modifiy an existing BMP Plan for their facility and implement the Plan within **60 days** of the effective date of the final permit. The plan must be retained on site and made available to the EPA and DEQ upon request.

D. Environmental Justice

As part of the permit development process, EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. “Overburdened” communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. The EPA used a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

The facility is not located within or near a Census block group that is potentially overburdened. The draft permit does not include any additional conditions to address environmental justice.

Regardless of whether a facility is located near a potentially overburdened community, the EPA encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see https://www.federalregister.gov/d/2013-10945). Examples of promising practices include: thinking ahead about community’s characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

For more information, please visit https://www.epa.gov/environmentaljustice and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.

E. Standard Permit Provisions

Permit Parts III., IV. and V. contain standard regulatory language that must be included in all NPDES permits. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. A review of the threatened and endangered species located in Idaho finds that there are no endangered aquatic species in the vicinity of the discharges and no designated critical habitat. Therefore, the EPA determines that there will be no effect on threatened or endangered species.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH). A review of the Essential Fish Habitat documents shows that there are no managed fisheries in the area of the discharge.

The EPA determines that issuance of this permit will have no effect on EFH.

C. State Certification

CWA § 401 requires the EPA to seek State certification before issuing a final permit. As a result of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with water quality standards, or treatment standards established pursuant to any State law or regulation. A copy of the draft CWA § 401 certification is provided in Appendix D.

D. Antidegradation

DEQ has completed an antidegradation review which is included in the draft CWA § 401 certification for this permit. (*See* Appendix D) The EPA has reviewed this antidegradation analysis and finds that it is consistent with the State's water quality standards and the State's antidegradation implementation procedures. Comments on the CWA § 401 certification including the antidegradation review can be submitted to DEQ as set forth above (see FS 1).

E. Permit Expiration

The permit will expire five years from the effective date.

IX. References

NPDES Permit No. ID0000027 Renewal Application. December 2011.

Seepage Study and Hydrological Analysis Report prepared by Hydrometrics, Inc. (Coeur d'Alene, Idaho) for US Silver Corporation. December 2011.

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001. https://www3.epa.gov/npdes/pubs/owm0264.pdf

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EPA. 2014. Water Quality Standards Handbook Chapter 5: General Policies. Environmental Protection Agency. Office of Water. EPA 820-B-14-004. September 2014. https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf

40 CFR 122 – EPA administered permit programs: the National Pollutants Discharge Elimination System.

40 CFR 124 – Procedures for Decisionmaking

40 CFR 440 Subpart J - Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory.

USFWS, 2019. IPaC (Information for Planning and Consultation) updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project. Consultation Code: 01EIFW00-2018-SLI-0088 Event Code: 01EIFW00-2019-E-00285 Project Name: US Silver and Hecla Mines.

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DEQ, 2002. South Fork Coeur d'Alene River Sediment Subbasin Assessment and Total Maximum Daily Load, Idaho Department of Environmental Quality, Coeur d'Alene Regional Office. May 17, 2002. https://www.deq.idaho.gov/media/454003-_water_data_reports_surface_water_tmdls_cda_river_sf_cda_river_sf_sed_entire.pdf

DEQ 2017. Implementation Guidance for the Idaho Copper Criteria for Aquatic Life: Using the Biotic Ligand Model. Idaho Department of Environmental Quality, Water Quality Division, Boise, Idaho. November 2017. http://air.idaho.gov/media/60180840/58-0102-1502-implementation-guidance-idaho-copper-criteria-aquatic-life-1117.pdf

DEQ 2017b. Draft Idaho Antidegradation Implementation Procedures. August 2017.

Appendix A.Facility Information

Outfall 001 ● Outfall 002 ■

Appendix B.Water Quality Data

A. Effluent Data – Outfall 001

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
All values in ug/L unless otherwise noted.																			
1/4/13	0.127	4.28	9.95	2.26	0	1/1/13	1	7	30	0.1	698	1/4/13	7.53	9.9	<1.00			na	na
1/11/13	0.0001	1.94	7.31	2.1	0	1/2/13	1.1	4	29	0.3	759	1/11/13	7.59	12.4	<1.00		141		
1/17/13	0.0001	4.19	5.73	3.08	0	2/1/13	1	7	30	0.1	698	1/17/13	8.25	24.7	1.4	50			
1/24/13	0.0001	4.67	7.12	3.49	0.027	2/2/13	1.1	4	29	0.3	759	1/24/13	6.88	14.3	1.2				
1/31/13	0.0001	9.02	7.15	3.49	0	3/1/13	1	7	30	0.1	698	1/31/13	7.61	11.7	1.4				
2/7/13	0.0001	7.3	6.6	6.6	0	3/2/13	1.1	4	29	0.3	759	2/7/13	7.54	13.9	<1.00			1	
2/14/13	0.0001	9.9	6.9	4.9	0	4/1/13	1	7	30	0.1	698	2/14/13	7.79	13.4	2	140	140		<8.0
2/22/13	0.0001	2.2	3.8	3.4	0	4/2/13	1.1	4	29	0.3	759	2/22/13	8.4	12.5	3				
2/27/13	0.0001	5.1	3.8	2.6	0	5/1/13	1	7	30	0.1	698	2/27/13	8.8	13.1	<1.00				
3/6/13	0.0001	8.1	5.8	3.7	0	5/2/13	1.1	4	29	0.3	759	3/6/13	7.45	17	2			na	na
3/14/13	0.0001	5.6	5.6	3.8	0	6/1/13	1	7	30	0.1	698	3/14/13	7.52	21.9	<1.0		120		
3/20/13	0.0001	3.6	0.0025	0.3	0	6/2/13	1.1	4	29	0.3	759	3/20/13	7.51	17.1	<1.0				
3/27/13	0.0001	5.9	5.9	3.4	0	7/1/13	1	7	30	0.1	698	3/27/13	7.31	18.3	<1.0	900			
4/5/13	0.0001	20	10	7.6	0	7/2/13	1.1	4	29	0.3	759	4/5/13	na	na	4			na	na
4/10/13	0.0001	7.3	0.0025	16	0	8/1/13	1	7	30	0.1	698	4/10/13			3	50	150		
4/15/13	0.0001	4.85	0.0025	0.3	0	8/2/13	1.1	4	29	0.3	759	4/17/13			0				
4/17/13	0.0001	2.8	0.0025	0.3	0	9/1/13	1	7	30	0.1	698	4/25/13			0				
4/25/13	0.0001	4.6	0.0025	0.3	0	9/2/13	1.1	4	29	0.3	759	5/1/13	7.94	20.1	14				
4/26/13	0.0001	3.04	0.0025	3.11	0	10/1/13	1	7	30	0.1	698	5/9/13	8.02	21.4	2				
4/29/13	0.0001	4.66	0.0025	2.48	0	10/2/13	1.1	4	29	0.3	759	5/16/13	7.52	15.1	1	22	130		0
4/30/13	0.0001	4.58	0.0025	1.72	0	11/1/13	1	7	30	0.1	698	5/23/13	7.16	17.9	10				
5/1/13	0.0001	14	0.0025	0.3	0	11/2/13	1.1	4	29	0.3	759	5/29/13	7.34	20.1	0				
5/8/13	0.0001	3.25	0.0025	2.25	0	12/1/13	1	7	30	0.1	698	6/5/13	7.9	17.3	0				
5/9/13	0.0001	3.2	0.0025	0.3	0	12/2/13	1.1	4	29	0.3	759	6/13/13	8.75	18.2	0				
5/16/13	0.0001	4.4	0.0025	2.9	0	1/1/14	1	7	30	0.1	698	6/19/13	8.41	18.7	0	4	130	na	na
5/23/13	0.0001	14	0.0025	5.6	0	1/2/14	1.1	4	29	0.3	759	6/26/13	8.41	17.3	0				
5/29/13	0.0001	4.6	0.0025	0.3	0	2/1/14	1	7	30	0.1	698	7/1/13	8.43	23.1	1				
6/5/13	0.0001	3.8	0.0025	0.3	0	2/2/14	1.1	4	29	0.3	759	7/9/13	8.77	19.9	1	4	140	na	na
6/12/13	0.0001	3.8	0.0025	0.3	0	3/1/14	1	7	30	0.1	698	7/15/13	8.2	19.8	0				
6/19/13	0.0001	3.6	0.0025	0.3	0	3/2/14	1.1	4	29	0.3	759	7/22/13	8.1	21.6	1				

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
6/26/13	0.0001	9.5	0.0025	3.2	0	4/1/14	1	7	30	0.1	698	7/29/13	8.41	20.8	0				
7/1/13	0.0001	3.7	0.0025	0.3	0	4/2/14	1.1	4	29	0.3	759	8/7/13	8.71	20	0				
7/9/13	0.0001	2.3	4	0.3	0	5/1/14	1	7	30	0.1	698	8/13/13	8.66	21.8	0	13	130		0
7/15/13	0.0001	3.9	0.0025	0.3	0	5/2/14	1.1	4	29	0.3	759	8/19/13	7.92	20.4	0				
7/22/13	0.0001	3.4	0.0025	0.3	0	6/1/14	1	7	30	0.1	698	8/26/13	8.52	18.9	0				
7/29/13	0.0001	0.03	0.0025	0.3	0	6/2/14	1.1	4	29	0.3	759	9/3/13	7.53	9.9	0				
8/7/13	0.0001	0.03	0.0025	0.3	0	7/1/14	1	7	30	0.1	698	9/13/13	7.59	12.4	0		130	na	na
8/13/13	0.0001	0.03	0.0025	5.6	0	7/2/14	1.1	4	29	0.3	759	9/19/13	8.25	24.7	0				
8/19/13	0.0001	0.03	0.0025	0.3	0	8/1/14	1	7	30	0.1	698	9/22/13	6.88	14.3	1				
8/26/13	0.0001	0.03	0.0025	0.3	0	8/2/14	1.1	4	29	0.3	759	10/1/13	6.7	10.8	0				
9/3/13	0.0001	0.03	0.0025	0.3	0	9/1/14	1	7	30	0.1	698	10/8/13	7.8	12.4	2		120	na	na
9/10/13	0.0001	0.03	0.0025	0.3	0	9/2/14	1.1	4	29	0.3	759	10/15/13	8	17.3	2	4			
9/17/13	0.0001	0.03	0.0025	0.3	0	10/1/14	1	7	30	0.1	698	10/22/13	7.83	13.8	9				
9/24/13	0.0001	0.03	0.0025	2.7	0	10/2/14	1.1	4	29	0.3	759	10/29/13	8.33	9.1	4				
10/1/13	0.0001	7.7	0.0025	0.3	0	11/1/14	1	7	30	0.1	698	11/6/13	7.99	7.4	2				
10/8/13	0.0001	6.7	0.0025	0.3	0	11/2/14	1.1	4	29	0.3	759	11/12/13	7.58	3.5	2	140	130	na	0
10/15/13	0.0001	2.9	0.0025	2.6	0	12/1/14	1	7	30	0.1	698	11/19/13	7.36	4.5	9				
10/22/13	0.0001	0.03	0.0025	0.3	0	12/2/14	1.1	4	29	0.3	759	11/26/13	8.21	8.7	3				
10/29/13	0.0001	9.3	0.0025	0.3	0	1/1/15	1	7	30	0.1	698	12/2/13	7.65	11.5	1				
11/6/13	0.0001	13	2.6	4.3	0	1/2/15	1.1	4	29	0.3	759	12/11/13	7.73	6	8	140		1	0
11/12/13	0.0001	28	4.7	6.9	0	2/1/15	1	7	30	0.1	698	12/19/13	7.41	9.2	2		130		
11/19/13	0.0001	25	5.2	16	0	2/2/15	1.1	4	29	0.3	759	12/23/13	7.73	8.8	2				
11/26/13	0.0001	12	5.2	3.4	0	3/1/15	1	7	30	0.1	698	1/1/14	8.64	6	1				
12/2/13	0.0001	12	0.0025	4.2	0	3/2/15	1.1	4	29	0.3	759	1/8/14	7.65	10.6	22			0	0
12/11/13	0.0001	37	8.6	9.8	0	4/1/15	1	7	30	0.1	698	1/15/14	7.93	5.8	3	13	130		
12/19/13	0.0001	3.1	0.0025	0.3	0	4/2/15	1.1	4	29	0.3	759	1/22/14	7.97	5.6	2				
12/23/13	0.0001	2.9	0.0025	0.3	0	5/1/15	1	7	30	0.1	698	1/30/14	8	8.8	0				
1/1/14	0.0001	2.3	0.0025	0.3	0	5/2/15	1.1	4	29	0.3	759	2/6/14	7.82	4.8	15		120		
1/8/14	0.0001	52	19	18	0	6/1/15	1	7	30	0.1	698	2/12/14	8.01	6.1	3	130		0	0
1/15/14	0.0001	8.9	2.8	4.7	0	6/2/15	1.1	4	29	0.3	759	2/19/14	7.51	4.6	4				
1/22/14	0.0001	5.1	0.0025	4.2	0	7/1/15	1	7	30	0.1	698	2/27/14	7.69	9.9	3.1				
1/30/14	0.0001	3.3	0.0025	0.3	0	7/2/15	1.1	4	29	0.3	759	3/5/14	7.58	4.6	2.1				
2/6/14	0.0001	5.9	0.0025	5.3	0	8/1/15	1	7	30	0.1	698	3/13/14	7.92	5.6	3		104	0	0
2/12/14	0.0001	5	0.0025	0.3	0	8/2/15	1.1	4	29	0.3	759	3/18/14	7.6	12.7	2.7	13			
2/19/14	0.0001	21	5	5.9	0	9/1/15	1	7	30	0.1	698	3/26/14	7.1	13.2	0				

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
2/27/14	0.0001	1.9	5.06	3.41	0	9/2/15	1.1	4	29	0.3	759	4/1/14	7.14	7.4	0				
3/5/14	0.0001	8.56	0.0025	2.73	0	10/1/15	1	7	30	0.1	698	4/11/14	7.57	2.9	1.1	5	119	0	0
3/13/14	0.0001	0.306	0.148	0.158	0	10/2/15	1.1	4	29	0.3	759	4/18/14	7.47	12.8	0				
3/18/14	0.0001	5.46	0.0025	2.73	0	11/1/15	1	7	30	0.1	698	4/24/14	6.84	13.1	1.1				
3/26/14	0.0001	5.01	0.0025	2.8	0	11/2/15	1.1	4	29	0.3	759	5/1/14	7.27	17.8	0				
4/1/14	0.0001	3.54	0.0025	3.85	0	12/1/15	1	7	30	0.1	698	5/8/14	7.67	15.3	1.8		124	<1.0	0
4/11/14	0.0001	10	5.74	2.51	0	12/2/15	1.1	4	29	0.3	759	5/15/14	7.7	17.3	3.6	5			
4/18/14	0.0001	4.95	0.0025	1.9	0	1/1/16	1	7	30	0.1	698	5/23/14	8.14	21.7	2.4				
4/24/14	0.0001	8.21	0.0025	3.6	0	1/2/16	1.1	4	29	0.3	759	5/28/14	8.06	17.9	0				
5/1/14	0.0001	7.32	0.0025	2.26	0	2/1/16	1	7	30	0.1	698	6/4/14	7.49	17.9	8.02				
5/8/14	0.0001	7.34	0.0025	2.99	0	2/2/16	1.1	4	29	0.3	759	6/13/14	8.46	18	1.4	49	126	na	0
5/15/14	0.0001	7.55	0.0025	2.65	0	3/1/16	1	7	30	0.1	698	6/18/14	7.75	15	3.1				
5/23/14	0.13	13.4	0.0025	2.9	0	3/2/16	1.1	4	29	0.3	759	6/25/14	7.65	20.1	0				
5/28/14	0.0001	5.84	0.0025	1.87	0	4/1/16	1	7	30	0.1	698	7/2/14	7.72	15.9	1.9				
6/4/14	0.0001	16.6	0.0025	3.25	0	4/2/16	1.1	4	29	0.3	759	7/10/14	7.68	27.3	0	7	135	na	0
6/13/14	0.0001	10.7	0.0025	2.54	0	5/1/16	1	7	30	0.1	698	7/16/14	8.12	25.4	0				
6/18/14	0.0001	13.1	0.0025	1.57	0	5/2/16	1.1	4	29	0.3	759	7/23/14	7.85	21.6	0				
6/25/14	0.0001	11.9	0.0025	2.12	0	6/1/16	1	7	30	0.1	698	7/30/14	8.18	23.1	0				
7/2/14	0.0001	9.77	0.0025	2.16	0	6/2/16	1.1	4	29	0.3	759	8/6/14	7.78	22	0				
7/10/14	0.0001	7.03	0.0025	2.22	0	7/1/16	1	7	30	0.1	698	8/15/14	7.83	22.3	0	23	144	<1.0	0
7/16/14	0.0001	1.88	0.0025	2.06	0	7/2/16	1.1	4	29	0.3	759	8/22/14	6.7	18.2	0				
7/23/14	0.0001	5.87	0.0025	2.02	0	8/1/16	1	7	30	0.1	698	8/29/14	7.61	19.5	0				
7/30/14	0.0001	6.03	0.0025	1.67	0	8/2/16	1.1	4	29	0.3	759	9/5/14	7.9	14.1	0				
8/6/14	0.0001	4.55	0.0025	2.47	0	9/1/16	1	7	30	0.1	698	9/12/14	7.81	16.3	0	23	154	na	na
8/15/14	0.0001	8.44	0.0025	1.42	0	9/2/16	1.1	4	29	0.3	759	9/19/14	7	20.8	1.1				
8/22/14	0.0001	12.8	0.0025	2.73	0	10/1/16	1	7	30	0.1	698	9/26/14	7.29	18.1	3				
8/29/14	0.0001	5.01	0.0025	1.69	0	10/2/16	1.1	4	29	0.3	759	10/3/14	7.32	4.8	1.2				
9/5/14	0.0001	16.4	0.0025	0.3	0	11/1/16	1	7	30	0.1	698	10/9/14	7.5	14.7	0			na	na
9/12/14	0.0001	15.3	0.0025	2.2	0	11/2/16	1.1	4	29	0.3	759	10/17/14	7.44	11.8	1	33	155		
9/19/14	0.0001	20.6	0.0025	2.35	0	12/1/16	1	7	30	0.1	698	10/23/14	7.51	14.6	0				
9/26/14	0.0001	39.1	0.12	4.56	0	12/2/16	1.1	4	29	0.3	759	10/31/14	7.57	15.8	0				
10/3/14	0.0001	12.6	0.0025	2.3	0	1/1/17	1	7	30	0.1	698	11/7/14	7.42	13.4	0				
10/9/14	0.0001	7.6	0.0025	1.82	0	1/2/17	1.1	4	29	0.3	759	11/14/14	7.56	6.9	3			<1.0	na
10/17/14	0.0001	6.49	0.0025	1.45	0	2/1/17	1	7	30	0.1	698	11/18/14	7.67	8.1	2.6	350	172		
10/23/14	0.0001	10.4	0.0025	1.54	0	2/2/17	1.1	4	29	0.3	759	11/25/14	7.12	14.9	0				

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
10/31/14	0.0001	25.6	0.0025	1.68	0	3/1/17	1	7	30	0.1	698	12/5/14	7.16	9.4	1				
11/7/14	0.0001	30.8	0.0025	2.11	0	3/2/17	1.1	4	29	0.3	759	12/12/14	7.43	13.5	1.5	540	138	na	na
11/14/14	0.0001	5.3	7.69	5.51	0	4/1/17	1	7	30	0.1	698	12/19/14	7.4	10.1	1.2				
11/18/14	2.1	19.2	9.09	4.05	0	4/2/17	1.1	4	29	0.3	759	12/24/14	7.34	15.6	0				
11/25/14	0.25	9.36	6.19	2.6	0	5/1/17	1	7	30	0.1	698	1/7/15	7.34	14	2.2				
12/5/14	0.13	17.8	5.31	1.53	0	5/2/17	1.1	4	29	0.3	759	1/14/15	7.51	16.4	0	130	164	na	na
12/12/14	0.0001	1	0.0025	4.86	0	6/1/17	1	7	30	0.1	698	1/21/15	6.67	4.3	1.1				
12/19/14	0.0001	1.86	6.8	2.51	0	6/2/17	1.1	4	29	0.3	759	1/28/15	6.94	9.4	1				
12/24/14	0.0001	2.3	6	3.07	0							2/4/15	7.22	17.8	0				
1/7/15	0.0001	7.4	0.0025	0.3	0							2/11/15	7.16	14.7	2.5	240	129	<1.0	0
1/14/15	0.0001	28.2	0.0025	1	0							2/20/15	7.76	9.8	2.4				
1/21/15	0.0001	14.5	0.0025	1.3	0							2/26/15	7.59	7.7	1.2				
1/28/15	0.4	13.5	65	9	0							3/5/15	7.72	17.1	1.4				
2/4/15	0.47	13.7	0.0025	2.21	0							3/11/15	7.74	15.4	0	33	136		
2/11/15	0.0001	2.3	6.2	3.28	0							3/20/15	7.42	16.1	1.5				
2/20/15	0.0001	45.7	0.0025	0.3	0							3/26/15	7.56	13.5	1.6				
2/26/15	0.0001	27.2	5.32	2	0							4/1/15	7.72	15.3	1.5				
3/5/15	0.0001	4.03	0.0025	0.3	0							4/8/15	7.55	15.2	1.44	23	151		
3/11/15	0.0001	20	0.0025	1.26	0							4/15/15	7.58	16.8	0				
3/20/15	0.0001	35.7	0.0025	2.29	0							4/22/15	7.99	17.4	1				
3/26/15	0.0001	45.4	0.0025	1.71	0							5/6/15	7.64	13.1	5.8				
4/1/15	0.0001	45.4	0.0025	2.1	0							5/13/15	7.82	16.8	0	79	158		0
4/8/15	0.0001	15.8	0.0025	1.45	0							5/20/15	7.83	20.1	0				
4/15/15	0.0001	16.5	0.0025	1.18	0							5/28/15	7.41	22.2	0				
4/22/15	2.6	19	0.0025	2.58	0							6/2/15	7.33	19.8	0				
5/6/15	0.0001	11.1	0.0025	4.87	0							6/9/15	7.73	24.6	0	5	151		0
5/13/15	0.0001	16.4	0.0025	2.06	0							6/19/15	7.52	23.4	1.2				
5/20/15	0.0001	11.4	0.0025	1.22	0							6/24/15	7.92	22.3	0				
5/28/15	0.0001	13.4	0.0025	1.91	0							7/7/15	7.57	25.9	0				
6/2/15	0.0001	6.03	0.0025	1.96	0							7/16/15	7.36	22.1	1	33	178		0
6/9/15	0.0001	17.8	0.0025	2.1	0							7/23/15	7.79	22.7	2.2				
6/19/15	0.0001	20.5	0.0025	1.71	0							7/30/15	7.58	27.6	0				
6/24/15	0.0001	23.6	0.0025	1.68	0							8/5/15	6.67	18.9	0				
7/7/15	0.03	16.8	2.51	1.38	0							8/12/15	7.05	22.6	0	23	162		0
7/16/15	0.2	36.9	6.34	1.78	0							8/18/15	7.83	20.8	2.2				

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
7/23/15	0.0001	33.5	0.0025	1.76	0							8/26/15	8.07	21.1	0				
7/30/15	0.0001	7.2	0.0025	0.3	0							9/3/15	7.57	18.5	1				
8/5/15	0.0001	42.4	0.0025	0.3	0							9/10/15	7.12	19.5	0	5	202		0
8/12/15	0.0001	18.5	0.0025	1.4	0							9/17/15	7.12	15.6	0				
8/18/15	0.0001	24.8	0.0025	5.17	0							9/24/15	7.13	16.6	3.2				
8/26/15	0.0001	8.84	0.0025	1.27	0							10/7/15	6.87	16.4	1.4				
9/3/15	0.0001	15	0.0025	2.18	0							10/14/15	7.4	15.6	0		227		0
9/10/15	0.0001	9.84	0.0025	1.12	0							10/21/15	8.26	15	0				
9/17/15	0.0001	10.3	0.0025	1.36	0							10/29/15	6.92	13.7	3.2	49			
9/24/15	0.0001	56.4	0.0025	2.68	0							11/6/15	7.47	11.7	0			<1.0	
10/7/15	0.0001	26.6	0.0025	2.84	0							11/12/15	7.81	11.8	2.2		177		0
10/14/15	0.0001	29.3	0.0025	3.09	0							11/18/15	7.61	10.4	0				
10/20/15	0.0001	6.49	0.0025	1.51	0							11/25/15	7.58	8.1	0	79			
10/29/15	0.0001	6.49	6.4	1.87	0							12/3/15	7.06	6.3	0				
11/7/15	0.0001	4.15	0.0025	1.89	0							12/9/15	7.88	4.7	0		153		0
11/12/15	0.0001	5.11	0.0025	0.3	0							12/18/15	7.51	13.6	1.2				
11/18/15	0.0001	8.2	6.34	1.57	0							12/22/15	6.84	9.5	2	33			
11/25/15	0.0001	7.91	0.0025	1.4	0							1/7/16	7.04	13.7	1.4				
12/3/15	0.0001	7.17	0.0025	1.44	0							1/14/16	7.5	16.6	1.2		172		0
12/9/15	0.0001	6.74	0.0025	2.76	0							1/21/16	6.87	11.2	1.8	22			
12/18/15	0.0001	5.83	0.0025	1.75	0							1/26/16	6.8	9.5	2.6				
12/22/15	0.0001	44.2	0.0025	1.08	0							2/4/16	6.95	8.7	2.2				
1/7/16	0.0001	1.46	6.11	2.39	0							2/10/16	7.2	14.3	3.8		173	1	0
1/14/16	0.0001	29.4	0.0025	0.3	0							2/17/16	7.56	9.9	2	46			
1/21/16	0.0001	26.9	0.0025	2.39	0							2/24/16	7.77	5.5	1.4				
1/26/16	0.0001	22.4	0.0025	2.66	0							3/4/16	7.41	17.7	3.2				
2/4/16	0.0001	33.8	0.0025	1.95	0							3/9/16	8	12.2	3.8	70	197	1	0
2/10/16	0.0001	29.1	0.0025	1.38	0							3/17/16	7.4	12.8	3				
2/17/16	0.13	26.6	10.5	4.22	0							3/23/16	7.56	11.9	3.4				
2/24/16	0.0001	13.4	49.8	2.48	0							4/4/16	7.28	14.9	1				
3/4/16	0.0001	40.5	29.1	3.31	0							4/14/16	6.88	3.3	4.2	79	190		0
3/9/16	0.323	30.5	31.1	1.13	0							4/21/16	7.82	20.3	1				
3/17/16	0.0001	2.71	8.52	0.3	0							4/28/16	8.26	15.9	1				
3/24/16	0.0001	3.27	6.67	1.37	0							5/5/16	7.89	1.8	1.6				
4/4/16	0.0001	15	0.0025	0.3	0							5/13/16	7.28	17.9	0		198		

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
4/14/16	0.0001	0.03	0.0025	0.3	0							5/19/16	6.95	17.8	1.4	23			
4/21/16	0.0001	2.24	0.0025	0.3	0							5/25/16	7.55	17.6	1.6				0.0000
4/28/16	0.0001	6.01	0.0025	0.3	0							6/8/16	7.95	24.5	1.4		73.8	<1.0	
5/5/16	0.0001	12	0.0025	1.91	0							6/16/16	6.92	17.2	1.2	46			
5/13/16	0.0001	22.3	0.0025	1.63	0							6/24/16	7.79	17.6	1				
5/19/16	0.0001	9.24	0.0025	1.88	0							6/30/16	7.28	15.8	1.6				0.0000
5/25/16	0.0001	46.7	0.0025	1.89	0							7/7/16	8.02	21.1	3		73.8		
6/8/16	0.0001	13.8	0.0025	1.6	0							7/13/16	7.33	20.2	1.4	130			
6/16/16	0.0001	5.16	0.0025	1.28	0							7/22/16	7.78	23.4	0				
6/24/16	0.0001	13.8	0.0025	1.02	0							7/28/16	8.2	22.6	1.6				0.0000
6/30/16	1	54.7	16.1	7.5	0							8/3/16	8.36	20.8	1.6				
7/7/16	1.26	31	16.2	15.3	0							8/11/16	8.06	20.6	0	17	175		
7/13/16	0.186	15.7	0.0025	2.2	0							8/17/16	7.86	23.9	1.4				0
7/22/16	0.134	7.69	0.0025	0.3	0							8/24/16	6.85	21.7	0			0	
7/28/16	0.0001	11.9	0.0025	1.31	0							9/8/16	6.75	18.4	0				
8/3/16	0.0001	10.2	0.0025	1.14	0							9/15/16	6.98	16.9	0		169		
8/11/16	0.0001	7.26	0.0025	1.3	0							9/22/16	6.85	15.1	0	240			
8/17/16	0.0001	23.6	0.0025	1.75	0							9/28/16	7.68	15	0				
8/24/16	0.0001	33.4	0.0025	1.7	0							10/7/16	7.27	11.9	1				
9/8/16	0.0001	20.4	0.0025	2.93	0							10/12/16	7.63	10.1	1.2	8	125		
9/15/16	0.0001	20.7	0.0025	1.46	0							10/20/16	7.38	12.1	1.6				
9/22/16	0.0001	12.6	0.0025	0.3	0							10/26/16	6.96	14.6	1.2				
9/28/16	0.0001	17.3	0.0025	0.3	0							11/2/16	7.31	13.5	1.2				
10/7/16	0.0001	4.18	0.0025	0.3	0							11/8/16	7.32	10.5	1.4	31	162		
10/12/16	0.0001	37.8	0.0025	2.55	0							11/16/16	6.62	10.7	1.8			0	14
10/20/16	0.0001	60.3	0.0025	2.56	0							11/23/16	7.37	10.4	2.2				
10/26/16	0.0001	53.2	0.0025	0.3	0							12/7/16	7.85	4	5				
11/2/16	0.0001	41	0.0025	0.3	0							12/16/16	7.1	6.8	3.4	33	176		
11/8/16	0.0001	72.7	5.85	1.87	0							12/21/16	7.02	11	1.2				
11/16/16	0.0001	87.4	5.05	1.56	0							12/29/16	7.09	12.1	1.6				
11/23/16	0.0001	60.1	0.0025	1.04	0							1/5/17	7.03	2.7	3.4				
11/28/16	0.0001	28.8	37.7	0.3	0							1/12/17	7.07	3.3	10.2	920			
11/29/16	0.8255	37.25	39.1	0.3	0							1/19/17	7.45	10.6	5.6		138		

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
11/30/16	0.55	32.98	48.2	2.155	0							1/26/17	7.44	4.2	1.4				
12/7/16	0.103	51	7.51	1.45	0							2/2/17	7.5	7.8	8				
12/16/16	0.0001	29.9	0.0025	0.3	0							2/9/17	7.35	4	0	33	121		0
12/21/16	0.0001	19.3	0.0025	0.3	0							2/16/17	7.3	5.9	0				
12/28/16	0.0001	10.9	0.0025	0.3	0							2/23/17	7.23	10.6	8			0	
12/29/16	0.105	11.6	0.0025	1.06	0							3/9/17	7.72	10.2	0				
1/5/17	0.0001	35.3	18.3	0.3	0							3/16/17	7.91	11.7	0	11	106		
1/9/17	0.0001	62.8	17.9	1.26	0							3/23/17	7.51	8.3	0				
1/12/17	0.163	120	29.4	3.54	0							3/31/17	7.8	10.5	6				
1/19/17	0.11	218	11	6.22	0							4/6/17	8.17	11.7	15				
1/20/17	0.0001	48.3	0.0025	0.3	0							4/13/17	7.29	10.3	0	13	163		
1/24/17	0.0001	50.2	0.0025	0.3	0							4/20/17	7.37	10.6	0				
1/25/17	4.2	46.2	8.83	1.69	0							4/27/17	7.52	12.1	0				
1/26/17	0.0001	3.6	0.0025	0.3	0							5/4/17	7.42	13.2	0				
1/30/17	0.0001	47.7	0.0025	1.26	0							5/11/17	7.31	15.4	0	13	33.9		0
1/31/17	0.0001	27.3	0.0025	0.3	0							5/18/17	7.47	11.4	0				
2/2/17	0.0001	79.2	10	0.3	0							5/25/17	7.51	15.6	0				
2/9/17	0.0001	9.41	0.0025	1.13	0							6/8/17	7.46	21.4	0				
2/16/17	0.0001	12	0.0025	1.59	0							6/13/17	7.52	16.1	0	13	194		
2/23/17	0.0001	36.2	5.9	3.12	0							6/22/17	7.45	17.2	0				
3/9/17	0.0001	14.9	0.0025	1.24	0							6/29/17	7.29	19.7	0				
3/16/17	0.0001	7.73	8.4	2.72	0.005							7/7/17	7.46	22.3	0				
3/23/17	0.0001	4.41	7.7	1.97	0							7/13/17	7.52	21.7	0				
3/31/17	0.26	6.71	14.5	4.46	0							7/20/17	7.54	23.6	0	13	180		
4/6/17	0.5	9.11	22.5	5.33	0							7/26/17	7.65	20.7	0				
4/13/17	0.0001	77.2	8.2	5.18	0							8/3/17	7.73	21.6	0				
4/20/17	0.0001	33.4	0.0025	1.32	0							8/10/17	7.58	20.9	0		188		
4/27/17	0.0001	5.73	11.4	0.3	0							8/24/17	7.76	19.6	0	8		0	0
5/4/17	0.0001	46.2	5.1	1.95	0							8/31/17	7.68	19.8	0				
5/11/17	0.0001	8.55	5.8	0.3	0							9/7/17	7.68	17.7	0				
5/18/17	0.0001	10.7	5.9	0.3	0							9/14/17	8.02	15.9	0		176		
5/25/17	0.0001	26.2	0.0025	1.52	0							9/21/17	7.63	9.9	0				
6/8/17	0.0001	12.8	7.2	1.41	0							9/28/17	7.27	11	0	4			
6/13/17	0.0001	13	0.0025	1.3	0														
6/22/17	0.0001	24	7.5	1.49	0														

001*	Cd	Pb	Zn	Cu	Hg	001	TSS	As	Sb	Ag	Mn	001	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)	Cr VI
6/29/17	0.0001	13.6	0.0025	1	0														
7/7/17	0.0001	20.6	0.0025	0.3	0														
7/13/17	0.0001	20.8	0.0025	0.3	0														
7/20/17	0.0001	33.6	0.0025	0.3	0														
7/26/17	0.0001	7.52	0.0025	0.3	0														
8/3/17	0.0001	15.5	0.0025	1.07	0														
8/10/17	0.0001	12.1	0.0025	1	0.0008														
8/24/17	0.0001	8.29	0.0025	0.3	0														
8/31/17	0.0001	4.11	0.0025	0.3	0.0004														
9/7/17	0.0001	3.21	0.0025	0.3	0														
9/14/17	0.0001	0.03	7.5	0.3	0.0069														
9/21/17	0.0001	11.6	0.0025	1.06	0														
9/28/17	0.0001	3.57	0.0025	0.3	0														
9/30/17	0.0001	0.03	0.0025	0.3	0.005														

* this data uses ½ the detection level for non-detects except for mercury where zero was used

B. Effluent Data - Outfall 002

002	Cu	Pb	Zn	Cd	Hg	002	As	Sb	Ag	Mn	002	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)
All values in ug/L unless otherwise noted.																	
1/4/13	80.5	37	13.6	0.168	0.0001	1/1/13	7	30	0.1	698	1/4/13	6.68	3.4	<1.00			na
1/10/13	46	14.9	9.63	0.0001		1/2/13	4	29	0.3	759	1/10/13	8.01	23.6	2.4		193	
1/18/13	98.9	21.3	9.55	0.0001	0.0001	2/1/13	7	30	0.1	698	1/18/13	7.2	21.2	<1.00	<2.0		
1/24/13	135	38.6	10.4	0.0001		2/2/13	4	29	0.3	759	1/24/13	7.05	6.9	2			
1/31/13	123	33.2	8.9	0.104		3/1/13	7	30	0.1	698	1/30/13	7.22	4	<1.00			
2/7/13	140	8.9	11	0.0001	0.0001	3/2/13	4	29	0.3	759	2/7/13	7.26	2.6	2			1
2/14/13	160	20	10	0.0001		4/1/13	7	30	0.1	698	2/14/13	7.63	2.5	1	<2.0	200	
2/22/13	140	9	2.6	0.0001	0.0001	4/2/13	4	29	0.3	759	2/22/13	7.78	5.6	8			
2/26/13	100	17	2.6	0.0001		11/1/13	7	30	0.1	698	2/26/13	7.83	4.8	1			
2/27/13	110	17	3.1	0.0001		11/2/13	4	29	0.3	759	2/27/13	8.35	4.4	3			
3/6/13	65	8.9	2.8	0.0001	0.0001	12/1/13	7	30	0.1	698	3/6/13	7.39	5.7	3			na
3/14/13	210	44	8.8	0.0001		12/2/13	4	29	0.3	759	3/14/13	7.07	7.9	8		180	
3/20/13	260	110	0.0025	0.0001	0.0001	1/1/14	7	30	0.1	698	3/20/13	7.81	8.2	19			
3/25/13	77.2	34.7	10.1	0.0001		1/2/14	4	29	0.3	759	3/27/13	7.79	6	6	<2.0		

002	Cu	Pb	Zn	Cd	Hg	002	As	Sb	Ag	Mn	002	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)
3/26/13	62.7	32.5	10.9	0.0001	0.0001	2/1/14	7	30	0.1	698	3/28/13	7.8	6.2	3			
3/27/13	91	29	9.3	0.0001		2/2/14	4	29	0.3	759	4/5/13	na	na	<1.0			na
3/28/13	72	30	0.0025	0.0001		3/1/14	7	30	0.1	698	4/10/13			1	<2.0	180	
3/29/13	58.1	30.4	11.8	0.0001		3/2/14	4	29	0.3	759	4/17/13			3			
3/30/13	55.4	30.7	13.1	0.0001		4/1/14	7	30	0.1	698	4/25/13			10			
3/31/13	50.1	27.7	11.5	0.0001		4/2/14	4	29	0.3	759	11/6/13	7.03	23.5	10			
4/5/13	45	19	0.0025	0.0001	0.0001	5/1/14	7	30	0.1	698	11/12/13	7.04	16.6	2	0	130	
4/9/13	45	23	7	0.0001		5/2/14	4	29	0.3	759	11/19/13	7.28	8.8	4			
4/10/13	74	23	0.0025	0.0001	0.0001	10/1/14	7	30	0.1	698	11/26/13	7.53	3.9	35			
4/17/13	88	33	0.0025	0.0001		10/2/14	4	29	0.3	759	12/2/13	7.64	5.3	17			1
4/25/13	140	72	0.0025	0.0001		11/1/14	7	30	0.1	698	12/11/13	7.47	5.5	1	0	130	
11/6/13	70	20	5.2	0.0001	0.0001	11/2/14	4	29	0.3	759	12/21/13	7.52	3.4	2			
11/12/13	34	4.5	9.2	0.0001		12/1/14	7	30	0.1	698	12/24/13	7.34	4.6	2			
11/19/13	23	2.8	15	0.0001	0.0001	12/2/14	4	29	0.3	759	1/1/14	8.91	18	1			
11/26/13	120	52	16	0.0001		1/1/15	7	30	0.1	698	1/8/14	6.91	4.2	2	0	190	
12/2/13	75	28	12	0.0001	0.0001	1/2/15	4	29	0.3	759	1/15/14	7.93	4	6			
12/11/13	53		13	0.0001		2/1/15	7	30	0.1	698	1/22/14	7.78	16.7	7			
12/20/13	50	15	13	0.0001	0.0001	2/2/15	4	29	0.3	759	1/30/14	7.54	2.61	2			
12/24/13	63	15	9.8	0.0001		3/1/15	7	30	0.1	698	2/5/14	8.01	5	1			
1/1/14	27	6.7	8.5	0.0001	0.0001	3/2/15	4	29	0.3	759	2/12/14	7.63	2.4	1	0	180	
1/8/14	25	8.4	7.8	0.0001		4/1/15	7	30	0.1	698	2/19/14	7.46	7.3	8			
1/15/14	69	17	14	0.0001	0.0001	4/2/15	4	29	0.3	759	2/27/14	7.58	5.3	3.2			
1/23/14	120	45	15	0.0001		5/1/15	7	30	0.1	698	3/5/14	7.55	5.2	3.51			
1/30/14	41	5.3	9	0.0001		5/2/15	4	29	0.3	759	3/13/14	7.6	4	7.8		72.2	
2/6/14	56		0.0025	0.0001	0.0001	6/1/15	7	30	0.1	698	3/18/14	6.93	10.7	3.8	0		
2/12/14	50	11	7.4	0.0001		6/2/15	4	29	0.3	759	3/26/14	7.48	9.4	8.2			
2/19/14	74	24	24	0.0001	0.0001	10/1/15	7	30	0.1	698	4/1/14	6.99	3.9	0			
2/27/14	168	26	17.9	0.0001		10/2/15	4	29	0.3	759	4/11/14	7.66	12.9	0	0	145	
3/5/14	256	60.2	21.8	0.11	0.0001	11/1/15	7	30	0.1	698	4/18/14	7.63	11.9	0			
3/13/14	83.3	28.7	22.5	0.28		11/2/15	4	29	0.3	759	4/26/14	7.68	9.4	1.1			
3/18/14	50.4	12.2	15.4	0.17	0.0001	12/1/15	7	30	0.1	698	5/1/14	7.65	21.4	3.4			<1.0
3/26/14	82	1.15	16.9	0.17		12/2/15	4	29	0.3	759	5/8/14	7.9	15.5	2.3		150	
4/1/14	24.7	13.8	8.25	0.0001	0.0001	1/1/16	7	30	0.1	698	5/15/14	7.86	23.3	0	0		
4/11/14	16.4	12.2	3.54	0.0001		1/2/16	4	29	0.3	759	5/23/14	7.36	26.8	1.5			
4/18/14	13.8	12.1	0.0025	0.0001	0.0001	2/1/16	7	30	0.1	698	6/4/14	7.65	21.4	0			

002	Cu	Pb	Zn	Cd	Hg	002	As	Sb	Ag	Mn	002	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)
4/24/14	17.1	10.3	0.0025	0.0001		2/2/16	4	29	0.3	759	6/13/14	7.9	15.5	0		0	
5/1/14	45.2	36.5	5.4	0.21	0.0001	3/1/16	7	30	0.1	698	6/18/14	7.86	23.3	0	0		
5/8/14	17.6	13.4	0.0025	0.12		3/2/16	4	29	0.3	759	6/25/14	7.36	26.8	0			
5/15/14	17.3	11.3	0.0025	0.1	0.0001	4/1/16	7	30	0.1	698	10/17/14	7.99	11	2.4	350	107	
5/23/14	32.5	21.5	0.0025	0.0001		4/2/16	4	29	0.3	759	10/23/14	7.9	11.2	4			
10/17/14	67.4	18.5	5.99	0.0001	0.0001	5/2/16	7	30	0.1	698	10/31/14	7.69	11	4.6			
10/23/14	10.7	30	8.76	0.0001		5/3/16	4	29	0.3	759	11/7/14	7.39	13.4	2.4			
10/31/14	77.9	29.6	12.6	0.0001		6/1/16	7	30	0.1	698	11/14/14	7.84	0.8	4			
11/7/14	63.5	33.8	17.8	0.0001	0.0001	6/2/16	4	29	0.3	759	11/18/14	6.68	4	3.4	0	107	
11/14/14	67	61.7	20.1	0.14		7/1/16	7	30	0.1	698	11/25/14	7.03	11.2	1.5			
11/18/14	41.2	3.6	17	0.0001	0.0001	7/2/16	4	29	0.3	759	12/5/14	7.45	5.2	2.8			
11/25/14	36.9	9.36	15.6	0.21		8/1/16	7	30	0.1	698	12/12/14	6.67	8.6	2.3	0	158	na
12/5/14	51.7	53.9	25.1	0.41	0.0001	8/2/16	4	29	0.3	759	12/19/14	6.83	8.2	1.1			
12/12/14	67.6	18.5	20.5	0.0001		9/1/16	7	30	0.1	698	12/24/14	7.66	9	3.5			
12/19/14	21.7	22.5	15.2	0.0001	0.0001	9/2/16	4	29	0.3	759	1/7/15	7.52	5.2	4.5			
12/24/14	44.8	6.11	18.9	0.0001		10/1/16	7	30	0.1	698	1/14/15	6.72	7.1	0	0	178	na
1/7/15	31	2.5	0.0025	0.0001	0.0001	10/2/16	4	29	0.3	759	1/21/15	7.29	6.3	4.5			
1/14/15	17.6	16.6	16	0.0001		1/1/17	7	30	0.1	698	1/28/15	7.8	4.8	2.4			
1/21/15	22.7	28.6	11.7	0.0001	0.0001	1/2/17	4	29	0.3	759	2/4/15	7.02	18.5	1			
1/28/15	22.7	28.6	83.1	1.17		2/1/17	7	30	0.1	698	2/11/15	6.9	14.5	0	2	146	1.41
2/4/15	12.2	13	5.86	0.23	0.0001	2/2/17	4	29	0.3	759	2/20/15	7.68	5.1	2.2			
2/11/15	12.4	19.4	9.9	0.0001		3/1/17	7	30	0.1	698	2/26/15	7.77	10.5	1.1			
2/20/15	10	20.1	0.0025	0.0001	0.0001	3/2/17	4	29	0.3	759	3/5/15	8.15	10.6	1.2			
2/26/15	11.3	17.7	5.41	0.0001		5/1/17	7	30	0.1	698	3/11/15			0	0	137	
3/5/15	7.58	19.6	0.0025	0.0001	0.0001	5/2/17	4	29	0.3	759	3/20/15	7.24	15.2	1.4			
3/20/15	4.43	9.68	0.0025	0.0001							3/26/15	8.8	9.2	2.8			
3/26/15	4.8	18.1	0.0025	0.0001	0.0001						4/1/15	8.9	9.5	4.53			
4/1/15	15.1	14.7	5.83	0.0001	0.0001						4/8/15	8.68	16.4	4.13	0	136	
4/8/15	13.5	1.89	7.78	0.0001							4/15/15	8.13	15.8	4.06			
4/15/15	9.74	7.14	0.0025	0.0001	0.0001						4/22/15	8.62	14.8	11			
4/22/15	13.5	10.2	0.0025	0.0001							5/28/15	7.56	25.3	15.5			
5/6/15			0.0025	0.0001	0.0001						6/2/15	6.91	18.6	6.57			
5/13/15			0.0025	0.0001							6/9/15	7.6	24.3	0	79	157	
5/20/15			0.0025	0.0001	0.0001						10/29/15	6.62	8.6	3.4	79	234	
5/28/15	17.3	19.9	0.0025	0.0001							11/6/15	7.26	6	1.6			<1.0

002	Cu	Pb	Zn	Cd	Hg	002	As	Sb	Ag	Mn	002	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)
6/2/15	16	20.9	0.0025	0.0001	0.0001						11/12/15	7.89	9	4	196		
6/9/15	9.63	13.6	0.0025	0.104							11/18/15	7.39	11.6	1.4			
6/13/15			0.0025	0.0001	0.0001						11/25/15	7.22	7.2	0			
6/20/15			0.0025	0.0001							12/3/15	7.01	5.3	0			<1.0
6/28/15			0.0025	0.0001							12/9/15	7.52	6.2	2		157	
10/29/15	38.7	11.5	18.1	0.0001	0.0001						12/18/15	7.73	2.3	0	2		
11/6/15	14.1	19.9	0.0025	0.0001	0.0001						12/22/15	6.73	4.5	0			
11/12/15	9.83	26.9	0.0025	0.0001							1/7/16	6.85	5.1	0			<1.0
11/18/15	6.1	16.5	0.0025	0.0001	0.0001						1/14/16	7.34	5.1	0		187	
11/25/15	6.57	2.33	0.0025	0.0001							1/21/16	6.97	9.5	0	2		
12/3/15	4.13	11.5	0.0025	0.0001	0.0001						1/26/16	6.8	4.3	0			
12/9/15	5.34	23.1	0.0025	0.0001							2/4/16	6.86	2.6	2			6.02
12/18/15	5.12	19.3	0.0025	0.0001	0.0001						2/10/16	6.73	4.4	4.67		168	
12/22/15	2.96	15.2	0.0025	0.0001							2/17/16	7.19	6	2	0		
1/7/16	3.04	8.36	0.0025	0.0001	0.0001						2/24/16	8.01	8.3	4.6			
1/14/16	7.35	29.9	5.45	0.0001							3/4/16	7.17	12.4	3.2			6.02
1/21/16	15.4	33.4	20	0.27	0.0001						3/9/16	8.04	8.5	2.4		172	
1/26/16	18.9	28.6	18.9	0.207							3/17/16	7.19	8.6	1.6	0		
2/4/16	11.1	21.5	10.6	0.0001	0.0001						3/23/16	7.75	7.7	1.4			
2/10/16	21.6	38.4	5.23	0.235							4/4/16	8.18	18.2	2			
2/17/16	35.5	47	5.37	0.128	0.0001						4/14/16	8.51	11.4	2.6		175	
2/24/16	13.4	21.6	5.67	0.0001							4/21/16	8.74	24.6	4	0		
3/4/16	13.8	79.4	7.68	0.0001	0.0001						4/28/16	8.9	16.3	4.4			
3/9/16	7.59	30.1	6.72	0.115							5/5/16	8.06	24.5	4.6			
3/17/16	35.5	12.7	5.37	0.128	0.0001						5/13/16	7.16	15.7	2.4		195	
3/24/16	6.25	3.85	0.0025	0.0001							5/19/16	7.3	18.9	2	130		
4/4/16	4.92	42	0.0025	0.0001	0.0001						5/25/16	7.83	18.8	4.8			
4/14/16	4.24	30.9	0.0025	0.0001							6/24/16	7.18	18.1	3.4			
4/21/16	5.73	36.5	0.0025	0.0001	0.0001						6/30/16	7.93	16.5	4.4			
4/28/16	5.35	37.3	0.0025	0.0001							7/7/16	8.12	24.8	2.4			
5/5/16	4.98	33.4	0.0025	0.0001	0.0001						8/11/16	8.33	27.1	3.2	94	185	
5/13/16	4.57	30	0.0025	0.0001							8/17/16	7.57	26.2	<1.0			0
5/19/16	6.49	14.6	0.0025	0.0001	0.0001						9/8/16	6.25	17.25	1.4			
5/25/16	8.14	45.9	0.0025	0.0001							9/15/16	6.67	19.2	1		200	
6/24/16	11.7	1.03	0.0025	0.0001							9/22/16	6.47	14.7	1.2	23		

002	Cu	Pb	Zn	Cd	Hg	002	As	Sb	Ag	Mn	002	pH (su)	Temp (°C)	TSS (mg/l)	E. coli (#/100 ml)	Hardness (mg/l)	WET (TUc)
6/30/16	11	16.1	0.0025	0.132	0.0001						9/28/16	6.81	18.5	1			
7/7/16	10.7	6.42	0.0025	0.0001	0.0001						10/7/16	7.44	10.4	1.6			
8/11/16	8.66	4.67	0.0025	0.0001	0.0001						10/12/16	7.45	10.1	7	70	203	
8/17/16	9.26	7.03	0.0025	0.0001	0.0001						10/20/16	7.96	8.3	7.2			
9/8/16	12.5	6.61	0.0025	0.0001	0.0001						10/26/16	6.91		6.8			
9/15/16	9.83	37.6	0.0025	0.0001							1/5/17	6.91	0.7	2			
9/22/16	9.3	10.1	0.0025	0.0001	0.0001						1/12/17	7.3	1.1	2.8	14	202	
9/28/16	9.11	17.1	0.0025	0.0001							1/19/17	7.4	2.7	2.4			
10/7/16	8.47	21.5	0.0025	0.0001	0.0001						1/26/17	7.25	3.4	1.4			
10/12/16	16.8	75.3	0.0025	0.0001							2/2/17	7.57	10.2	39			
10/20/16	10.4	87.2	0.0025	0.0001	0.0001						2/9/17	7.45	6.3	0	2	178	
10/26/16	6.02	37.2	0.0025	0.0001							2/16/17	7.35	4	0			
1/5/17	13.3	25.5	0.0025	0.0001	0.0001						2/23/17	7.3	5.9	0			4.93
1/12/17	8.4	37	16.2	0.377							3/9/17	7.62	4.3	0			
1/19/17	21.5	115	16.5	0.348	0.0001						3/16/17	8	4	6	2	112	
1/26/17	8.03	23.8	6.22	0.0001							3/23/17	7.51	8.3	0			
1/31/17	5.4	13.9	0.0025	0.0001							3/31/17	8.4	6.4	0			
2/2/17	18.3	237	20	0.0001	0.0001						5/4/17	8.41	16.1	0			
2/9/17	6.51	15.8	0.0025	0.0001							5/11/17	8.06	21.9	0	8	196	
2/16/17	6.52	14.6	5.7	0.0001	0.0001						5/18/17	8.31	11.3	0			
2/23/17	12.6	44.8	181	0.67							5/25/17	7.82	18.6	0			
3/9/17	7.67	16.4	12.3	0.0001	0.0001												
3/16/17	26.9	7.5	10.2	0.82													
3/23/17	1.27	40	221	0.65	0.0001												
3/31/17	5.92	24.5	26.4	0.26													
5/4/17	6.03	9.92	5.9	0.0001	0.0001												
5/11/17	5.26	7.51	0.0025	0.0001													
5/18/17	3.44	2.47	0.0025	0.0001	0.0001												
5/25/17	6.32	6.69	0.0025	0.0001													

* this data uses ½ the detection level for non-detects

C. Lake Creek Data above Outfall 001

Lake Creek Data	Cadmium	Copper	Lead	Mercury	Zinc	pH (su)	Temperature (°C)	Upstream Hardness (mg/L)
All values are in ug/L unless otherwise noted								
February-12	0.05	0.5	5.19	0.05	18.1	7.28	4.1	131
May-12	0.274	0.5	0.5	0.05	15.6	7.22	7.5	22.6
August-12	0.05	0.5	2.47	0.05	6.34	7.25	14.8	129
November-12	0.21	1.7	1.76	0.05	2.5	7.4	6.6	113
February-13	0.05	0.5	2.5	0.0005	11	7.79	3.4	131
May-13	0.05	0.5	2.5	0.0005	4.9	6.35	7	22.6
August-13	0.05	0.5	2.5	0.0005	14	8.11	15	129
November-13	0.05	0.5	2.5	0.0005	14	7.7	6.1	100
February-14	0.05	0.5	2.5	0.0005	15	7.92	5	99
May-14	0.05	0.5	2.5	0.0005	4.9	6.46	6.9	26.2
August-14	1.13	0.5	2.5	0.0005	11.8	7	12.9	64.4
November-14	0.05	0.5	0.25	0.0005	14	7.7	6.1	100
February-15	0.05	0.5	2.5	0.0005	8.5	8.02	4.1	49.4
May-15	0.05	4	3.42	0.0005	10.7	7.63	10.1	57.4
August-15	0.05	0.5	2.5	0.0005	2.5	7.41	13.4	141
November-15	0.05	1.18	6.92	0.0005	13.7	7.83	2.5	141
February-16	0.05	0.5	0.5	0.0005	10.6	7.22	4	81.6
May-16	0.05	1.01	0.5	0.0005	9.05	8	10.5	46
August-16	0.05	0.5	0.5	0.006	8.55	7.75	11.9	133
November-16	0.05	0.5	1.4	0.0005	7.78	6.19	5.8	44.6

½ the detection level was used for any values reported as non-detect
When all values were below the detection level, zero was used for background (mercury)

D. SFCdA River Data above Outfall 002

SFCdA River Data	Cadmium	Copper	Lead	Mercury	Zinc	pH (su)	Temperature (°C)	Upstream Hardness (mg/L)
All values in ug/L unless otherwise noted								
February-12	5.09	0.5	5.89	0.05	706	7.26	3.6	69.8
May-12	1.83	0.5	2.84	0.05	217	6.81	4.7	24.3
August-12	4.07	0.5	5.93	0.05	406	7.38	18.5	66.8
November-12	4.9	1	2.4	0.05	510	8.1	4.9	126
February-13	5.2	0.5	2.5	0.0005	770	7.7	2.5	67.4
May-13	2.83	0.5	2.5	0.0005	217	6.35	5.7	33.4
August-13	4.55	0.5	2.5	0.0005	406	7.52	18.4	67
November-13	5.1	0.5	2.5	0.0005	760	7.62	5.5	110
February-14	4.7	0.5	2.5	0.0005	810	7.54	5.2	64
May-14	1.76	0.5	2.5	0.0005	225	6.35	5.7	33.4
August-14	4.41	1.33	6.34	0.0005	556	7.77	14.7	67
November-14	5.1	0.5	2.5	0.0005	760	7.62	5.5	99
February-15	3.56	0.5	6	0.0005	772	7.17	4.3	51.7
May-15	2.97	0.5	10.9	0.0005	381	7.56	13	40.7

SFCdA River Data	Cadmium	Copper	Lead	Mercury	Zinc	pH (su)	Temperature (°C)	Upstream Hardness (mg/L)
August-15	6.77	2.71	4.39	0.0005	1103	6.86	13.3	80.9
November-15	5.15	1.1	5.09	0.0005	839	7.85	0.9	103
February-16	5.6	0.5	0.5	0.0005	829	6.61	2.5	88.3
May-16	1.96	0.5	1.79	0.0005	274	7.62	12.8	38.6
August-16	5.41	0.5	1.18	0.0005	699	7.49	15.1	70.4
November-16	3.59	1.01	4.38	0.0005	506	8.08	6	103
½ the detection level was used for any values reported as non-detect When all values were below the detection level, zero was used for background (mercury)								

E. Effluent Violations

Outfall 001			
Cadmium	.0345	lb/d	01/31/2017
Cadmium	4.2	ug/L	01/31/2017
Copper	.1547	lb/d	07/31/2012
Copper	.3547	lb/d	04/30/2013
Copper	15.8	ug/L	07/31/2012
Copper	16	ug/L	04/30/2013
Lead	.8558	lb/d	11/30/2016
Lead	2.1347	lb/d	01/31/2017
Lead	60.3	ug/L	10/31/2016
Lead	87.4	ug/L	11/30/2016
Lead	218	ug/L	01/31/2017
Lead	79.2	ug/L	02/28/2017
Lead	77.2	ug/L	04/30/2017
Mercury	.027	ug/L	01/31/2013
Mercury	<.1	ug/L	02/28/2013
Mercury	<.1	ug/L	03/31/2013
Mercury	<.1	ug/L	04/30/2013
Mercury	<.1	ug/L	05/31/2013
Mercury	<.1	ug/L	06/30/2013
Outfall 002			
Cadmium	.0221	lb/d	03/31/2017
Copper	135	ug/L	01/31/2013
Copper	160	ug/L	02/28/2013
Copper	260	ug/L	03/31/2013
Copper	168	ug/L	02/28/2014
Lead	110	ug/L	03/31/2013
Lead	115	ug/L	01/31/2017
Lead	237	ug/L	02/28/2017
Total Suspended Solids	39	mg/L	02/28/2017
All violations are of Maximum Daily Limitations			

Appendix C.Reasonable Potential and WQBELs

A. Reasonable Potential Analysis

The EPA uses the process described in the TSD to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit.

Table C-1: Applicable Water Quality Standards

	Hardness =		116.2		76.5						
		Water Quality						Technology			
Parameter	Units	Aquatic Life 001		Aquatic Life 002		Human Health		TBEL 001		TBEL 002	
		Chronic	Acute	Chronic	Acute	Water & Org	Org Only	Average	Maximum	Average	Maximum
Cadmium	ug/L	1.3	2.5	0.8	1.6			50	100	50	100
Lead	ug/L	32.6	285.5	22.0	192.7			300	600	300	600
Zinc	ug/L	215.6	215.6	163.5	163.5	N/A	26000.0	750	1500	500	1000
Copper	ug/L	13.4	20.4	9.0	13.2			150	300	150	300
Mercury	ug/L	0.012	2.1	0.012	2.1			2	1	2	1
Arsenic	ug/L	150.0	340.0	150.0	340.0	N/A	6.2				
Antimony	ug/L					N/A	640.0				
Silver	ug/L		5.253		2.56						
Manganese	ug/L										
Chromium VI	mg/L	11.0	16.0	11.0	16.0						
TSS	mg/L							20	30	20	30
pH	s.u.	within 6.5 to 9.0		within 6.5 to 9.0				within 6.0 to 9.0		within 6.0 to 9.0	
E. coli	#/100ml	126.0	576.0	126.0	576.0						
Temperature	°C	19.0	22.0	19.0	22.0						
Copper - BLM	ug/L	0.6	1.0	0.6	1.0						

The metals criteria presented in Table C-1 are in total recoverable. Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limitations be expressed as total recoverable metal. Therefore, the EPA calculated total recoverable metal criteria that are protective of the dissolved criterion. This is accomplished by dividing the criterion expressed as dissolved by the criterion translator. The criteria translators (CT) are equal to the conversion factors because site-specific translators are not available for this discharge.

The hardnesses utilized in Table C-1 are those of a design discharge (7Q10) condition for demonstration purposes. The hardness used to determine effluent limitations in different flow scenarios is discussed below.

Hardness

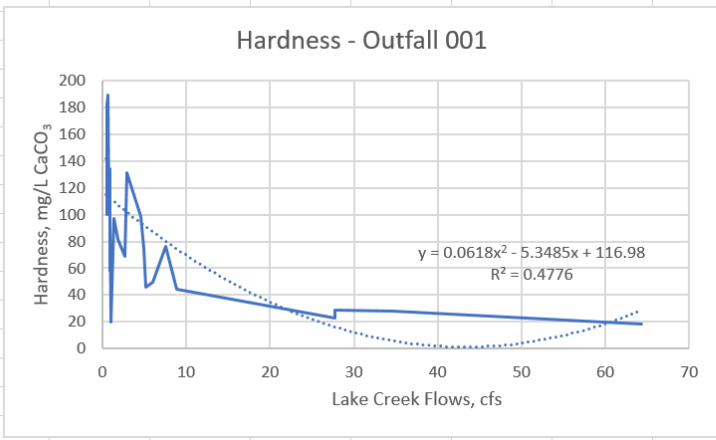
The WQS at IDAPA 58.01.02.210.03(c)(ii) state:

> The hardness values used for calculating aquatic life criteria for metals at design discharge conditions shall be representative of the ambient hardnesses for a receiving water that occur at the design discharge conditions given in Subsection 210.03.b.

This requirement has been interpreted as applying the hardness at the design discharge conditions to a criterion (1Q10 for an acute criterion and the 7Q10 for the chronic) to calculate an end-of-pipe criterion and applying a mixed hardness to calculate a criterion for a parameter with an authorized mixing zone. In a mixed hardess scenario, the equations expressed in the following figures were used to determine the upstream hardness at the various tier levels and incorporated into the mass balance equation to calculate the mixed hardness:

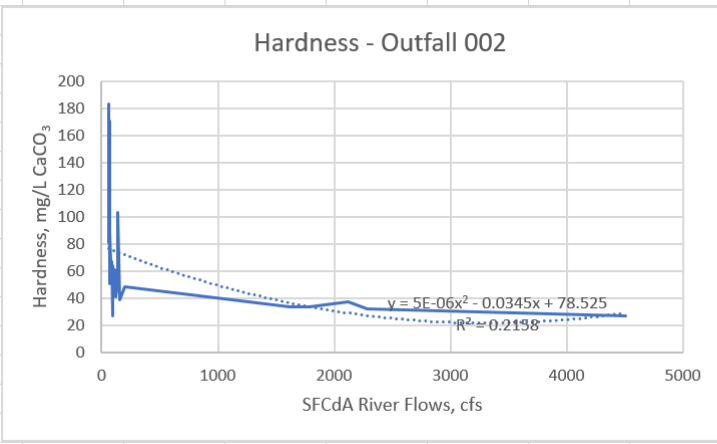
$$H_d = (QuHu + QeHe)/Qd \qquad \textit{Equation 1}$$

Where: H_d = mixed hardness downstream
Qu = upstream flow (design or flow tier)
Hu = upstream hardness (calculated with the equation)
Qe = 99th percentile of the effluent flow
He = 5th percentile of the effluent hardness
Qd = downstream flow = Qu+Qe



Design Flow	CFS	Hardness
1Q10	0.15	116.2
7Q10	0.15	116.2
10th percentile	0.51	114.3
50th percentile	1.9	107.0
70th percentile	5.99	87.2
90th percentile	21.3	31.1

Figure 1: Instream Hardness above Outfall 001



Design Flow	CFS	Hardness
1Q10	59	76.5
7Q10	60.4	76.4
10th percentile	63	76.4
50th percentile	87	75.5
70th percentile	135	73.9
90th percentile	1135	39.4

Figure 2: Instream Hardness above Outfall 002

Mass Balance

For discharges to flowing water bodies, the maximum projected receiving water concentration is determined using the following mass balance equation:

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \textit{Equation 2}$$

where,

C_d	=	Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
C_e	=	Maximum projected effluent concentration
C_u	=	95th percentile measured receiving water upstream concentration
Q_d	=	Receiving water flow rate downstream of the effluent discharge = Q_e+Q_u
Q_e	=	Effluent flow rate (set equal to the design flow of the WWTP)
Q_u	=	Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30Q5

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times Q_u}{Q_e + Q_u} \qquad \textit{Equation 3}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with 100% of the receiving stream.

If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times (Q_u \times \%MZ)}{Q_e + (Q_u \times \%MZ)} \qquad \textit{Equation 4}$$

Where:

% MZ = the percentage of the receiving water flow available for mixing.

If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

$$C_d = C_e \qquad \textit{Equation 5}$$

A dilution factor (D) can be introduced to describe the allowable mixing. Where the dilution factor is expressed as:

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e} \qquad \textit{Equation 6}$$

After the dilution factor simplification, the mass balance equation becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \textit{Equation 7}$$

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is a conversion factor used to convert between dissolved and total recoverable metal.

The above equations for C_d are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's TSD recommends using the maximum projected effluent concentration (C_e) in the mass balance calculation (see Equation 4). To determine C_e the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the C_e can be calculated using the following equations:

First, the percentile represented by the highest reported concentration is calculated.

$$p_n = (1 - \text{confidence level})^{1/n} \qquad \textit{Equation 8}$$

where,

p_n = the percentile represented by the highest reported concentration
n = the number of samples
confidence level = 99% = 0.99

and

$$\text{RPM} = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}} \qquad \textit{Equation 9}$$

where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile)
Z_{Pn} = z-score for the P_n percentile (inverse of the normal cumulative distribution function at a given percentile)
CV = coefficient of variation (standard deviation ÷ mean)

C_e is determined by simply multiplying the maximum reported effluent concentration by the RPM:

$$C_e = (\text{RPM})(\text{MRC}) \qquad \textit{Equation 10}$$

where MRC = Maximum Reported Concentration

Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

Once the C_e is calculated, the maximum projected effluent concentration at the edge of the acute and chronic mixing zones as well as addition flow tiers is calculated using the mass balance equations presented previously.

Reasonable Potential

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant.

Table C-2: Reasonable Potential Outfall 001									Edge of MZ				RP?	Location of Comparison
	Parameter	Units	N	CV	Pn	RPM	Max Eff	MEC	Chronic	Acute	HH - nc	HH - c		
	Cadmium - EOP	ug/L	252	0.21	0.982	1.050	4	4.41					Yes	End of Pipe
	Cadmium - TBEL							50.00					Yes	End of Pipe
	Lead - EOP	ug/L	252	0.93	0.982	1.201	218	261.89					Yes	End of Pipe
	Lead - TBEL							300.00					Yes	End of Pipe
	Zinc - EOP	ug/L	252	0.43	0.982	1.100	65	71.50					No	End of Pipe
	Zinc - TBEL							750.00					Yes	End of Pipe
Hardness-based	Copper - EOP	ug/L	252	1.42	0.982	1.276	18	22.96					Yes	End of Pipe
	Copper - TBEL							150.00					Yes	End of Pipe
	Copper-1							22.96	22.17	22.17			Yes	25% of 7Q10 and 1Q10
	Copper-2							22.96	20.50	20.50			Yes	25% of 10th percentile flow
	Copper-3							22.96	15.96	15.96			Yes	25% of 50th percentile flow
	Copper-4							22.96	9.93	9.93			No	25% of 70th percentile flow
	Copper-5							22.96	4.67	4.67			No	25% of 90th percentile flow
	Mercury - EOP	ug/L	252	0.60	0.982	1.137	0.007	0.008					No	End of Pipe
	Mercury - TBEL							1.0					Yes	End of Pipe
	Mercury-1							0.012	0.01	0.01			No	25% of 7Q10 and 1Q10
	Mercury-2							0.012	0.01	0.01			No	25% of 10th percentile flow
	Mercury-3							0.012	0.01	0.01			No	25% of 50th percentile flow
	Mercury-4							0.012	0.00	0.00			No	25% of 70th percentile flow
	Mercury-5							0.012	0.00	0.00			No	25% of 90th percentile flow
	Arsenic	ug/L	108	0.27	0.958	1.174	7	8.22					Yes	End of Pipe
	Arsenic-1							8.22	7.92	7.92		6.42	Yes	Use 25% of the harmonic mean: No upstream data - used zero
	Arsenic-2							8.22				---	---	Harmonic mean is greater than the Tier 2 10th percentile flow
	Arsenic-3							8.22				5.57	No	25% of 50th percentile flow
	Arsenic-4							8.22				3.29	No	25% of 70th percentile flow
	Arsenic-5							8.22				1.30	No	25% of 90th percentile flow
	Antimony	ug/L	108	0.02	0.958	1.010	30	30.31					No	End of Pipe
	Antimony-1							30.31			27.51		No	Use 25% of the 30Q5: No upstream data - used zero
	Antimony-2							30.31			26.88		No	25% of 10th percentile flow
	Antimony-3							30.31			20.55		No	25% of 50th percentile flow
	Antimony-4							30.31			12.13		No	25% of 70th percentile flow
	Antimony-5							30.31			4.79		No	25% of 90th percentile flow
	Silver	ug/L	108	0.50	0.958	1.326	0.30	0.40	End of pipe MEC less than the criterion				No	No upstream data - used zero
	Manganese	ug/L	108	0.04	0.958	1.025	759	778.23	No criteria for Mn				No	
	E. coli	#/100mL	56	2.27	0.921	1.000	920	920.00	End of pipe MEC exceeds the criteria				Yes	No mixing zone
BLM	Copper - EOP	ug/L	252	1.42	0.982	1.276	18	22.96					Yes	End of Pipe
	Copper - TBEL							150.00					Yes	End of Pipe

Table C-3: Reasonable Potential Outfall 002									Edge of MZ				RP?	Location of Comparison
	Parameter	Units	N	CV	Pn	RPM	Max Eff	MEC	Chronic	Acute	HH - nc	HH - c		
	Cadmium - EOP	ug/L	148	0.35	0.969	1.166	1.17	1.36					Yes	End of Pipe
	Cadmium - TBEL							50.00					Yes	End of Pipe
	Lead - EOP	ug/L	140	0.98	0.968	1.479	237	350.54					Yes	End of Pipe
	Lead - TBEL							300.00					Yes	End of Pipe
	Zinc - EOP	ug/L	148	0.39	0.969	1.186	221	262.10					Yes	End of Pipe
	Zinc - TBEL							500.00					Yes	End of Pipe
Hardness-based	Copper - EOP	ug/L	142	1.19	0.968	1.558	260.00	405.03					Yes	End of Pipe
	Copper - TBEL							150.00					Yes	End of Pipe
	Copper-1							405.03	26.20	26.77			Yes	25% of 7Q10 and 1Q10
	Copper-2							405.03	25.24	25.24			Yes	25% of 10th percentile flow
	Copper-3							405.03	18.88	18.88			Yes	25% of 50th percentile flow
	Copper-4							405.03	12.75	12.75			Yes	25% of 70th percentile flow
	Copper-5							405.03	2.54	2.54			No	25% of 90th percentile flow
	Mercury - EOP	ug/L	71	0.60	0.937	1.553	0.00010	0.00016					No	End of Pipe
	Mercury - TBEL							1.0					Yes	End of Pipe
	Mercury-1							0.00016	0.000010	0.000010			No	25% of 7Q10 and 1Q10
	Mercury-2							0.00016	0.000009	0.000009			No	25% of 10th percentile flow
	Mercury-3							0.00016	0.000007	0.000007			No	25% of 50th percentile flow
	Mercury-4							0.00016	0.000004	0.000004			No	25% of 70th percentile flow
	Mercury-5							0.00016	0.000001	0.000001			No	25% of 90th percentile flow
	Arsenic	ug/L	74	0.27	0.940	1.232	7	8.62					Yes	End of Pipe
	Arsenic-1							8.62	0.54	0.55		0.0061	No	Use 25% of the harmonic mean: No upstream data - used zero
	Arsenic-2							8.62				---	---	Harmonic mean is greater than the Tier 2 10th percentile flow
	Arsenic-3							8.62				0.38	No	25% of 50th percentile flow
	Arsenic-4							8.62				0.25	No	25% of 70th percentile flow
	Arsenic-5							8.62				0.03	No	25% of 90th percentile flow
	Antimony	ug/L	74	0.02	0.940	1.013	30	30.40					No	End of Pipe
	Antimony-1							30.40			1.16		No	Use 25% of the 30Q5 - No upstream data - used zero
	Antimony-2							30.40			1.81		No	25% of 10th percentile flow
	Antimony-3							30.40			1.34		No	25% of 50th percentile flow
	Antimony-4							30.40			0.87		No	25% of 70th percentile flow
	Antimony-5							30.40			0.11		No	25% of 90th percentile flow
	Silver	ug/L	74	0.50	0.940	1.445	0.30	0.43	End of pipe MEC less than the criterion				No	No upstream data - used zero
	Manganese	ug/L	74	0.04	0.940	1.033	759	784.16	No criteria for Mn				No	
	E. coli	#/100mL	31	2.75	0.862	6.130	350	2145.55	End of pipe MEC exceeds the criteria				Yes	No mixing zone
BLM	Copper - EOP	ug/L	252	1.42	0.982	1.276	18	22.96					Yes	End of Pipe
	Copper - TBEL							150.00					Yes	End of Pipe

Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis. To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation 6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \textit{Equation 11}$$

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from the EPA's TSD:

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)}$$ *Equation 12*

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)}$$ *Equation 13*

where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile probability basis)
CV = coefficient of variation (standard deviation ÷ mean)
σ_4^2 = $\ln(CV^2/4 + 1)$

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit effluent limitations as shown below.

Derive the maximum daily and average monthly effluent limitations

Using the TSD equations, the MDL and AML effluent limitations are calculated as follows:

$$\mathrm{MDL} = \mathrm{LTA} \times e^{(z_m\sigma - 0.5\sigma^2)}$$ *Equation 14*

$$\mathrm{AML} = \mathrm{LTA} \times e^{(z_a\sigma_n - 0.5\sigma_n^2)}$$ *Equation 15*

where σ, and σ² are defined as they are for the LTA equations above, and,

σ_n^2 = $\ln(CV^2/n + 1)$
z_{95} = 1.645 (z-score for the 95th percentile probability basis)
z_{99} = 2.326 (z-score for the 99th percentile probability basis)
n = 4, the number of sampling events required per month.

to set effluent limitations for human health criteria such as arsenic, the AML is set equal to the WLA and the MDL is calculated as follows:

$$MDL = AML * e^{(z_m\sigma - 0.5\sigma^2)} / e^{(z_a\sigma_n - 0.5\sigma_n^2)}$$ *Equation 16*

Tables C-4 and C-5 show the values used to calculate the effluent limitations as well as the calculated concentration and loading limitations. The WQS and the CVs are shown in Tables C-1 and C-2. As discussed in the Anti-backsliding section, the effluent limitations for cadmium, lead, and zinc cannot increase over those in the previous permit because of the listed impairment for those parameters so the effluent limitations proposed in the draft permit are the more stringent of the 2007 or current calculated limitations. The levels for copper and mercury meet the antidegradation requirements so the increases are allowed. The effluent limitations proposed in the draft permit are shown in Tables C-6 and C-7.

Table C-4: 001 Calculated Effluent Limitations										Concentration			Loading	
	σ^2 =	σ =	σ^2_4 =	σ_4 =	WLAc	*WLAa*	*LTAc*	LTAa	LTAmin	AML	MDL	Hardness	AML	MDL
Cadmium	0.04	0.21	0.01	0.11	1.3	2.5	1.00	1.55	1.00	1.2	1.6	116.2	0.03	0.04
Lead	0.63	0.79	0.20	0.44	32.6	285.5	12.79	61.88	12.79	24.1	59.0	116.2	0.60	1.46
Zinc	0.17	0.41	0.05	0.21	215.6	215.6	134.50	90.04	90.04	124.9	215.6	116.2	3.09	5.33
Copper 1*	1.11	1.05	0.41	0.64	11.25	16.84	3.12	2.54	2.54	7.2	20.6		0.18	0.51
Copper 2	1.11	1.05	0.41	0.64	11.50	17.24	3.19	2.60	2.60	7.3	20.6	114.3	0.18	0.51
Copper 3	1.11	1.05	0.41	0.64	12.33	18.54	3.42	2.79	2.79	7.0	19.9	107.0	0.17	0.49
Copper 4	1.11	1.05	0.41	0.64	13.88	20.90	3.85	3.15	3.15	7.1	20.3	87.2	0.18	0.50
Copper 5	1.11	1.05	0.41	0.64	12.87	18.85	3.57	2.84	2.84	4.0	11.3	31.1	0.10	0.28
Copper (BLM)**	1.11	1.05	0.41	0.64	0.60	1.00	0.17	0.15	0.15	0.4	1.0		0.009	0.025
Mercury 1	0.31	0.55	0.09	0.29	0.01	2.12	0.006	0.68	0.006	0.010	0.020	---	0.0003	0.0005
Mercury 2	0.31	0.55	0.09	0.29	0.01	2.16	0.007	0.69	0.007	0.010	0.020	---	0.0003	0.0005
Mercury 3	0.31	0.55	0.09	0.29	0.01	2.32	0.007	0.74	0.007	0.011	0.022	---	0.0003	0.0005
Mercury 4	0.31	0.55	0.09	0.29	0.02	2.79	0.008	0.89	0.008	0.013	0.026	---	0.0003	0.0007
Mercury 5	0.31	0.55	0.09	0.29	0.03	4.54	0.014	1.46	0.014	0.021	0.043	---	0.0005	0.0011
Arsenic 1	0.31	0.55	0.09	0.29						6.6	13.2	---	0.16	0.33
Arsenic 2										6.6	13.2	---	0.16	0.33
E. coli										126.0	576.0	---		
TSS										20	30	---	Annual Average must not exceed 202 lbs/day	

* The permit effluent limitations for copper will be based on the standard that is in effect at the time the permit is issued.
** The background concentration of copper is higher than the BLM criteria so no mixing zone can be authorized.

Table C-5: 002 Calculated Effluent Limitations										Concentration			Loading	
	σ^2 =	σ =	σ^2_4 =	σ_4 =	WLAc	WLAa	LTAc	LTAa	LTAmin	AML	MDL	Hardness	AML	MDL
Cadmium	0.11	0.34	0.03	0.17	0.85	1.58	0.57	0.76	0.57	0.8	1.3	76.5/76.4	0.01	0.01
Lead	0.67	0.82	0.21	0.46	21.99	192.74	8.36	40.21	8.36	16.0	40.0	76.5/76.4	0.16	0.41
Zinc	0.14	0.38	0.04	0.19	163.45	163.45	106.38	73.26	73.26	98.7	163.5	76.5/76.4	1.00	1.66
Copper 1*	0.88	0.94	0.30	0.55	73.29	109.40	23.74	19.17	19.17	42.0	112.8		0.426	1.144
Copper 2	0.88	0.94	0.30	0.55	76.60	116.75	24.81	20.45	20.45	44.5	119.5	76.40	0.451	1.212
Copper 3	0.88	0.94	0.30	0.55	100.74	153.58	32.63	26.91	26.91	58.7	157.9	75.50	0.596	1.601
Copper 4	0.88	0.94	0.30	0.55	147.42	224.71	47.75	39.37	39.37	86.4	232.3	73.90	0.877	2.356
Copper 5	0.88	0.94	0.30	0.55	611.18	909.42	197.96	159.32	159.32	150.0	300.0	39.40	1.522	3.043
Copper (BLM)**	0.88	0.94	0.30	0.55	0.60	1.00	0.194	0.175	0.175	0.4	1.0		0.004	0.010
Mercury 1	0.3075	0.5545	0.0862	0.2936	0.1083	18.5625	0.0571	5.9601	0.0571	0.089	0.178	---	0.001	0.002
Mercury 2	0.3075	0.5545	0.0862	0.2936	0.1124	19.6786	0.0593	6.3185	0.0593	0.092	0.185	---	0.001	0.002
Mercury 3	0.3075	0.5545	0.0862	0.2936	0.1507	26.3751	0.0795	8.4686	0.0795	0.123	0.248	---	0.001	0.003
Mercury 4	0.3075	0.5545	0.0862	0.2936	0.2272	39.7683	0.1199	12.7689	0.1199	0.186	0.373	---	0.002	0.004
Mercury 5	0.3075	0.5545	0.0862	0.2936	1.8217	318.7929	0.9608	102.3591	0.9608	1.0	2.0	---	0.010	0.020
E. coli										126.0	576.0	---		
TSS										20	30	---	Annual Average must not exceed 80 lbs/day	

Table C-6: Draft Permit Proposed Effluent Limitation – Outfall 001				
Parameter	Concentration ug/L		Loading lb/day	
	AML	MDL	AML	MDL
Cadmium	0.87	1.6	0.012	0.027
Lead	24.1	58	0.39	0.81
Zinc	87	195	1.2	2.7
Copper 1	7.2	20.6	0.18	0.51
Copper 2	7.3	20.6	0.18	0.51
Copper 3	7.0	19.9	0.17	0.49
Copper 4	7.1	20.3	0.18	0.50
Copper 5	4.0	11.3	0.1	0.28
Copper BLM	0.4	1.0	0.004	0.010
Mercury 1	0.010	0.020	0.0003	0.0005
Mercury 2	0.010	0.020	0.0003	0.0005
Mercury 3	0.011	0.022	0.0003	0.0005
Mercury 4	0.013	0.026	0.0003	0.0007
Mercury 5	0.021	0.043	0.0005	0.0011

Table C-7: Draft Permit Proposed Effluent Limitations – Outfall 002				
Parameter	Concentration ug/L		Loading lb/day	
	AML	MDL	AML	MDL
Cadmium	0.8	1.3	0.007	0.013
Lead	16.0	40.0	0.163	0.406
Zinc	85	163.5	0.63	1.66
Copper 1	42.0	112.8	0.426	1.144
Copper 2	44.5	119.5	0.451	1.212
Copper 3	58.7	157.9	0.596	1.601
Copper 4	86.4	232.3	0.877	2.356
Copper 5	150.0	300.0	1.522	3.043
Copper BLM	0.4	1.0	0.004	0.010
Mercury 1	0.0887	0.1780	0.00090	0.00181
Mercury 2	0.0921	0.1847	0.00093	0.00187
Mercury 3	0.1234	0.2476	0.00125	0.00251
Mercury 4	0.1861	0.3733	0.00189	0.00379
Mercury 5	1.0	2.0	0.01014	0.02029

Appendix D.CWA 401 State Certification

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

February 26, 2019

NPDES Permit Number(s): ID0000027 U.S. Silver Coeur Galena Mines

Receiving Waterbody: Lake Creek and South Fork Coeur d'Alene River

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended; 33 U.S.C. Section 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

Based upon our review of the above-referenced permit and associated fact sheet, DEQ certifies that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02), and other appropriate water quality requirements of state law.

This certification does not constitute authorization of the permitted activities by any other state or federal agency or private person or entity. This certification does not excuse the permit holder from the obligation to obtain any other necessary approvals, authorizations, or permits.

Antidegradation Review

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

- Tier I Protection. The first level of protection applies to all waterbodies subject to Clean Water Act jurisdiction and ensures that existing uses of a waterbody and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II Protection. The second level of protection applies to those waterbodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier III Protection. The third level of protection applies to waterbodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a waterbody by waterbody approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any waterbody not fully supporting its beneficial uses will be provided Tier I protection for that use, unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

The Galena Complex discharges the following pollutants of concern: copper, lead, zinc, cadmium, mercury, arsenic, antimony, pH, temperature, total suspended solids (TSS), *E. coli*, whole effluent toxicity, and chromium VI. Effluent limits have been developed for copper, lead, zinc, cadmium, mercury, arsenic, pH, TSS, *E. coli*, and whole effluent toxicity. No effluent limits are proposed for antimony, chromium VI, and temperature.

Discharge Information

U.S. Silver Corporation owns and operates the Galena and Coeur underground mines and mills (Galena Complex) for the production of copper, silver, and lead concentrates. The Galena Complex is approximately 1.5 miles south of Silverton located in the Lake Creek watershed. Three settling ponds located adjacent to Lake Creek receive industrial and domestic wastewater from the Galena mill, stormwater, and the Callahan adit water. These ponds discharge through Outfall 001 into Lake Creek.

Tailings from the Galena Complex along with mine drainage from the Rainbow adit (approximately 0.011cfs) are piped to the Osburn Tailings Ponds. The Osburn Tailings Ponds treatment system consists of one active pond and a decant pond located in the South Fork Coeur d'Alene River valley adjacent to the river at the eastern edge of the City of Osburn. This system discharges through Outfall 002 into the South Fork Coeur d'Alene River.

Flow Tier Effluent Limits

The NPDES permit allows for different discharge rates of pollutants from each Outfall based on the flows in the respective receiving waters as allowed by the WQS (IDAPA 58.01.02.400.05). Both Lake Creek and the South Fork Coeur d'Alene River have five flow tiers for two pollutants, mercury and copper. Lake Creek has two flow tiers identified for arsenic. The flow tiers allow limits to be calculated based on actual in-stream conditions for flow and hardness (the mercury standard is not based on hardness).

Changes from Previous Permit

This facility has increased its effluent flow from the previous permit cycle by 1.15 cfs for Outfall 001 (Lake Creek) and 0.61 cfs for Outfall 002 (South Fork Coeur d'Alene River). Previous effluent limits were calculated using effluent flows of 3.44 cfs for Outfall 001 and 1.27cfs for Outfall 002. Effluent limits for the new permit are based on effluent flows of 4.59 cfs for Outfall 001 and 1.88 cfs for Outfall 002.

Receiving waterbody flows also differ from those used to develop the 2007 permit. The 2007 in-stream critical flow for Lake Creek was estimated. This information is now replaced by actual in-stream monitoring from the last ten years of flow. Although not a complete dataset, it shows that critical flows in Lake Creek were overestimated in the 2007 permit. This means that limits in the new permit will be calculated using less dilution for the 001 discharge for those pollutants receiving a mixing zone. Conversely, the 2007 permit used flows for the South Fork Coeur d'Alene River that were lower than the current data set indicates. Therefore, the 002 discharge will have more dilution available for calculating effluent limits for the new permit for pollutants that have an authorized mixing zone.

The next variable that has changed since the 2007 permit is the coefficient of variation (CV). The EPA uses a statistical approach to better characterize the effects of effluent variability when calculating effluent limits. The approach uses a CV for each pollutant that reflects the uncertainty inherent in a limited data set. The less dispersion around the mean, the smaller the CV will be. This coefficient is used to calculate the maximum projected effluent concentration. As datasets change from permit cycle to permit cycle, the CVs change also.

The last variable affecting the new effluent limits is the method used to calculate the water quality criteria (standard) for hardness dependent metals. The previous permit used effluent hardness to calculate criteria. The WQS at IDAPA 58.01.02.210.03.c.ii require that ambient hardness of the receiving water be used to calculate criteria. Hardness data collected during the 2007 permit cycle provides the in-stream hardness data for the new permit. This probable error in the method used to calculate effluent limits is sufficient justification for a compliance schedule to allow the permittee time to develop treatment technologies to comply with their new limits. This error only affected effluent limitations for cadmium, lead, and zinc for Outfall 002. Using the correct hardness to calculate metals criteria for Outfall 001 increased effluent limits because Lake Creek is an effluent dominated stream during critical low flow timeframes. As a result there was no decrease in effluent limits for cadmium, lead, and zinc due to a change in hardness for Outfall 001.

DEQ has developed a new method for calculation of the copper criteria. To date, the method has not yet been approved by EPA for use in this permit. The new method is based on eleven different in-river water quality parameters and the collection of 24 consecutive monthly river samples to populate the model. Monitoring for these parameters has been added to the permit along with copper biotic ligand model (BLM) effluent limits that were developed using conservative estimates as a substitute for measured in-stream parameters. If EPA approves of the BLM method before this permit is final, a compliance schedule and interim limits will apply for a specified period of time to allow the permittee time to achieve compliance with the final copper BLM effluent limits. Copper BLM monitoring will be required regardless of EPA approval.

DEQ will analyze both the hardness-based and BLM based copper effluent limits in this certification and consider public comments on both sets of effluent limits. Prior to finalization of the permit, the method in effect for Clean Water Act purposes (the EPA approved method) will be selected and only those effluent limits will be used in the final limits. The copper BLM based effluent limits also have a compliance schedule to allow time to meet final effluent limits. DEQ anticipates EPA approval of the copper BLM prior to the issuance of the final permit however; a compliance schedule has been included in this certification for new hardness-based copper effluent limits in the event the BLM method is not approved before issuance of the final permit.

Copper limits for Outfall 001 were generally lower due to the authorization of a smaller mixing zone, less flow in the stream (in the previous permit flow was estimated), a different CV used in the statistical analysis to develop limits, and an increase in effluent flow from the last permit cycle. The 10 year compliance schedule for hardness-based copper, tracks with the copper BLM schedule with the exception of the first two years of data collection that is only necessary if the BLM method is approved before issuance of the final permit.

Site-specific aquatic life criteria have been developed for the South Fork Coeur d'Alene Subbasin for cadmium, lead, and zinc (IDAPA 58.01.02.284). These site-specific criteria were used to calculate effluent limits for cadmium, lead, and zinc and the assimilative capacity analyses for both Outfalls. The site-specific criteria were used to calculate limits in the 2007 permit also.

The mixing zone policy in the current WQS has not yet been approved by EPA. As noted in the current WQS (IDAPA 58.01.02.060), the mixing zone rules in the 2014 WQS are approved and must be used for all Clean Water Act purposes. However, the new mixing zone policy provisions, while not effective for CWA purposes, assist in DEQ's interpretation and application of the mixing zone provisions that have been approved by EPA.

Receiving Waterbody Level of Protection

The Galena Complex discharges to the Lake Creek and South Fork Coeur d'Alene River within the South Fork Coeur d'Alene Subbasin assessment unit (AU). The South Fork Coeur d'Alene River AU number is ID17010302PN001_03 (South Fork Coeur d'Alene River between Placer Creek and Big Creek). This AU has the following designated beneficial uses: cold water aquatic life, and secondary contact recreation. Salmonid spawning is an existing use as documented by DEQ's Beneficial Use Reconnaissance Monitoring in 2014 and in DEQ's *Summary of U.S. Silver Bioassessment Salmonids Data (2007-2018).* Temperature monitoring has been added to the permit for both Outfalls to assess compliance with this beneficial use. The Lake Creek AU is ID17010302PN009b_02 (Lake Creek from mining impact area to South Fork Coeur d'Alene River). This AU has the following designated beneficial uses: cold water aquatic life, salmonid spawning and secondary contact recreation. Salmonid spawning is an existing use in Lake Creek as documented by DEQ's Beneficial Use Reconnaissance Monitoring in 2014. In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100). The South Fork Coeur d'Alene subbasin that includes Lake Creek has site specific water quality criteria for cadmium, lead and zinc (IDAPA 58.01.02.284). EPA used these site-specific criteria to develop effluent limits for those metals.

According to DEQ's 2014 Integrated Report, both the South Fork Coeur d'Alene River and Lake Creek AUs are not fully supporting their aquatic life use. Causes of impairment for Lake Creek are unknown and the causes for the South Fork Coeur d'Alene River impairments include cadmium, lead, zinc, and sediment/siltation. As such, DEQ will provide Tier I protection (IDAPA 58.01.02.051.01) for the aquatic life uses in both waterbodies.

For both waterbodies, the secondary contact recreation beneficial use is unassessed. DEQ must provide an appropriate level of protection for the secondary contact recreation use using information available at this time (IDAPA 58.01.02.052.05.b). Based on *E. coli* data collected in

2017 by DEQ and instream metals monitoring (metals significant to human health IDAPA 58.01.02.210.01.b) conducted by the permittee, the recreational use for both Lake Creek and South Fork Coeur d'Alene River is determined to be fully supported for the purposes of this certification. DEQ will therefore provide Tier I and Tier II protection for the recreation use in both waterbodies.

Protection and Maintenance of Existing Uses (Tier I Protection)

A Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing and designated uses and the level of water quality necessary to protect existing and designated uses shall be maintained and protected. In order to protect and maintain existing and designated beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS which are set at levels that ensure protection of existing and designated beneficial uses. Other provisions of the WQS such as Section 055, addresses water quality limited waters.

In general, Section 055 prohibits further impairment of waters by point sources prior to development of a total maximum daily load (IDAPA 58.01.02.055.04). The South Fork Coeur d'Alene River is impaired due to excess cadmium, lead, and zinc. Lake Creek is a tributary to the South Fork Coeur d'Alene River and the Outfall 001 discharge is located approximately 0.3 miles upstream from the confluence. Any increase of metals from Outfall 001 is likely to reach the river for the following reasons: Lake Creek at critical flows is an effluent dominated stream so dilution is not available; metals are not pollutants that dissipate; nor are metals assimilated into other processes that render them less harmful; and, because Lake Creek is a steep gradient stream with a pronounced seasonal high flow, settling of particulate bound metals and retention in the stream is unlikely. Therefore, no mixing zone is allowed for cadmium, lead, and zinc in either Outfall 001 or Outfall 002.

During the 2007 permit cycle, the permittee increased their effluent flow to both outfalls. As discussed above, to prevent further degradation of an already impaired waterbody, the causative pollutants, cadmium, lead, and zinc cannot increase beyond the limits in the 2007 permit (IDAPA 58.01.02.052.07). Effluent limits for cadmium, lead, and zinc were retained from the previous permit for Outfall 001 since the in-stream hardness data did not lower the criteria for Lake Creek (an effluent dominated stream at low flow conditions). However, due to the in-stream hardness data collected during the 2007 permit cycle, the critical flow water quality criteria were lower in the South Fork Coeur d'Alene River than criteria used to calculate effluent limits in the 2007 permit. This lowered effluent limits for cadmium, lead, and zinc for Outfall 002. The result is that effluent limitations and associated requirements contained in the Galena Complex permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS.

Lake Creek and the South Fork Coeur d'Alene River have had yearly bioassessment monitoring conducted above and below the Coeur Galena Outfalls since 2007. Data collected will assist with future development of total maximum daily loads (TMDLs). DEQ has determined that an adequate amount of bioassessment data has been collected and there is no need for continuing this requirement in the proposed permit. Downstream monitoring for metals, pH, flow and hardness have been added to the permit requirements to ensure that WQS are being met downstream of each outfall. Other instream monitoring requirements have been added to the

proposed permit for use in determining copper effluent limits using the BLM. Once the BLM is approved by EPA for use in the Idaho WQS, future permits will require this method be used to calculate copper criteria for use in development of effluent limits for copper. Additional upstream temperature monitoring has been added to the permit for both outfalls. DEQ will use this data to assess compliance with temperature criteria.

Waterbodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a TMDL must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the waterbody to a condition that supports existing and designated beneficial uses. Currently, there has not been a comprehensive subbasin assessment and TMDLs developed for the South Fork Coeur d'Alene watershed for metal pollutants. Prior to the development of a TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect uses (IDAPA 58.01.02.055.04). The effluent limitations and associated requirements contained in the Galena Complex permit are set to not violate water quality standards below any applicable mixing zone.

The EPA-approved *South Fork Coeur d'Alene River Sediment Subbasin Assessment and Total Maximum Daily Load* (May 17, 2002) establishes wasteload allocations for outfalls 001 and 002 for sediment. These wasteload allocations (see effluent limits for TSS in Tables 3 and 4) are designed to ensure the South Fork Coeur d'Alene River will achieve the water quality necessary to support its existing and designated aquatic life beneficial uses and comply with the applicable numeric and narrative criteria. The effluent limitations and associated requirements contained in the Galena Complex permit are set at levels that comply with these wasteload allocations. All other effluent limits are set to not violate water quality standards below any applicable mixing zone.

In summary, the effluent limitations and associated requirements contained in the Galena Complex permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the wasteload allocations established in the *South Fork Coeur d'Alene River Sediment Subbasin Assessment and Total Maximum Daily Load*. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Lake Creek and South Fork Coeur d'Alene River in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

High-Quality Waters (Tier II Protection)

Lake Creek and South Fork Coeur d'Alene River are considered high quality for secondary contact recreational uses. As such, the water quality significant to secondary contact recreational uses of Lake Creek and South Fork Coeur d'Alene River must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is significant to secondary contact recreational uses of Lake Creek and South Fork Coeur d'Alene River (IDAPA 58.01.02.052.05). These include the following: antimony, arsenic, copper, cadmium, lead, mercury, zinc, chromium VI, and *E. coli*. Effluent limits are set in the proposed permit for all these pollutants except antimony and chromium VI.

For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license (IDAPA 58.01.02.052.06.a). For a new permit or license, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and the water quality that would result from the activity or discharge as proposed in the new permit or license (IDAPA 58.01.02.052.06.a).

Pollutants with Limits in the Current and Proposed Permit- Cadmium, Copper, Lead, Mercury, and Zinc

For pollutants significant to secondary contact recreation that are currently limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit or license (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). For the Galena Complex permit, this means determining the permit's effect on water quality based upon the limits for cadmium, copper, lead, mercury and zinc in the current and proposed permits. Tables 3 and 4 provide a summary of the current permit limits and the proposed or reissued permit limits. Due to an increase in effluent flow over the last permit cycle, DEQ conducted an assimilative capacity analysis to determine if the increase would result in significant degradation of water quality for purposes of secondary contact recreation in Lake Creek or the South Fork Coeur d'Alene River. Direct comparison of effluent limits between the current and proposed permits is complicated by several factors, including a reduced flow in Lake Creek, an increased flow in South Fork Coeur d'Alene River, different flow tiers between the permits, the use of receiving water hardness instead of effluent hardness, and changed coefficients of variation. However, for both outfalls, cadmium, lead, and zinc do not require assimilative capacity analysis because the discharge of those pollutants will not be allowed to increase under the proposed permit due to the existing water quality impairment of the South Fork Coeur d'Alene River. Therefore, there will be no degradation due to the discharge of cadmium, lead, and zinc under the proposed permit.

The discharge of copper and mercury is expected to increase at both outfalls. DEQ must therefore determine if the increase will result in significant degradation. Significant degradation occurs when the discharge of the pollutant will cumulatively decrease the remaining assimilative capacity by more than 10% percent or, if less than 10%, when determined by the Department to be significant (IDAPA 58.01.02.052.08.a). Generally, this analysis entails a comparison of the pollutant concentration in the discharge against the concentration in the receiving water relative to the applicable numeric water quality criterion for the pollutant under analysis. The Idaho WQS include numeric "fish only" criteria that are designed to be protective of recreational uses IDAPA 58.01.02.210.b. Copper and mercury; however, do not have numeric "fish only" criteria in the Idaho WQS. To conduct an assimilative capacity analysis, DEQ must therefore determine appropriate values to use in place of numeric criteria for copper and mercury.

DEQ has determined it is reasonable and appropriate to use the Safe Drinking Water Act maximum contaminant level goals (MCLGs) as the basis for evaluating the assimilative capacity of copper in both Lake Creek and the South Fork Coeur d'Alene River. MCLGs represent the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, allowing for an adequate margin of safety. They differ from the more commonly known Maximum Contaminant Levels (MCLs) because the

MCLGs do not take into consideration treatment limitations or other implementation factors that modify MCLs. MCLGs are always either equal to or more conservative than MCLs. By contrast, Idaho's secondary contact recreation use is intended to protect activities in and on the water where ingestion of raw water is unlikely to occur (IDAPA 58.01.02.100.02.b). Using MCLGs to evaluate pollutants significant to secondary contact recreation is thus a conservative and protective approach.

DEQ compared the MCLG for mercury with the 2004 Idaho WQS numeric "fish only" criteria for mercury. The 2004 WQS mercury criteria were removed from the rules not because they were flawed but rather Idaho DEQ was moving towards adopting fish tissue based criteria. After comparing the two criteria, we found that the 2004 WQS criterion was more protective than the MCLG and selected it for use in the mercury assimilative capacity analyses for both outfalls.

- **Assimilative Capacity Analysis for Copper and Mercury Outfall 001 (Lake Creek)**

Using the monitoring data from the 2007 permit cycle, DEQ can determine if the increase in effluent flow from Outfall 001 significantly degraded water quality. Table 1 contains the data used in the analysis. Negative values indicate an increase in assimilative capacity and positive values indicate a decrease. The assimilative capacity analyses for pollutants that did not result in water quality degradation are also presented in Table 1 to give the reader an understanding of the analysis. There are many variables that changed from the last permit cycle to this one so a simple comparison of effluent limits from one permit to the other is not a reliable determination of degradation.

Table 1. Assimilative Capacity Analysis for Outfall 001 (Lake Creek)[1]

Pollutant	Units	2007 Permit Limit	Draft Permit Limit	% Change in Assimilative Capacity[1]	Human Health Criteria/ MCLG [2]
Flow Tier 1					
Mercury AML	µg/L	0.011	0.010	-0.6	0.15
Mercury MDL	µg/L	0.022	0.020	-1.1	0.15
Flow Tier 2					
Mercury AML	µg/L	0.012	0.010	-1.0	0.15
Mercury MDL	µg/L	0.023	0.020	-1.4	0.15
Flow Tier 3					
Mercury AML	µg/L	0.014	0.011	-0.8	0.15
Mercury MDL	µg/L	0.027	0.022	-1.2	0.15
Flow Tier 1					
Copper AML	µg/L	7.7	7.2	0	1300
Copper MDL	µg/L	21	20.6	0	1300
Flow Tier 2					
Copper AML	µg/L	5.7	7.3	0.1	1300
Copper MDL	µg/L	15	20.6	0.4	1300
Flow Tier 3					
Copper AML	µg/L	3.8	6.5	0.2	1300
Copper MDL	µg/L	10	18.5	0.5	1300
Flow Tier 4					
Copper AML	µg/L	4.4	7.1	0.1	1300
Copper MDL	µg/L	12	20.3	0.3	1300
Flow Tier 5					
Copper AML	µg/L	8.2	4.0	0	1300
Copper MDL	µg/L	23	11.3	-0.1	1300

[1] This analysis was done using the following inputs: Upstream critical flow for mercury and copper was the lowest flow in the draft permit's flow tier ranges and 0.15 for flow Tier 1; Upstream critical low flow is 0.15 cfs; Critical flow upstream hardness is 116.2 mg/L; Upstream pollutant concentration is the 90th percentile of quarterly instream monitoring; Results of mercury instream monitoring above the Outfall were all non-detects (<0.001); Copper and mercury mixing zones used to calculate proposed effluent limits were 25% of the low flow for each Tier (see Permit Table 2); 2007 permit effluent flow rate was 3.44 cfs and the proposed permit effluent flow rate is 4.59 cfs. See *Discharge Information* section for discussion.

[2] See discussion under *Pollutants with Limits in the Current and Proposed Permit- Cadmium, Copper, Lead, Mercury, and Zinc*.

- **Assimilative Capacity Analysis for Copper and Mercury Outfall 002 (South Fork Coeur d'Alene River)**

Using the monitoring data from the 2007 permit cycle, DEQ can determine if the increase in effluent flow from outfall 002 significantly degraded water quality. Table 2 contains the data used in this analysis. Significant degradation occurs when the discharge of the pollutant will cumulatively decrease the remaining assimilative capacity by more than 10% percent or, if less than 10%, when determined by the Department to be significant (IDAPA 58.01.02.052.08.a).

Table 2. Assimilative Capacity Analysis for Outfall 002 (South Fork Coeur d'Alene River)[1]

Pollutant	Units	2007 Permit	Draft Permit	% Change in Assimilative Capacity[1]	Human Health Criteria/MCLG [2]
Flow Tier 5					
Mercury AML	µg/L	1.0	1.0	0.4	0.15
Mercury MDL	µg/L	2.0	2.0	0.7	0.15
Flow Tier 1					
Copper AML	µg/L	56	42.0	0	1300
Copper MDL	µg/L	120	112.8	0.1	1300
Flow Tier 2					
Copper AML	µg/L	64	44.5	0	1300
Copper MDL	µg/L	130	119.5	0.1	1300

[1] This analysis was done using the following inputs: Upstream critical flow for mercury and copper are the lowest flow in the draft permit's flow tier ranges and 60.4 cfs for flow Tier 1; Upstream critical low flow is 60.4 cfs; Critical flow upstream hardness is 76.4 mg/L (copper); Upstream pollutant concentration is the 90th percentile of quarterly instream monitoring; Results of mercury instream monitoring above the Outfall were all non-detects (<0.001); Copper and mercury mixing zones used to calculate the proposed effluent limits were 25% of the low flow for each Tier (see Permit Table 3); 2007 effluent flow rate was 1.27 cfs and the proposed permit effluent flow rate is 1.88cfs. See *Discharge Information* section for discussion.

[2] See discussion under *Pollutants with Limits in the Current and Proposed Permit- Cadmium, Copper, Lead, Mercury, and Zinc*.

- **Assimilative Capacity Conclusion Outfalls 001 and 002- Copper and Mercury**

The results of the assimilative capacity analyses of copper and mercury for Outfalls 001 and 002 show less than a 10% reduction in assimilative capacity and DEQ has determined that the calculated increases are insignificant (IDAPA 58.01.02.052.08). Therefore, no further Tier II analysis is required for these pollutants.

New Permit Limits for Pollutants Currently Discharged- Arsenic and *E. coli*

When new limits are proposed in a reissued permit for pollutants in the existing discharge, the effect on water quality is based upon the current discharge quality and the proposed discharge quality resulting from the new limits. Current discharge quality for pollutants that are not currently limited is based upon available discharge quality data (IDAPA 58.01.02.052.06.a.i). Future discharge quality is based upon proposed permit limits (IDAPA 58.01.02.052.06.a.ii).

The proposed permit for Galena Complex includes new limits for arsenic at Outfall 001 and *E. coli* at both outfalls (Tables 3 and 4). These limits were included in the permit because a reasonable potential analysis determined they could cause or contribute to an exceedance of water quality standards. To determine if there was water quality degradation due to the effluent flow increase seen during the 2007 permit cycle, a mass balance equation was used due to a lack of water quality data.

Results of the evaluation for arsenic in Lake Creek indicated that the assimilative capacity for arsenic was reduced by 0.7 % as a result of the increased effluent flow. For this calculation, upstream concentrations of arsenic were assumed to be zero due to a lack of instream data. Instream monitoring for arsenic was added as a certification condition for the proposed permit. Arsenic is not a pollutant of concern for outfall 002 with no monitoring requirement and no effluent limits. Therefore, no arsenic assimilative capacity analysis was performed for outfall 002.

Arsenic calculation values for Outfall 001: 7ug/L (max effluent concentration); upstream flow 0.15 cfs; effluent flow from 3.44 cfs to 4.59 cfs;

The increase in *E. coli* was similarly evaluated in Lake Creek using an average effluent value of 92 organisms/100mL, secondary contact recreation criteria of 126 organisms/100mL, and a background of 31 organisms/100 mL upstream of the outfall (DEQ data collected in 2017). Results were 0.7% decrease in assimilative capacity.

The increase in E. coli was evaluated in South Fork Coeur d'Alene River using an average effluent value of 34 organisms/100 mL, secondary contact recreation criteria of 126 organisms/100 mL, and a background of 20 organisms/100mL upstream of the outfall (DEQ data collected in 2017). Results were 0.1% decrease in assimilative capacity.

Formula used to calculate mixed concentrations:

Cm = [(Ce * Qe) + (Cu * Qu)] / (Qe+Qu)

Where:

Cm = Mixed Concentration (µg/L)
Ce = Effluent Concentration (µg/L)
Qe = Effluent Volume (liters, calculated as flow rate in cfs * constant 28.316)
Cu = Upstream concentration (µg/L)
Qu = Upstream Volume (liters, calculated as flow rate in cfs * constant 28.316)

Proposed mixed concentration – current mixed concentration ÷ (criterion – upstream concentration) X 100 = % reduction in assimilative capacity

The results of the assimilative capacity analyses for arsenic and *E. coli* were less than a 10% reduction in assimilative capacity and DEQ has determined that the calculated decrease is insignificant (IDAPA 58.01.02.052.08). Therefore, no adverse change in water quality and no degradation will occur with respect to these pollutants from either Outfall 001 or 002.

Pollutant with No Limit- Chromium VI and Antimony

Antimony and chromium VI are significant to Tier II protection of secondary contact recreation in Lake Creek and South Fork Coeur d'Alene River. They are not currently limited in the permit and the proposed permit also contains no limits (Tables 3 and 4). For such pollutants, a change in water quality is determined by reviewing whether changes in production, treatment, or operation that will increase the discharge of these pollutants are likely (IDAPA 58.01.02.052.06.a.ii).

The discharge of antimony and chromium VI are likely to increase due to the increase effluent flow during the 2007 permit cycle. DEQ must determine if this increase is a significant degradation of water quality. The Idaho WQS provides a "fish only" human health criterion for antimony of 190µg/L. The WQS does not provide a "fish only" human health criterion for Chromium VI. Thus, similar to the analysis for mercury and copper, DEQ must determine an appropriate value to use in place of a numeric criterion for chromium VI. Unlike copper and mercury, there is no Safe Drinking Water Act MCLG for chromium VI. In the absence of an MCLG, DEQ consulted the EPA's *Quality Criteria for Water 1986* (the "Gold Book"), which recommends a criterion of 50µg/L for the protection of human health against ingestion of both contaminated water and contaminated aquatic organisms. Considering that Idaho's secondary contact recreation use is designed to protect activities where ingestion of raw water is unlikely (IDAPA 58.01.02.100.02.b), using a value intended to protect against ingestion of chromium VI in both water and aquatic organisms is conservative and protective of the secondary contact recreation use. Therefore, DEQ has determined that 50µg/L is a reasonable and appropriate value for this purpose.

For the assimilative capacity analysis, DEQ used the above mass balance equation, assumed Lake Creek and South Fork Coeur d'Alene River instream concentrations upstream of the Outfalls to be zero, a chromium VI effluent concentration of 14µg/L (max effluent concentration) for Outfall 001, and an antimony effluent concentration of 30µg/L (max effluent concentration) for Outfalls 001 and 002. An antimony concentration of 190µg/L and a chromium VI concentration of 50µg/L represent the levels of water quality protective of secondary contact recreation for these pollutants. The result was that due to the increased effluent flow, assimilative capacity for antimony for Outfall 001 is decreased by 0.2% and Outfall 002 is decreased by 0.2%. Chromium VI assimilative capacity for Outfall 001 is decreased by 0.4%.

Chromium VI is not a pollutant of concern for outfall 002 with no monitoring requirement and no effluent limits. Therefore, no chromium VI assimilative capacity analysis was performed for outfall 002.

The results of the assimilative capacity analyses for antimony and chromium VI was less than a 10% reduction in assimilative capacity and DEQ has determined that the calculated increases are insignificant (IDAPA 58.01.02.052.08). Therefore, no adverse change in water quality and no degradation will occur with respect to antimony and chromium VI in Lake Creek or South Fork Coeur d'Alene River.

Table 3. Comparison of current and proposed permit limits at Outfall 001 Lake Creek [cd]

Parameter	Units	2007 Permit			Proposed Permit			Change[a]
		Flow Tier (cfs)	Average Monthly Limit	Maximum Daily	Flow Tier (cfs)	Average Monthly Limit	Maximum Daily	
Pollutants with limits in both the current and proposed permit								
Cadmium	µg/L	n/a	0.87	1.9	n/a	0.87	1.6	D
	lb/day	n/a	0.012	0.027	n/a	0.012	0.027	NC
Lead	µg/L	n/a	27	58	n/a	24.1	58	D
	lb/day	n/a	0.39	0.81	n/a	0.39	0.81	NC
Zinc	µg/L	n/a	87	195	n/a	87	195	NC
	lb/day	n/a	1.2	2.7	n/a	1.2	2.7	
Copper (flow Tier 1)	µg/L	<1.7	7.7	21	<0.51	7.2	20.6	D
	lb/day		0.11	0.29		0.18	0.51	D
Copper (flow Tier 2)	µg/L	1.7 to <13.8	5.7	15	0.51 to <1.9	7.3	20.6	I
	lb/day		0.079	0.21		0.18	0.49	I
Copper (flow Tier 3)	µg/L	3.8 to <13.4	3.8	10	1.9 to <6.0	7.0	19.9	I
	lb/day		0.053	0.14		0.17	0.49	I
Copper (flow Tier 4)	µg/L	13.4 to <23	4.4	12	6.0 to <21.3	7.1	20.3	I
	lb/day		0.061	0.17		0.8	0.52	I
Copper (flow Tier 5)	µg/L	≥23	8.2	23	≥21.3	4.0	11.3	D
	lb/day		0.11	0.32		0.1	0.28	I
Copper (BLM)[b]	µg/L	-	-	-	n/a	0.4	1.0	D
	lb/day	-	-	-		0.009	0.025	
Mercury (flow Tier 1)	µg/L	<1.7	0.011	0.022	<0.51	0.010	0.020	D
	lb/day		0.00015	0.00030		0.0003	0.0005	I
Mercury (flow Tier 2)	µg/L	1.7 to <3.8	0.012	0.023	0.51 to <1.9	0.010	0.020	D
	lb/day		0.00017	0.00032		0.0003	0.0005	I
Mercury (flow Tier 3)	µg/L	3.8 to <13.4	0.014	0.027	1.9 to <6.0	0.011	0.022	D
	lb/day		0.00019	0.00037		0.0003	0.0005	I
Mercury (flow Tier 4)	µg/L	13.4 to <23	0.035	0.071	6.0 to <21.3	0.013	0.026	D
	lb/day		0.00048	0.00098		0.0003	0.0007	I
Mercury (flow Tier 5)	µg/L	≥23	0.054	0.11	≥21.3	0.021	0.043	I
	lb/day		0.00075	0.0015		0.0011	0.0005	I
TSS	mg/L	n/a	20	30	n/a	20	30	NC
	lb/day		202	560		≤202 lbs/day		D
pH	s.u.	6.5–9.0 all times			6.5–9.0 all times			NC
Pollutants with new limits in the proposed permit								
Arsenic (flow Tier 1)	µg/L	n/a	-	-	<0.51	6.6	13.2	D
	lb/day		-	-		0.16	0.33	
Arsenic (flow Tier 2)	µg/L	n/a	-	-	0.51 to <1.9	6.6	13.2	D
	lb/day		-	-		0.16	0.33	
E. coli	colonies/100mL	n/a	—	Report	n/a	126	576	D
Pollutants with no limits in either the current and proposed permit								
Chromium VI	µg/L	-	-	Report	-	-	Report	NC
Temperature	°C	—	—	Report	—	—	Report	NC
Hardness	mg/L as $CaCO_3$	—	—	Report	_	—	Report	NC
Whole Effluent Toxicity	TUc	-	-	Report	-	-	Report	NC

[a] NC = no change in effluent limit from current permit; I = increased effluent limit from current permit; D = decreased effluent limit from current permit;
[b] Biotic Ligand Model is not yet approved by EPA for calculation of the copper water quality criteria. The method used to calculate criteria for copper that is in effect at the time of permit issuance will be used to determine final effluent limits.
[c] When comparing current permit limits to proposed permit limits please read the *Discharge Information* section of this certification to learn about variables that affect effluent limits.
[d] This Table is for comparative purposes only.

Table 4. Comparison of current and proposed permit limits at Outfall 002 South Fork Coeur d'Alene River [cd]

Parameter	Units	2007 Permit			Proposed Permit			Change[a]
		Flow Tier (cfs)	Average Monthly Limit	Maximum Daily	Flow Tier (cfs)	Average Monthly Limit	Maximum Daily	
Pollutants with limits in both the current and proposed permit								
Cadmium	µg/L	n/a	0.91	2.6	n/a	0.8	1.3	D
	lb/day	n/a	0.007	0.019	n/a	0.007	0.013	
Lead	µg/L	n/a	32	88	n/a	16.0	40.0	D
	lb/day	n/a	0.24	0.66	n/a	0.163	0.406	
Zinc	µg/L	n/a	85	237	n/a	85	163.5	D
	lb/day	n/a	0.63	1.8	n/a	0.63	1.66	
Copper (flow Tier 1)	µg/L	<48	56	120	<63	42.0	112.84	D
	lb/day		0.42	0.90		0.43	1.14	I
Copper (flow Tier 2)	µg/L	48 to 109	64	130	63 to 87	44.5	119.5	D
	lb/day		0.48	0.97		0.45	1.21	I
Copper (flow Tier 3)	µg/L	109 to 379	110	230	87 to 135	58.7	157.9	D
	lb/day		0.82	1.7		0.60	1.60	D
Copper (flow Tier 4)	µg/L	379 to 649	150	300	135 to 1135	86.4	232.3	D
	lb/day		1.1	2.2		0.88	2.36	D
Copper (flow Tier 5)	µg/L	≥649	150	300	≥1135	150	300	NC
	lb/day		1.1	2.2		1.52	3.04	I
Copper (BLM)[b]	µg/L	-	-	-	n/a	0.4	1.0	D
	lb/day	-	-	-		0.025	0.009	
Mercury (flow Tier 1)	µg/L	<48	0.12	0.24	<63	0.089	0.178	D
	lb/day		0.00090	0.0018		0.0009	0.0018	NC
Mercury (flow Tier 2)	µg/L	48 to 109	0.18	0.35	63 to 87	0.092	0.185	D
	lb/day		0.0013	0.0026		0.0009	0.0019	D
Mercury (flow Tier 3)	µg/L	109 to 379	0.20	0.41	87 to 135	0.0123	0.248	D
	lb/day		0.0015	0.0031		0.0013	0.0025	D
Mercury (flow Tier 4)	µg/L	379 to 649	0.68	1.4	135 to 1135	0.186	0.373	D
	lb/day		0.0051	0.011		0.0019	0.0038	D
Mercury (flow Tier 5)	µg/L	≥649	1.0	2.0	≥1135	1.0	2.0	NC
	lb/day		0.0075	0.014		0.0101	0.0203	I
TSS	mg/L	n/a	20	30	n/a	20	30	NC
	lb/day		80	248		≤80 lbs/day		D
pH	s.u.	6.5–9.0 all times			6.5–9.0 all times			NC
Pollutants with new limits in the proposed permit								
E. coli	colonies/100mL	n/a	—	Report	n/a	126	576	D
Pollutants with no limits in either the current and proposed permit								
Temperature	°C	—	—	Report	—	—	Report	NC
Hardness	mg/L as $CaCO_3$	—	—	Report	_	—	Report	NC
Whole Effluent Toxicity	TUc	-	-	Report	-	-	Report	NC

[a] NC = no change in effluent limit from current permit; I = increased effluent limit from current permit; D = decreased effluent limit from current permit;
[b] Biotic Ligand Model is not yet approved by EPA for calculation of the copper water quality criteria. The method used to calculate criteria for copper that is in effect at the time of permit issuance will be used to determine final effluent limits.
[c] When comparing current permit limits to proposed permit limits please read the *Discharge Information* section of this certification to learn about variables that affect effluent limits.
[d] This Table is for comparative purposes only.

In summary, DEQ concludes that this discharge permit complies with the Tier II provisions of Idaho's WQS (IDAPA 58.01.02.051.02 and IDAPA 58.01.02.052.06).

Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

Compliance Schedule

Pursuant to IDAPA 58.01.02.400.03, DEQ may authorize compliance schedules for water quality–based effluent limits issued in a permit for the first time.

Compliance Schedule for Copper BLM Based Effluent Limits

Although the copper BLM based criteria are not currently in effect, for reasons of efficiency, DEQ is proposing this compliance schedule in the event the BLM based criteria becomes effective (obtains EPA approval) prior to issuance of the final permit. Galena Complex cannot immediately achieve compliance with the BLM based effluent limits for copper; therefore, DEQ authorizes a compliance schedule and interim requirements as set forth below. The copper BLM effluent limits are based on conservative estimates of water quality, not actual water quality data. To obtain the actual copper criteria that will be used to calculate future copper effluent limits, the first two years of this compliance schedule allows time for the permittee to collect in-stream monitoring data to determine their BLM based copper effluent limits. In this way, the mine can most effectively design a copper removal system that assures final limits can be met. This compliance schedule is only effective if BLM based copper effluent limits are retained in the final permit.

Table 5. Interim Limits Outfall 001 (Lake Creek) Copper BLM

Parameter	Units	Outfall 001		
		Flow Tier (cfs)	Average Monthly Limit	Maximum Daily
Copper (flow Tier 1)	µg/L	<1.7	7.7	21
	lb/day		0.11	0.29
Copper (flow Tier 2)	µg/L	1.7 to <13.8	5.7	15
	lb/day		0.079	0.21
Copper (flow Tier 3)	µg/L	3.8 to <13.4	3.8	10
	lb/day		0.053	0.14
Copper (flow Tier 4)	µg/L	13.4 to <23	4.4	12
	lb/day		0.061	0.17
Copper (flow Tier 5)	µg/L	≥23	8.2	23
	lb/day		0.11	0.32

Table 6. Interim Limits Outfall 002 (South Fork Coeur d'Alene River) Copper BLM

Parameter	Units	Outfall 002		
		Flow Tier (cfs)	Average Monthly Limit	Maximum Daily
Copper (flow Tier 1)	µg/L	<48	56	120
	lb/day		0.42	0.90
Copper (flow Tier 2)	µg/L	48 to 109	64	130
	lb/day		0.48	0.97
Copper (flow Tier 3)	µg/L	109 to 379	110	230
	lb/day		0.82	1.7
Copper (flow Tier 4)	µg/L	379 to 649	150	300
	lb/day		1.1	2.2
Copper (flow Tier 5)	µg/L	≥649	150	300
	lb/day		1.1	2.2

The Galena Complex relies on settlement of solids in tailings impoundments as their only means of water treatment. This method cannot reliably reduce metals concentrations to meet the copper BLM effluent limits. If the final permit contains the BLM limits this compliance schedule will be used to ensure that the facility has the time to construct a water treatment plant capable of copper removal. Due to the large capital investment needed to construct a water treatment plant and capture and treat effluent from both outfalls, DEQ authorizes a period of twelve (12) years from the effective date of the final permit to meet final effluent limits for copper. The compliance schedule and interim requirements provides the permittee a reasonable amount of time to achieve the final effluent limits as specified in the proposed permit. At the same time, the schedule ensures that compliance with final effluent limits is accomplished as soon as possible.

- The permittee must comply with all effluent limitations and monitoring requirements in Part I of the final permit beginning on the effective date of the permit, except those for which a compliance schedule is specified.

- The permittee must achieve compliance with the final effluent limitations for copper as set forth in Part I.B. (Tables 2 and 3) of the final permit, not later than twelve (12) years after the effective date of the final permit.

- While the schedules of compliance specified in Part II.A. are in effect, the permittee must complete interim requirements and meet interim effluent limits and monitoring requirements as specified in Part II.A. of the permit.

- All other provisions of the permit, except the final effluent limits for copper as described in Tables 5 and 6 of this certification, must be met after the effective date of the final permit.

Interim Requirements for Copper BLM Compliance Schedule

1. By one (1) year from the effective date of the final permit, the permittee must provide to EPA and DEQ a summary of the first year of copper BLM monitoring data as specified in Part I.D. of the permit.

2. By two (2) years from the effective date of the final permit, the permittee must provide to EPA and DEQ a summary of the second year of copper BLM monitoring data as specified in Part I.D. of the permit.

3. By three (3) years after the effective date of the final permit, the permittee must provide a preliminary engineering report to EPA and DEQ outlining estimated costs and schedules for completing implementation of technologies to achieve final effluent limitations. This schedule must include a timeline for pilot testing and results of any testing conducted to date.

4. By five (5) years after the effective date of the final permit, the permittee must provide written notice to EPA and DEQ that pilot testing of the technology that will be employed to achieve the final limits has been completed and must submit a summary report of results and plan for implementation. If pilot testing is determined to be unnecessary by the permittee, the summary report shall include the reasons for this decision.

5. By seven (7) years after the effective date of the final permit, the permittee must provide EPA and DEQ with written notice that design has been completed and bids have been awarded to begin construction to achieve final effluent limitations.

6. By ten (10) years after the effective date of the final permit, the permittee must provide EPA and DEQ with written notice that construction has been completed on the facilities to achieve final effluent limitations.

7. By twelve (12) years after the effective date of the final permit, the permittee must provide EPA and DEQ with a written report providing details of a completed start up and optimization phase of the new treatment system and must achieve compliance with the final effluent limitations of Part I.B. The report shall include two years of effluent data demonstrating that final effluent limits can be achieved by year twelve (12).

8. By years four (4), six (6), eight (8), nine (9), and eleven (11), after the effective date of the final permit, the permittee must submit to EPA and DEQ progress reports, which outline the progress made toward achieving compliance with the copper effluent limitations. At a minimum, the reports must include:
   a) An assessment of the previous year of effluent data and comparison to the interim effluent limitations.
   b) A report on progress made toward meeting the final effluent limits.
   c) Further actions and milestones targeted for the upcoming year.

Compliance Schedule for Other Metals

The Galena Complex cannot immediately achieve compliance at Outfall 001 with the cadmium, lead, mercury, and hardness-based copper effluent limitations and at Outfall 002 with the lead, zinc, and hardness-based copper effluent limitations; therefore, DEQ authorizes a compliance schedule and interim requirements as set forth below. Similar to the copper BLM discussion above, the Galena Complex relies on settlement of solids in tailings impoundments as

their only means of water treatment. This method cannot reliably reduce metals concentrations to meet new cadmium, hardness-based copper, lead, zinc and mercury effluent limits.

The compliance schedule for hardness-based copper is only effective if the BLM based copper effluent limits are not retained in the final permit. If BLM based copper effluent limits are retained in the final permit this compliance schedule runs concurrent to the compliance schedule for the copper BLM based effluent limits for twelve (12) years. If the BLM based copper effluent limits are not retained in the final permit, this first two years of this compliance schedule are eliminated because progress towards meeting final effluent limits does not rely on collection of data for the BLM and the schedule is reduced to a ten (10) year length of time.

Lower effluent limitations for cadmium, lead, zinc, mercury and hardness-based copper are in the permit for the first time due to the following factors:

(1) Mixing zones authorized by this certification for copper and mercury for some flow tiers at both Outfalls are smaller than those authorized for the current permit.

(2) The current permit used an estimated flow for Lake Creek. The proposed permit used actual flow data collected by the permittee which lowered effluent limits for copper and mercury at Outfall 001. There is less water available for dilution than previously estimated.

(3) A different CV was used in the statistical analysis for all metals to develop effluent limits for both Outfalls. In the case of cadmium and lead at Outfall 001 the new CVs decreased effluent limits.

(4) An increase in effluent flow from the last permit cycle increased loading for all pollutants at both Outfalls.

(5) The correction of an error discovered in the previous permit resulted in decreased limitations for cadmium, lead, and zinc for Outfall 002. The compliance schedule allows the permittee time to develop treatment technologies to comply with their new limits. No compliance schedule is authorized for cadmium at Outfall 002 because the permittee can meet the new limits. This error only affected effluent limitations for cadmium, lead, and zinc for Outfall 002. Outfall 001 was unaffected because Lake Creek is an effluent dominated stream during critical low flow timeframes. As a result there was little change in hardness used to calculate criteria for Outfall 001.

To give the permittee time to meet their final effluent limits, a 12 year compliance schedule is authorized. This schedule, by necessity, tracks with the copper BLM schedule since the same planning, design, and construction will be required to meet final effluent limitations for cadmium, hardness-based copper, lead, zinc and mercury.

Table 7. Interim Limits Outfall 001 (Lake Creek) Other Metals

Parameter	Units	Outfall 001		
		Flow Tier (cfs)	Average Monthly Limit	Maximum Daily
Cadmium	µg/L	n/a	n/a	1.9
	lb/day	n/a	n/a	0.027
Lead	µg/L	n/a	27	58
	lb/day	n/a	0.39	0.81
Copper (flow Tier 1)	µg/L	<1.7	7.7	21
	lb/day		0.11	0.29
Copper (flow Tier 5)	µg/L	≥23	8.2	23
	lb/day		0.11	0.32
Mercury (flow Tier 1)	µg/L	<1.7	0.011	0.022
	lb/day		0.00015	0.00030
Mercury (flow Tier 2)	µg/L	1.7 to <3.8	0.012	0.023
	lb/day		0.00017	0.00032
Mercury (flow Tier 3)	µg/L	3.8 to <13.4	0.014	0.027
	lb/day		0.00019	0.00037
Mercury (flow Tier 4)	µg/L	13.4 to <23	0.035	0.071
	lb/day		0.00048	0.00098
Mercury (flow Tier 5)	µg/L	≥23	0.054	0.11
	lb/day		0.00075	n/a

Table 8. Interim Limits Outfall 002 (South Fork Coeur d'Alene River) Other Metals

Parameter	Units	Outfall 002		
		Flow Tier (cfs)	Average Monthly Limit	Maximum Daily
Lead	µg/L	n/a	32	88
	lb/day	n/a	0.24	0.66
Zinc	µg/L	n/a	n/a	237
	lb/day	n/a	n/a	1.8
Copper (flow Tier 1)	µg/L	<48	56	120
	lb/day		0.42	0.90
Copper (flow Tier 2)	µg/L	48 to 109	64	130
	lb/day		0.48	0.97
Copper (flow Tier 3)	µg/L	109 to 379	110	230
	lb/day		0.82	1.7
Copper (flow Tier 4)	µg/L	379 to 649	150	300
	lb/day		1.1	2.2

Interim Requirements for Other Metals Compliance Schedule

1. By one (1) year from the effective date of the final permit, the permittee must provide to EPA and DEQ a summary of the first year of copper BLM monitoring data as specified in Part I.D. of the permit. If hardness-based copper effluent limits are retained in the final permit this requirement and timeframe is eliminated.

2. By two (2) years from the effective date of the final permit, the permittee must provide to EPA and DEQ a summary of the second year of copper BLM monitoring data as specified in Part I.D. of the permit. If hardness-based copper effluent limits are retained in the final permit this requirement and timeframe is eliminated.

3. By three (3) years (or one (1) year if hardness-based copper limits are retained in the final permit) after the effective date of the final permit, the permittee must provide a preliminary engineering report to EPA and DEQ outlining estimated costs and schedules for completing implementation of technologies to achieve final effluent limitations. This schedule must include a timeline for pilot testing and results of any testing conducted to date.

4. By five (5) years (or three (3) years if hardness-based copper limits are retained in the final permit) after the effective date of the final permit, the permittee must provide written notice to EPA and DEQ that pilot testing of the technology that will be employed to achieve the final limits has been completed and must submit a summary report of results and plan for implementation. If pilot testing is determined to be unnecessary by the permittee, the summary report shall include the reasons for this decision.

5. By seven (7) years (or five (5) years if hardness-based copper limits are retained in the final permit) after the effective date of the final permit, the permittee must provide EPA and DEQ with written notice that design has been completed and bids have been awarded to begin construction to achieve final effluent limitations.

6. By ten (10) years (or eight (8) years if hardness-based copper limits are retained in the final permit) after the effective date of the final permit, the permittee must provide EPA and DEQ with written notice that construction has been completed on the facilities to achieve final effluent limitations.

7. By twelve (12) years (or ten (10) years if hardness-based copper limits are retained in the final permit) after the effective date of the final permit, the permittee must provide EPA and DEQ with a written report providing details of a completed start up and optimization phase of the new treatment system and must achieve compliance with the final effluent limitations of Part I.B. The report shall include two years of effluent data demonstrating that final effluent limits can be achieved by year twelve (12).

8. By years four (4), six (6), eight (8), nine (9), and eleven (11), (or two (2), four (4), six (6), seven (7), and nine (9) years if hardness-based copper limits are retained in the final permit) after the effective date of the final permit, the permittee must submit to EPA and DEQ progress reports, which outline the progress made toward achieving compliance with the

cadmium, lead, zinc, copper and mercury effluent limitations. At a minimum, the reports must include:

d) An assessment of the previous year of effluent data and comparison to the interim effluent limitations.
e) A report on progress made toward meeting the final effluent limits.
f) Further actions and milestones targeted for the upcoming year.

Mixing Zones

Pursuant to the 2014 Idaho Water Quality Standards (IDAPA 58.01.02.060), DEQ authorizes a mixing zone that utilizes the following critical flow volumes of Lake Creek and South Fork Coeur d'Alene River for copper, mercury, arsenic, and antimony for both Outfalls. These mixing zones are also consistent with the current but yet unapproved mixing zone policy. No mixing zone is authorized for the copper BLM derived effluent limits. Using conservative BLM model inputs in lieu of in-stream data, there is no remaining assimilative capacity in either waterbody for dilution. Using the hardness-based method to calculate copper criteria there is sufficient capacity to allow flow tier based mixing zones.

Table 9. Authorized mixing zones for Lake Creek (Outfall 001) by pollutant and flow tier

Pollutant/Flow Tier	Percent Mixing Zone
copper Tier 1	25% of 7Q10 and 1Q10
copper Tier 2	25% of 10th percentile flow
copper Tier 3	25% of 50th percentile flow
copper Tier 4	25% of 70th percentile flow
copper Tier 5	25% of 90th percentile flow
mercury Tier 1	25% of 7Q10 and 1Q10
mercury Tier 2	25% of 10th percentile flow
mercury Tier 3	25% of 50th percentile flow
mercury Tier 4	25% of 70th percentile flow
mercury Tier 5	25% of 90th percentile flow
arsenic Tier 1	25% of the harmonic mean
arsenic Tier 3	25 % of the 50th percentile flow
arsenic Tier 4	25% of the 70th percentile flow
arsenic Tier 5	25% of the 90th percentile flow
antimony Tier 1	25% of the 30Q5
antimony Tier 2	25% of the 10th percentile flow
antimony Tier 3	25% of the 50th percentile flow
antimony Tier 4	25% of the 70th percentile flow
antimony Tier 5	25% of the 90th percentile flow

Alternative Limitations

The following subsection(s) discuss how the permit can be made less stringent and still comply with Idaho WQS.

Methylmercury Fish Tissue Monitoring

DEQ has determined that methylmercury monitoring is not necessary to meet WQS because fish tissue sampling for methylmercury has already been completed. In 2016 fish in the South Fork Coeur d'Alene River were collected by DEQ at various locations including below Outfall 002 to determine concentrations of methylmercury in their tissue. The purpose of this monitoring was to determine if there are human health risks from the consumption of fish in the South Fork Coeur d'Alene River. Data indicated that methylmercury in the South Fork Coeur d'Alene River fish tissue does not result in elevated human health risks from consumption (*Draft Letter Health Consultation Coeur d'Alene Basin Fish Tissue Analysis and Consumption Advisory, Coeur d'Alene Idaho*, November, 2018). Results of this monitoring effort will be reported by the Idaho Department of Health and Welfare in 2019. DEQ has determined that this monitoring data meets sufficient rigor, quality and relevance to determine if an impairment of a beneficial use exists, to update the Integrated Report, and inform future permits (IDAPA 58.01.02.054.05). No additional monitoring is required to accomplish these tasks. In addition, fish populations in the South Fork Coeur d'Alene River are depressed and additional lethal sampling of these populations is unwarranted.

Other Conditions

1. The permittee shall consult with and obtain approval from DEQ for all in-stream monitoring locations.
2. Water chemistry data collected for use in the biotic ligand model shall follow the *Implementation Guidance for the Idaho Copper Criteria for Aquatic Life* August, 2017 to guide this sampling effort.
3. After 24 consecutive monthly samples for the copper BLM have been collected, the permittee may request that BLM instream monitoring may be decreased to quarterly upon DEQ approval and after DEQ review and approval of data quality.
4. Upon DEQ approval of the 24 consecutive monthly instream samples for the copper BLM criteria, the permittee may request reopening of the permit to recalculate the copper BLM effluent limits using the updated copper BLM criteria.
5. Arsenic, chromium VI, and antimony monitoring for Lake Creek above the Outfall 001 shall be added as a requirement to the proposed permit part I.D.
6. Chromium VI and antimony monitoring for South Fork Coeur d'Alene River above the Outfall shall be added as a requirement to the proposed permit part I.D.

7. Temperature shall be sampled upstream and downstream of each Outfall for at least two consecutive years during the June through November timeframe. Temperature monitoring shall begin after the effective date of the permit on June 1 and ending November 30. After two consecutive years of data, no surface water temperature monitoring is required other than that necessary for the copper BLM. Permittee shall contact DEQ Coeur d'Alene Regional Office prior to start of temperature monitoring to obtain DEQ approval of the frequency and location for temperature monitoring.

8. This certification is conditioned upon the requirement that any material modification of the permit or the permitted activities—including without limitation, any modifications of the permit to reflect new or modified TMDLs, wasteload allocations, site-specific criteria, variances, or other new information—shall first be provided to DEQ for review to determine compliance with Idaho WQS and to provide additional certification pursuant to Section 401.

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative Procedure before the Board of Environmental Quality" (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to June Bergquist Coeur d'Alene Regional Office (208) 666-4605 or email at june.bergquist@deq.idaho.gov .

DRAFT

Daniel Redline

Regional Administrator

Coeur d'Alene Regional Office