

**FACT SHEET AND STATEMENT OF BASIS
BRONCO UTAH OPERATIONS, LLC. – EMERY UNDERGROUND MINE
UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES)
DISCHARGE RENEWAL PERMIT
UPDES PERMIT NUMBER: UT0022616
MAJOR INDUSTRIAL FACILITY**

FACILITY CONTACT INFORMATION

Contact Name: Brian Fredrickson
Position: President/CEO
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Emery, Utah 84522
Facility Location: 550 South Hwy 10 on Consol Road
Emery, Utah 84522

DESCRIPTION OF FACILITY

The Bronco Utah Operations, LLC (formerly known as CONSOL Energy) – Emery Underground Mine (Mine) is an active underground coal mine facility with *Standard Industrial Classification Code 1222 - bituminous underground coal mining operations* and is located near the town of Emery, Utah. The Mine currently has nine (9) permitted discharge points known as Outfalls 001 through 009. In 2021, the Mine produced approximately 1.2 million tons of coal and has been continually pumping and discharging intercepted groundwater during active Mine operations since the early 1980's.

Over the last 5 years, the Mine has only discharged mine water from Outfalls 001 & 003 with an average total effluent flow range of 0.4 million gallons per day (MGD) to 1.5 MGD. Currently Outfall 001 is the only active discharge point from the Mine. Outfall 004 & 005 have not discharged mine water to date, but may be used in the future for Mine dewatering operations. Historically, discharges from the Mine have been exclusively comprised of intercepted groundwater from the mine area, as there has not been enough accumulated storm water to discharge from any of the storm water sedimentation ponds for over 20 years (Outfalls 002, 006, 007 & 009).

Outfall 008 has not been developed to date. However, this outfall is identified in a plan for future activities maintained by the Division of Oil Gas and Mining. Therefore, it is included as an authorized outfall once again in this renewal permit.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

There are several changes being proposed with this renewal permit and the following list is a summary of those changes when compared to the previous permit:

1. The total effluent flow limit has been increased from 1.5 MGD to 3.0 MGD at the request of the Mine for future anticipated mine dewatering needs.
2. The Storm Water permit provisions have been removed as part of a Division of Water Quality (DWQ) programmatic separation of the previously combined UPDES industrial permits. The Mine will now be required to apply for and obtain separate UPDES Industrial Storm Water Permit coverage under the UPDES MSGP No. UTR000000, or an applicable exemption as described further in the Storm Water section of this Fact Sheet.
3. Turbidity monitoring of the effluent discharge has been included in lieu of the Total Suspended Solids (TSS) secondary treatment standards to reflect rule changes in Utah Administrative Code (UAC) R317-1-3, which clarifies that secondary standards for both TSS and biochemical oxygen demand are not applicable for Non-POTW facilities. Publicly Owned Treatment Works (POTWs) are facilities that receive and process domestic waste water. The Mine is an industrial and Non-POTW type facility and therefore, secondary treatment standards do not apply. However, the Federal effluent limit guideline found in 40 Code of Federal Regulations (CFR) Part 434.45 for the TSS Daily Maximum limitation still applies and remains in the permit as appropriate and as discussed further in the Basis for Effluent Limitations section of this Fact Sheet.
4. The Sulfate effluent concentration limit has been updated to reflect the current Wasteload Analysis (WLA).
5. The Whole Effluent Toxicity (WET) testing requirement has also been updated based upon the current WLA.
6. Monitoring for the total metals has been updated as discussed further in the Reasonable Potential Analysis section of this Fact Sheet.

All other permit limitations remain unchanged.

DISCHARGE INFORMATION

DESCRIPTION OF DISCHARGE OUTFALLS

The permitted discharging outfalls are as follows:

<u>Outfall Numbers</u>	<u>Location of Discharge Outfalls</u>
001	Discharge of mine water located at latitude 38° 51' 38" and longitude 111° 16' 09" from Sediment Pond #1 to Quitcupah Creek.
002	Discharge of storm water located at latitude 38° 51' 34" and longitude 111° 15' 24" from Sediment Pond #2 to Quitcupah Creek.

- 003 Discharge of mine water located at latitude 38° 52' 33" and longitude 111° 16' 53" from Sediment Pond #6 to Quitchupah Creek.
- 004 Discharge of mine water located at latitude 38° 52' 17" and longitude 111° 17' 41" from Sediment Pond #4 to Quitchupah Creek.
- 005 Discharge of mine water located at latitude 38° 51' 34" and longitude 111° 15' 23" from Sediment Pond #3 to Quitchupah Creek.
- 006 Discharge of storm water located at latitude 38° 51' 32" and longitude 111° 15' 30" from Sediment Pond #8 to Quitchupah Creek.
- 007 Discharge of storm water located at latitude 38° 51' 45" and longitude 111° 15' 45" from Sediment Pond #5 to Quitchupah Creek.
- 008 Slurry pond emergency discharge located at latitude 38° 51' 45" and longitude 111° 16' 15" from Sediment Pond #7 to Quitchupah Creek.
- 009 Discharge of storm water located at latitude 38° 52' 30" and longitude 111° 14' 08" from Sediment Pond #9 to Christiansen Wash.

RECEIVING WATERS AND STREAM CLASSIFICATION

According to Utah Administrative Code (UAC) R317-2-13.1, the receiving waters of Quitchupah Creek and tributaries, including Christiansen Wash, within this reach are classified 2B, 3C, and 4 as described further below:

- Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but not limited to, wading, hunting, and fishing.
- Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.
- Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

TOTAL MAXIMUM DAILY LOAD (TMDL) REQUIREMENTS

According to the Utah 2022 303(d) Water Quality Assessment, the assessment unit for this section of Quitchupah Creek (Quitchupah Creek and tributaries from confluence with Ivie Creek to U-10 crossing; UT14070002-007_00) was listed as impaired for benthic invertebrate assessment and total dissolved solids (TDS). TDS values in this area are naturally elevated due to the presence of shale layers. Several site-specific TDS standards have been developed in the watershed (Quitchupah, Ivie and Muddy Creeks) to address the impairment.

A TMDL was previously completed in 2004 to primarily address TDS in the greater West Colorado River Watershed (*Price River, San Rafael River and Muddy Creek TMDLs for Dissolved Solids – West Colorado Watershed Management Unit, Utah, April 2004*), which can be found online at <https://documents.deq.utah.gov/water-quality/watershed-protection/total-maximum-dailyloads/DWQ-2015-006611.pdf>.

BASIS FOR EFFLUENT LIMITATIONS

In accordance with regulations promulgated in 40 CFR Part 122.44 and in UAC R317-8-4.2, effluent limitations are derived from technology-based effluent limitations guidelines, Utah Secondary Treatment Standards (UAC R317-1-3.2) when applicable, or Utah Water Quality Standards (UAC R317-2). In cases where multiple limits have been developed, those that are more stringent may apply. In cases where no limits or multiple limits have been developed, Best Professional Judgment (BPJ) of the permitting authority may be used where applicable. “Best Professional Judgment” refers to a discretionary, best professional decision made by the permit writer based on precedent, prevailing regulatory standards, or other relevant information.

Permit limits can also be derived from a Wasteload Analysis (WLA), as is the case with the sulfate daily maximum concentration limit for example. The WLA incorporates Secondary Treatment Standards, Water Quality Standards, including any TMDL impairments as appropriate, Antidegradation Reviews (ADR) and designated uses into a water quality model that projects the effects of discharge concentrations on receiving water quality. Effluent limitations are those that the model demonstrates are sufficient to meet Utah Water Quality Standards in the receiving waters. During this UPDES renewal permit development and WLA process, an ADR Level I review was performed and concluded that an ADR Level II review was required since there is a proposed increase in total effluent flow as compared to the previous permit. The ADR Level II review (review) was previously completed by the Mine and submitted to DWQ as part the permit application information as required. The separate review concludes that the proposed increase in total effluent flow from the potential additional future mine dewatering is not only needed to continue safely operating the Mine, but is also the most practicable, feasible, and least polluting preferred treatment option. The WLA and ADR indicate that the effluent limitations and preferred treatment option as provided, respectively, will be sufficiently protective of water quality in order to meet Utah Water Quality Standards in the receiving waters. The WLA and ADR information are attached to this Fact Sheet as Addendum I.

The following list is the basis of the effluent limitations for the permit parameters:

- 1) Since the Mine discharge meets the EPA definition of “alkaline mine drainage,” the permittee is subject to the technology-based effluent limitations found in 40 CFR Part 434.45. Applicable technology-based limits included in the permit are as follows:
 - a. Total suspended solids (TSS) daily maximum limit of 70 mg/L.
 - b. For discharges composed of surface water, or mine water commingled with surface water, 40 CFR Part 434.63 allows alternate effluent limits to be applied when discharges result from specific runoff events, detailed below and in the permit (applicable only to Outfalls 002, 006, 007, 008 & 009). The Mine has the burden of proof that the following runoff events occurred as described further in the permit:
 - i. For runoff events (rainfall or snowmelt) less than or equal to a 10-year 24-hour precipitation event, settleable solids may be substituted for TSS and shall be limited to 0.5 milliliters per liter (ml/L). All other effluent limitations must be achieved concurrently, as described in the permit.
 - ii. For runoff events (rainfall or snowmelt) greater than a 10-year 24-hour precipitation event, the alternative pH limitations may only apply as described in the permit.
- 2) Daily minimum and daily maximum limitations on pH are derived from Utah Water Quality Standards found in UAC R317-2-14.
- 3) Total dissolved solids (TDS) are limited according to Utah Water Quality Standards (WQS) and policies established by the Colorado River Basin Salinity Control Forum. TDS are limited by both mass loading and concentration requirements as described below:
 - a. The effluent limit for TDS concentration is maintained from the previous permit and is more stringent than the limits determined by the current WLA. This is based upon BPJ of the permitting authority which also conforms with EPA anti-backsliding requirements as referenced in UAC R317-8-4.2(11). The current TDS concentration limit is based on the previous WLA and the site-specific WQS for Quitcupah Creek as previously mentioned in the TMDL section of the Fact Sheet.
 - b. Discharges from the Mine eventually reach the Colorado River, which places it in the guidance of the Colorado River Basin Salinity Control Forum (Forum) for TDS mass loading limitations. TDS mass loading is limited according to policies established by the Forum, as authorized in UAC R317-2-4 to further control salinity in the Utah portion of the Colorado River Basin. On February 28, 1977, the Forum produced the “*Policy For Implementation of Colorado River Salinity Standards Through the NPDES Permit Program*” (Policy), with the most current subsequent triennial revision dated October 2020. Forum Policy states that if a no-salt (i.e., no-TDS) discharge cannot be achieved, then the facility is limited to discharging one-ton per day of TDS unless a demonstration is made that it is not economically feasible and/or practicable to do so. Discharges from the Mine exceed the one-ton

per day TDS loading limitation guideline as set by the Forum, therefore a cost analysis of alternative plans was originally prepared by the Mine in response to the initial 1977 Policy and was completed in 1984. The analysis indicated that a zero discharge (no-salt) or one-ton per day discharge of TDS was not economically feasible or practical at that time considering the low production yields of the extraction system. Upon DWQ request, the Mine revisited the applicability of their exemption from the Forum Policy in 2006, 2012 and again in 2017 when the Mine was required to reevaluate and submit a justification to DWQ for exemption from the Forum Policy. The Mine made successful demonstrations to DWQ, the most recent in May of 2017, following the Forum Policy and was subsequently granted a continuing exemption to the TDS loading requirements based upon the feasibility and practicability analysis at that time and as previously provided. For this permit renewal, the Mine will be required to reevaluate and submit a justification demonstration, including but not limited to the purchase of salinity-offset credits, to DWQ within 2 years of from the effective date of the renewal permit. If the Mine can successfully demonstrate that the exemption should still be applicable, then the exemption will remain in the permit. Otherwise the Water Quality re-opener provision in the permit can be utilized and the permit modified to include a TDS loading limit and/or salinity-offset provisions as per Forum Policy. This will once again be reevaluated during future permit renewals as appropriate.

- 4) The limitation on total recoverable iron is maintained from the previous permit and also reflects upon past and current WLAs.
- 5) The Sulfate limitation is also derived from the current WLA to include assimilative capacity in the receiving waters.
- 6) Oil & Grease concentrations are limited to 10 mg/L based upon BPJ of the permitting authority to be consistent with other industrial facilities statewide.
- 7) The effluent flow limitation is based upon the total maximum design flow of the outfalls as provided by the Mine facility.

REASONABLE POTENTIAL ANALYSIS

Since January 1, 2016, DWQ has conducted a reasonable potential analysis (RP) on all new and renewal permit applications received after that date. RP is conducted following DWQ's "Reasonable Potential Analysis Guidance" dated September 10, 2015 (RP Guidance). There are four outcomes defined in the RP Guidance: Outcome A, B, C, or D. These Outcomes, as detailed further in the attached RP Analysis, provide a frame work for what routine monitoring or effluent limitations are appropriate.

An RP analysis was performed on all metal constituents and other permit parameters of concern (POCs) from the mine water discharges data via Outfalls 001 & 003 (no discharges from any other Outfalls). Initial screening values that were submitted through both the monthly discharge monitoring reports, as well as the permit renewal application information, showed that a closer look for RP was needed for cadmium, lead, mercury and selenium. Therefore, a more quantitative

RP was conducted on these four parameters using the RP model, which resulted in a reasonable potential to exceed both the acute and chronic criterion for cadmium and selenium, but with only the chronic criterion exceeded for lead and mercury.

Upon closer look at the data points used in the RP analyses, and since most of the elevated concentrations for all four metals parameters occurred early in 2020 upon mine dewatering startup operations, it could be concluded that these initial concentrations were not necessarily indicative of the quality of mine water as pumping operations may have not reached an equilibration and/or stabilization of the constituents as the next 70-80 sampling events would suggest (typically only 10-20 sampling data points are used for the RP analyses). Thereby removing the initial concentration outliers from the RP analyses resulted in no RP for both cadmium and lead.

Additionally, upon closer look of the effluent data, WQS, and each metal parameter's Method Detection Limit (MDL), it does not appear that sufficiently sensitive test methods and MDLs are being consistently utilized for all parameters. Specifically, for the same four metals: cadmium, lead, mercury and selenium. All of which would require more sensitive testing methods and lower MDLs in order to better evaluate RP for each of the respective Acute and/or Chronic WQS. More specifically, RP for the mercury and selenium chronic criterion could not be adequately determined with the existing data points and current MDLs. Therefore, more data points are needed utilizing the most sensitive laboratory MDLs to determine if RP actually exists for these metals.

Based upon the RP evaluation and summary information, the final RP determination was; *Outcome C: No new effluent limitation. Routine monitoring requirements maintained as they are in the permit*, but with utilizing sufficiently sensitive laboratory test methods and MDLs as appropriate. This will provide a better data set to be re-evaluated for RP during this next permit cycle. Once re-evaluated, the permit can be re-opened and modified as necessary to include any additional permit limitations as required and/or to remove any metal parameters from future monitoring as appropriate. The detailed RP Summary is included as an attachment at the end of this Fact Sheet.

The permittee is expected to be able to comply with the permit limitations for all Outfalls as follows:

Parameter	Effluent Limitations *a			
	Maximum Monthly Avg	Maximum Weekly Avg	Daily Minimum	Daily Maximum
Total Flow *b	3.0	--	--	--
TSS, mg/L	--	--	--	70
Sulfate, mg/L	--	--	--	3,209
TDS, mg/L *g	--	--	--	4,766
Oil & Grease, mg/L*c	--	--	--	10.0
pH, Standard Units	--	--	6.5	9.0
Total Iron, mg/L	--	--	--	1.4
WET Chronic Biomonitoring *d	--	--	--	IC ₂₅ > 57.6% effluent
Sanitary Waste *c	--	--	--	None
Turbidity *e	--	--	--	Report

SELF-MONITORING AND REPORTING REQUIREMENTS

The self-monitoring and reporting requirements, as included in the following table, are similar to the previous permit, with the addition of turbidity monitoring as previously mentioned. Sampling frequency is based on the Mine being a major industrial permit with a maximum design effluent flow of <10 MGD and is consistent with other similar coal mine UPDES permits. The permit will require reports to be submitted monthly and quarterly, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Effective January 1, 2017, monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception. Lab reports for biomonitoring and metals shall be attached to the applicable DMRs as appropriate.

Self-Monitoring and Reporting Requirements *a			
Parameter	Frequency	Sample Type	Units
Total Flow *b	Twice Monthly	Recorded	MGD
TSS	Twice Monthly	Grab	mg/L
pH	Twice Monthly	Grab	SU
Oil & Grease *c	Twice Monthly	Visual	Yes/No
Oil & Grease *c	When Sheen Observed	Grab	mg/L
TDS, mg/L *g	Twice Monthly	Composite	mg/L
Sulfate, mg/L	Twice Monthly	Composite	mg/L
Sanitary Waste *c	Twice Monthly	Visual	Yes/No
Turbidity *e	Twice Monthly	Grab	NTU
WET – Biomonitoring *d Ceriodaphnia dubia - Chronic Fathead Minnows - Chronic	Quarterly, Alternating Species each quarter when mine is discharging.	Composite	Pass/Fail
Total & Dissolved Metals *f	Quarterly	Grab	mg/L

*a See Permit *Part VII*, for definition of terms. Effluent limits apply to all outfalls unless otherwise stated.

*b Total Effluent Flow is limited to 3.0 MGD as a thirty-day average from all discharging outfalls combined. Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

*c A visual inspection for any oil and grease sheen, sanitary wastes, floating solids, and visible foam shall be performed at least twice per month at all Outfalls. There shall be no visible sheen, floating solids, or visible foam in other than trace amounts upon any discharges and there shall be no discharge of any sanitary wastes at any time. If a sheen is observed discharging from any Outfall, then a sample of the effluent shall be collected immediately thereafter and the oil and grease shall not exceed 10 mg/L in concentration.

*d Chronic WET monitoring is required for mine water discharges from Outfalls 001, 003, 004 and 005 only. The chronic WET testing shall alternate test species as detailed in the permit.

*e Turbidity monitoring shall be conducted twice monthly from all discharging Outfalls and from the receiving water whenever possible.

- *f Starting on the effective date of this permit, the following total and dissolved metals shall be monitored quarterly for at least two years and until at least 10 sampling events are completed from all discharging outfalls; Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Selenium, Silver and Zinc. The permittee is required to utilize the lowest detection limit possible using sufficiently sensitive standard test methods and certified laboratories. Once at least 10 sampling events have been completed, the permittee may request a permit modification based upon a subsequent reasonable potential analysis for a reduction in testing frequency and/or removal of any applicable metals parameters as appropriate. The permit issuing authority may approve or deny the request based on the results and other available information.
- *g Within two years from the effective date of this permit, the permittee shall complete and submit to the Director, a TDS loading evaluation and exemption demonstration report in accordance with the Colorado River Basin Salinity Control Forum NPDES Policies entitled, “2020 Review, Water Quality Standards for Salinity, Colorado River System, Appendix B.”

STORM WATER

As mentioned previously, the Storm Water provisions have been omitted from this UPDES permit. However, based on the type of industrial activities at the Mine facility, the permittee is required to maintain separate permit coverage, or an appropriate exclusion, under the UPDES Multi-Sector General Permit (MSGP) for Storm Water Discharges Associated with Industrial Activities (UTR000000). If the facility has not already done so, it has 30 days from the effective date of this permit to submit the appropriate Notice of Intent (NOI) for the MSGP, or exclusion documentation. Previously, storm water discharge requirements and coverage were combined in this individual permit. These have been separated to provide consistency among permittees, electronic reporting for storm water discharge monitoring reports, and increase flexibility to changing site conditions.

Permit coverage under the UPDES Construction General Storm Water Permit (CGP) is required for any construction at the facility that is not part of active mining activities and which disturb an acre or more of land, or is part of a common plan of development or sale that is an acre or greater. A Notice of Intent (NOI) is required to obtain a construction storm water permit prior to the period of construction. Information on storm water permit requirements can be found at <http://stormwater.utah.gov>.

PRETREATMENT REQUIREMENTS

The Mine does not discharge process wastewater to a Publicly Owned Treatment Works (POTW). Any process wastewater that the Mine may discharge to a POTW, either as a direct discharge or as a hauled waste, is subject to federal, state, and local pretreatment regulations. Pursuant to section 307 of the Clean Water Act, the Mine shall comply with all applicable federal general pretreatment regulations promulgated, found in 40 CFR 403, the pretreatment requirements found in UAC R317-8-8, and any specific local discharge limitations developed by the POTW accepting the

waste.

In addition, in accordance with 40 CFR 403.12(p)(1), the Mine must notify the POTW, the EPA Regional Waste Management Director, the DWQ Director and the State hazardous waste authorities in writing if the Mine discharges any substance into a POTW that if otherwise disposed of would be considered a hazardous waste under 40 CFR 261. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the *Utah Pollutant Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring)*, dated February 2018. Authority to require whole effluent toxicity (WET) biomonitoring is provided in Permit Conditions UAC R317-8-4.2, Permit Provisions UAC R317-8-5.3 and Water Quality Standards UAC R317-2-5 and UAC R317-2-7.2.

A review of the previous WET testing results indicates that the Mine has passed 7 of the past 8 quarterly chronic WET tests since mine water discharging commenced again in 2020, with the lone WET test failure being followed up by a passing WET test in the first half of 2021 and with no failed WET tests since that time. The permittee is classified as a major industrial facility and historical discharges from the Mine are from intercepted ground water and storm water only, which has not been a concern for the receiving waters due to the absence of toxicity. Therefore, the Mine will once again conduct chronic WET quarterly testing alternating the test species between *Ceriodaphnia dubia* and *Pimephales promelas* (fathead minnow) from the discharging mine water Outfalls as detailed in the permit. Chronic toxicity occurs when the inhibitory concentration to 25% of the population (IC₂₅) is less than or equal to the effluent concentrations as derived from the WLA and included in the permit. The IC₂₅ is the concentration of toxicant (given in % effluent) that would cause a 25% reduction in mean young per female or a 25% reduction in overall growth for the test population. The permit also contains the standard requirements for accelerated re-testing upon failure of a WET test, as appropriate.

Additionally, the permit will once again contain a toxicity limitation re-opener provision. This provision allows for modification of the permit at any time in the future to include additional WET limitations and/or monitoring, should additional information indicate the presence of toxicity in the discharge. The chronic WET testing provisions as well as the toxicity limitation re-opener provision are detailed further in the permit.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years, as authorized in UAC R317-8-5.1(1).

PERMIT DRAFTED & REVIEWED BY:

Jeff Studenka, Discharge Permit Writer
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
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(801) 536-4300
November 10, 2022

PUBLIC NOTICE INFORMATION (to be updated after)

Began: Month Day, Year
Ended: Month Day, Year

Comments will be received at: 195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

The Public Notice of the draft renewal permit shall be published on DWQ's website for at least 30 days as per Utah Administrative Code (UAC) R317-8-6.5. During the public comment period provided under UAC R317-8-6.5, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments will be considered in making the final decision and shall be answered as provided in UAC R317-8-6.12.

ADDENDUM TO FSSOB

ATTACHMENTS (2): I. Wasteload Analysis & Antidegradation Review
II. Reasonable Potential Analysis Summary & Effluent Discharge Data

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PND Draft

ATTACHMENT 1

*Wasteload Analysis
&
Antidegradation Review*

PND Draft

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ATTACHMENT 2

*Reasonable Potential Analysis
&
Effluent Discharge Data*

PND Draft

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REASONABLE POTENTIAL ANALYSIS SUMMARY

The Division of Water Quality (DWQ) has worked to improve the reasonable potential analysis (RP) for permit developments with the inclusion of additional limits and/or parameters as necessary by using an EPA provided RP model (model). As a result of the model, more parameters and/or limits may be included in the renewal permit. In the 2015 DWQ policy entitled, "Reasonable Potential Analysis Guidance" (RP Guide), there are four possible RP outcomes as follows;

- Outcome A: A new effluent limitation will be placed in the permit.
- Outcome B: No new effluent limitation. Routine monitoring requirements will be placed or increased from what they are in the permit,
- Outcome C: No new effluent limitation. Routine monitoring requirements maintained as they are in the permit,
- Outcome D: No limitation or routine monitoring requirements are in the permit.

2018-2022 Summary Results of Reasonable Potential Analysis for Bronco Mine Water Discharges UPDES Permit No. UT0022616 – Outfalls 001 & 003 (Mine Dewatering)

RP Parameter (Metals Dissolved Fraction)	No. of Samples	MEC* mg/L	Water Quality Standards MAC** (most stringent)		Outcome/Result
			Acute mg/L	Chronic mg/L	
Arsenic	>80	0.099	0.1735	0.1735	MEC < MAC***
Aluminum	34	0.4	1.0247	NA	MEC < MAC
Cadmium	>80	0.019	0.0133	0.00136	MEC > MAC****
Chromium (III&VI)	>80	0.01	8.388	0.523	MEC < MAC
Copper	>80	0.02	0.0778	0.0573	MEC < MAC
Lead	>80	0.11	0.1729	0.0363	MEC > MAC
Mercury	>80	0.000087	0.00026	0.000021	MEC > MAC
Nickel	>80	0.03	2.267	0.319	MEC < MAC
Selenium	>80	0.04	0.0268	0.0068	MEC > MAC
Silver	>80	0.05	0.0674	NA	MEC < MAC
Zinc	>80	0.17	0.58	0.58	MEC < MAC
Cyanide	>80	<0.002	0.0301	0.009	MEC < MAC
PERMIT Parameter			Permit Limits		
Total Iron	>90	10.5	1.4	NA	MEC >MAC
Total Suspended Solids	>90	130	70	NA	MEC > MAC
Total Dissolved Solids	>90	3078	4766	NA	MEC < MAC
Sulfate	>90	2960	3366	NA	MEC < MAC
pH (SU)	>90	7.14-8.65	6.5 (daily min)	9.0 (daily max)	MEC < MAC

Notes/Legend:

NA = not applicable, no limit criterion.

*MEC = Maximum Effluent Concentration as determined from existing data set and RP analysis.

**MAC = Maximum Allowable Concentration as derived from the applicable Utah Water Quality Standards (WQS), current Permit Limits and/or Wasteload Analysis.

***MEC < MAC = MEC less than MAC, no RP or additional limitations required.

****MEC > MAC = MEC greater than MAC triggering RP to exceed applicable limitations.

Summary: Following the RP Guide developed by the Utah Division of Water Quality on September 10, 2015 and subsequently implemented beginning January 1, 2016 for all new and renewal permits, a qualitative RP was conducted on all applicable permit parameters (see above table). From the summary table above, there were a total of six parameters (in **BOLD**) that resulted in further RP evaluation, however two of those parameters, Iron and TSS, already have the appropriate permit effluent limits and further RP analyses are not necessary. Leaving the following four parameters for further RP evaluation: cadmium, lead, mercury and selenium. Therefore, a more quantitative RP was conducted on these four parameters using the RP model, which resulted in a reasonable potential to exceed both the acute and chronic criterion for cadmium and selenium, but with only the chronic criterion exceeded for lead and mercury.

Upon closer look at the effluent data used in the RP model, 80 of the 85 data points for cadmium resulted in concentrations either below or only slightly above the laboratory method detection limit (MDL). Only 1 of the 5 elevated data points triggered RP for the cadmium acute criterion. This could be considered an outlier since it occurred upon early startup of mine dewatering operations in March 2020 and since there have been no concentrations above the applicable criterion since that time after 80 more sampling events. Removing this outlier resulted in no RP for cadmium.

Similarly, for total lead the last 70+ sampling events resulted in concentrations either below or only slightly above the MDL and with only 5 of the 85 total sampling events resulting in elevated data points triggering RP for the lead chronic criterion. These 5 data points could be considered outliers since they occurred upon early start up in 2020 and since there have been no concentrations above the criterion since that time after 70 or more sampling events. Removing these outliers resulted in no RP for lead.

Similar to the cadmium analyses, 80 of the 85 data points for mercury resulted in concentrations either below or only slightly above the MDL with the highest concentrations occurring in early 2020 upon initial startup of mine dewatering. The MDL for mercury is sufficiently sensitive for the acute criterion but not for the chronic criterion. Therefore, RP for mercury to exceed the chronic WQS could not be adequately determined at this time. The mercury RP analysis was evaluated using the dissolved fractions since the WQS criterion for mercury is based upon a dissolved standard.

For selenium, all 85 sampling events resulted in concentrations either below or only slightly above the MDL of 0.02 mg/L. This MDL is not sufficiently sensitive to evaluate RP for either the acute or chronic selenium criterion, as the applicable WQS criterion are either close to or less than the current MDL as tested (see above table). Therefore, a more definitive RP analyses could not be completed at this time.

Since most of the elevated concentrations for all four metals parameters occurred early in 2020 upon mine dewatering startup operations, it could be concluded that these initial concentrations were not necessarily indicative of the quality of mine water as pumping operations may have not reached an equilibration and/or stabilization of the constituents as the next 70-80 sampling events would suggest (typically only 10-20 sampling data points are used for the RP analyses). Thereby removing the initial concentration outliers would be appropriate in the RP analyses. Additionally, upon closer look of the effluent data, WQS, and each parameter MDL, it does not appear that sufficiently sensitive test methods and MDLs are being consistently utilized for all parameters. More specifically for Cadmium, Lead, Mercury and Selenium. All of which require more sensitive testing methods and lower MDLs in order to better evaluate RP for each of those respective Acute and/or Chronic WQS. Therefore, more data points are needed utilizing the most sensitive laboratory MDLs to determine if RP actually exists for these four metals.

Based upon this evaluation and the above summary information, the final RP determination was not to include any additional total metal effluent limits at this time, however, monitoring for all the metals parameters with concentrations above MDLs will remain in place utilizing sufficiently sensitive laboratory test methods as included in the permit. This will provide a better data set to be re-evaluated for RP during the next permit cycle as appropriate. Once re-evaluated, the permit can be re-opened and modified as necessary to include any additional permit limitations as required and/or to remove any metal parameters from future monitoring as appropriate.

Also based upon the above RP analyses summary table, both Aluminum (which was not part of the previous permit metals monitoring requirements) and Cyanide can be omitted from future quarterly metals monitoring as there is no RP for either constituent to exceed the applicable WQS criterion.

The result of the RP analysis is Outcome C: No new effluent limitation. Routine monitoring requirements maintained as they are in the permit utilizing sufficiently sensitive laboratory test methods and MDLs as appropriate.

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PND Draft

Effluent Discharge Data

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