Utah Division of Water Quality
Statement of Basis
ADDENDUM
Wasteload Analysis and Antidegradation Level I Review

Date: **April 12, 2021**

Prepared by: **Christopher L. Shope, PhD**
Standards and Technical Services Section

Facility: **Alton Coal Development, LLC**
UPDES No. UT0025992

Receiving water: **Kanab Creek; unnamed tributaries to Kanab Creek (2B, 3C, 4)**

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

All discharges are from sedimentation impoundments according to "Water Flow Line Drawing" in the renewal application.

Coal Hollow Mine
Outfall 001: Discharge from Pond 1 to Lower Robinson Creek to Kanab Creek; 0.326 MGD
Outfall 001B: Discharge from Pond 1B to Lower Robinson Creek to Kanab Creek; 0.016 MGD
Outfall 002: Discharge from Pond 2 to Lower Robinson Creek to Kanab Creek; 0.114 MGD
Outfall 003: Discharge from Pond 3 to Lower Robinson Creek to Kanab Creek; 0.294 MGD
Outfall 004: Discharge from Pond 4 to Sink Valley Wash to Kanab Creek; 0.342 MGD
North Private Lease
Outfall 005: Discharge from Pond 5 to April Creek to Kanab Creek; 0.033 MGD
Outfall 006: Discharge from Pond 6 to unnamed tributary to Kanab Creek; 0.026 MGD
Outfall 007: Discharge from Pond 7 to unnamed tributary to Kanab Creek; 0.203 MGD
Outfall 008: Discharge from Pond 8 to Kanab Creek; 0.117 MGD

The summation of all Outfall discharges is 1.471 MGD.

Receiving Water
The receiving water for Outfalls 001, 001B, 002, 003, 004, 005, 006, and 007 are intermittent tributaries to Kanab Creek. The receiving water for Outfall 008 is Kanab Creek.

Per UAC R317-2-13.2(b), the designated beneficial uses for Kanab Creek and tributaries, from state line to irrigation diversion at confluence with Reservoir Canyon: 2B, 3C, 4

- *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 are 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. Kanab Creek and tributaries above Simpson Hollow Wash to irrigation diversion at confluence with Reservoir Canyon: April through November, daily maximum 1,400 mg/l. Assessments shall be based on TDS concentrations measured in Kanab Creek.*

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Due to a lack of flow records for Kanab Creek, the 20th percentile of flow measurements was calculated on an annual basis. The source of flow data was a combination of flow data from DWQ sampling at station 4951940 Kanab Ck at County Rd Xing BL Alton (2013-2019), and DOGM sampling site SW1 (2005-2009).

Table 1: Annual critical low flow(cfs) for all Outfalls

Season	Kanab Ck at County Rd Xing BL Alton
Summer	0.03
Fall	0.80
Winter	3.00
Spring	0.40
Annual	**0.30**

The annual critical flow for Outfalls 001, 001B, 002, 003, 004, 005, 006, 007, and 008 were effectively considered to be zero as the receiving waters (tributaries to Kanab Creek and Kanab Creek proper) are intermittent and have no flow for parts of the year. Water quality based effluent limits for these outfalls revert to end-of-pipe water quality standards.

Kanab Creek water quality was characterized based on samples collected from DWQ sampling station 4951940. Results were compared against sample results from several USGS sampling locations upstream.

TMDL

According to the Utah's 2016 303(d) Water Quality Assessment Report dated December 7, 2016, the receiving water for the discharge, Kanab Creek and tributaries from state line to the

confluence with Fourmile Hollow near the White Cliffs to Reservoir Canyon (UT15010003-003_00) was listed as "Not Supporting" for Total Boron, Dissolved Selenium, and TDS with impaired beneficial uses 3C and 4.

DWQ has not completed a TMDL for Total Boron, Dissolved Selenium, or TDS in Kanab Creek and has set the development priority as "Low". TDS Limits are set at the standard of 1200 mg/l.

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

For the Outfalls, the effluent was consider to be totally mixed as the ratio of critical river flow to effluent discharge was 0.916 (<=2). Acute limits were calculated using 50% of the seasonal critical low flow. The annual critical flow for Outfalls 001, 001B, 002, 003, 004, 005, 006, 007, and 008 were effectively considered to be zero as the receiving waters (tributaries to Kanab Creek) are intermittent and have no flow for parts of the year. Water quality based effluent limits for these outfalls revert to end-of-pipe water quality standards and no mixing zone was considered.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were determined in consultation with the UPDES Permit Writer, the renewal application, and the industry SIC codes from https://www.osha.gov/data/sic-search. The potential parameters of concern identified for the discharge/receiving water were iron, TDS, TSS, and metals.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC_{50} is typically 100% effluent and does not need to be determined by the WLA.

Table 2: WET Limits for IC_{25} (all Outfalls)

Outfall	Percent Effluent
All Outfalls	86.3%

Wasteload Allocation Methods

Effluent limits were determined for conservative constituents using a simple mass balance mixing analysis (UDWQ, 2021). The mass balance analysis is summarized in the Wasteload Addendum.

The water quality standard for chronic ammonia toxicity is dependent on temperature and pH,

and the water quality standard for acute ammonia toxicity is dependent on pH. However, temperature and ammonia concentration of the effluent were not provided. The AMMTOX Model developed by University of Colorado and adapted by Utah DWQ and EPA Region VIII was used to determine ammonia effluent limits (Lewis et al., 2002). The analysis is summarized in the Wasteload Addendum.

Water quality models and supporting documentation are available for review upon request.

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload.

A Level II Antidegradation Review (ADR) is not required for this facility because the permittee is not requesting an increase in flow over that authorized in the existing permit.

Documents:

WLA Document: *Alton_Coal_WLA_2021.docx*
Wasteload Analysis and Addendums: *Alton_Coal_WLA_2021.xlsm*

References:

Lewis, B., J. Saunders, and M. Murphy. 2002. *Ammonia Toxicity Model (AMMTOX, Version2): A Tool for Determining Effluent Ammonia Limits*. University of Colorado, Center for Limnology.

Utah Division of Water Quality. 2021. *Utah Wasteload Analysis Procedures Version 2.0. https://documents.deq.utah.gov/water-quality/standards-technical-services/DWQ-2021-000684.pdf*

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Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA] = not included in the WLA
Addendum: Statement of Basis

12-Apr-21
4:00 PM

Facilities: **Alton Coal Development, Coal Hollow** **UPDES No: UT-0025992**
Discharging to: **Unnamed Trib. To Kanab Creek**

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

II. Receiving Water and Stream Classification

Unnamed Trib. To Kanab Creek: 2B,3C,4
Antidegradation Review: Level I review completed. Level II review is required.

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Maximum Total Dissolved Solids 1400.0 mg/l Background

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*	1 Hour Average (Acute) Standard Concentration		Load*
Aluminum	87.00	ug/l**	1.067 lbs/day	750.00	ug/l	9.199 lbs/day
Arsenic	150.00	ug/l	1.840 lbs/day	340.00	ug/l	4.170 lbs/day
Cadmium	2.40	ug/l	0.029 lbs/day	7.43	ug/l	0.091 lbs/day
Chromium III	269.65	ug/l	3.307 lbs/day	5641.68	ug/l	69.199 lbs/day
ChromiumVI	11.00	ug/l	0.135 lbs/day	16.00	ug/l	0.196 lbs/day
Copper	30.67	ug/l	0.376 lbs/day	52.00	ug/l	0.638 lbs/day
Iron				1000.00	ug/l	12.266 lbs/day
Lead	18.74	ug/l	0.230 lbs/day	480.78	ug/l	5.897 lbs/day
Mercury	0.0120	ug/l	0.000 lbs/day	2.40	ug/l	0.029 lbs/day
Nickel	169.47	ug/l	2.079 lbs/day	1524.29	ug/l	18.696 lbs/day
Selenium	4.60	ug/l	0.056 lbs/day	20.00	ug/l	0.245 lbs/day
Silver	N/A	ug/l	N/A lbs/day	41.53	ug/l	0.509 lbs/day
Zinc	389.97	ug/l	4.783 lbs/day	389.97	ug/l	4.783 lbs/day

* Allowed below discharge
**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO3

Metals Standards Based upon a Hardness of 402.61 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	0.06 lbs/day
Chromium			100.0 ug/l	lbs/day
Copper			200.0 ug/l	lbs/day
Lead			100.0 ug/l	lbs/day
Selenium			50.0 ug/l	lbs/day
TDS, Summer			1400.0 mg/l	8.59 tons/day

V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
Metals	**Concentration**	**Load***	**Concentration**	**Load***
Arsenic			ug/l	lbs/day
Barium			ug/l	lbs/day
Cadmium			ug/l	lbs/day
Chromium			ug/l	lbs/day
Lead			ug/l	lbs/day
Mercury			ug/l	lbs/day
Selenium			ug/l	lbs/day
Silver			ug/l	lbs/day
Fluoride (3)			ug/l	lbs/day
to			ug/l	lbs/day
Nitrates as N			ug/l	lbs/day

VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	53.39 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	2731.65 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.00 lbs/day
Nickel			4600.00 ug/l	57.12 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	0.08 lbs/day
Zinc				

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

(4) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

Flow, Q, (cfs or MGD)	D.O. mg/l
Temperature, Deg. C.	Total Residual Chlorine (TRC), mg/l
pH	Total NH3-N, mg/l
BOD5, mg/l	Total Dissolved Solids (TDS), mg/l
Metals, ug/l	Toxic Organics of Concern, ug/l

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Current Upstream Information

	Stream Critical Low Flow cfs	Temp. Deg. C	pH	T-NH3 mg/l as N	BOD5 mg/l	DO mg/l	TRC mg/l	TDS mg/l
Summer (Irrig. Season)	0.0	21.9	8.3	0.03	0.10	8.65	0.00	1092.5
Fall	0.8	4.7	8.4	0.04	0.10	---	0.00	846.2
Winter	3.0	3.1	8.5	0.02	0.10	---	0.00	846.2
Spring	0.4	16.2	8.6	0.02	0.10	---	0.00	846.2

Dissolved Metals	Al ug/l	As ug/l	Cd ug/l	CrIII ug/l	CrVI ug/l	Copper ug/l	Fe ug/l	Pb ug/l
All Seasons	1.59*	0.53*	0.053*	0.53*	2.65*	0.53*	0.0	25.63

Dissolved Metals	Hg ug/l	Ni ug/l	Se ug/l	Ag ug/l	Zn ug/l	Boron ug/l	
All Seasons	0.0000	0.53*	4.60	0.1*	0.053*	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	1.47100	NA	609.92	3.74053
Fall	1.47100	NA		
Winter	1.47100	NA		
Spring	1.47100	NA		

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

Season	Daily Average	
Summer	1.471 MGD	2.276 cfs
Fall	1.471 MGD	2.276 cfs
Winter	1.471 MGD	2.276 cfs
Spring	1.471 MGD	2.276 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 1.471 MGD. If the discharger is allowed to have a flow greater than 1.471 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

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Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not occur in downstream segements if the values below are met.

WET Requirements	LC50 >	EOP	Effluent	[Acute]
	IC25 >	98.8%	Effluent	[Chronic]

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	1403.8	mg/l	8.61	tons/day
Fall	Maximum, Acute	1406.8	mg/l	8.63	tons/day
Winter	Maximum, Acute	1411.1	mg/l	8.65	tons/day
Spring	4 Day Avg. - Chronic	1405.4	mg/l	8.62	tons/day

Colorado Salinity Forum Limits — Determined by Permitting Section

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 402.61 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		759.2	ug/l	9.3	lbs/day
Arsenic	151.84	ug/l	1.2	lbs/day	344.2	ug/l	4.2	lbs/day
Cadmium	2.43	ug/l	0.0	lbs/day	7.5	ug/l	0.1	lbs/day
Chromium III	272.96	ug/l	2.2	lbs/day	5,711.1	ug/l	70.1	lbs/day
Chromium VI	11.09	ug/l	0.1	lbs/day	16.1	ug/l	0.2	lbs/day
Copper	31.04	ug/l	0.2	lbs/day	52.6	ug/l	0.6	lbs/day
Iron	N/A		N/A		1,012.3	ug/l	12.4	lbs/day
Lead	18.65	ug/l	0.1	lbs/day	486.4	ug/l	6.0	lbs/day
Mercury	0.01	ug/l	0.0	lbs/day	2.4	ug/l	0.0	lbs/day
Nickel	171.55	ug/l	1.4	lbs/day	1,543.0	ug/l	18.9	lbs/day
Selenium	4.60	ug/l	0.0	lbs/day	20.2	ug/l	0.2	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	42.0	ug/l	0.5	lbs/day
Zinc	394.77	ug/l	3.1	lbs/day	394.8	ug/l	4.8	lbs/day
Cyanide	5.26	ug/l	0.0	lbs/day	22.3	ug/l	0.3	lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	23.9 Deg. C.	75.0 Deg. F
Fall	7.4 Deg. C.	45.3 Deg. F
Winter	7.7 Deg. C.	45.9 Deg. F
Spring	18.5 Deg. C.	65.4 Deg. F

Effluent Targets for Pollution Indicators Based upon Water Quality Standards

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

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	1 Hour Average Concentration		Loading	
Gross Beta (pCi/l)	50.0	pCi/L		
BOD (mg/l)	5.0	mg/l	61.3	lbs/day
Nitrates as N	4.0	mg/l	49.1	lbs/day
Total Phosphorus as P	0.05	mg/l	0.6	lbs/day
Total Suspended Solids	90.0	mg/l	1103.9	lbs/day

Note: Pollution indicator targets are for information purposes only.

Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)

In-stream criteria of downstream segments for Protection of Human Health [Toxics]
will be met with an effluent limit as follows:

	Maximum Concentration Concentration		Load	
Metals				
Antimony		ug/l		lbs/day
Arsenic		ug/l		lbs/day
Asbestos		ug/l		lbs/day
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper		ug/l		lbs/day
Cyanide		ug/l		lbs/day
Lead				
Mercury		ug/l		lbs/day
Nickel		ug/l		lbs/day
Selenium				
Silver				
Thallium		ug/l		lbs/day
Zinc				

Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rule

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		759.2				759.2	N/A
Antimony				4352.9		4352.9	
Arsenic	101.2	344.2			0.0	101.2	151.8
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	10.1	7.5			0.0	7.5	2.4
Chromium (III)		5711.1			0.0	5711.1	273.0
Chromium (VI)	101.2	16.1			0.0	16.15	11.09
Copper	202.5	52.6				52.6	31.0
Cyanide		22.3	222706.9			22.3	5.3
Iron		1012.3				1012.3	
Lead	100.9	486.4			0.0	100.9	18.7
Mercury		2.43		0.15	0.0	0.15	0.012

Nickel		1543.0	4656.6		1543.0	171.5
Selenium	50.6	20.2		0.0	20.2	4.6
Silver		42.0		0.0	42.0	
Thallium			6.4		6.4	
Zinc		394.8			394.8	394.8
Boron	759.2				759.2	

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]
[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

	WLA Acute ug/l	**WLA Chronic ug/l**	
Aluminum	759.2	N/A	
Antimony	4352.91		
Arsenic	101.2	151.8	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	7.5	2.4	
Chromium (III)	5711.1	273	
Chromium (VI)	16.1	11.1	
Copper	52.6	31.0	
Cyanide	22.3	5.3	
Iron	1012.3		
Lead	100.9	18.7	
Mercury	0.152	0.012	
Nickel	1543.0	172	
Selenium	20.2	4.6	
Silver	42.0	N/A	
Thallium	6.4		
Zinc	394.8	394.8	
Boron	759.23		

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determinec that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

The antidegradation rules and procedures allow for modification of effluent limits less than those based strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

An Antidegradation Level I Review was conducted on this discharge and its effect on the receiving water. Based upon that review, it has been determined that an Antidegradation Level II Review is not required.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.
This doesn't apply to facilities that do not discharge to the Colorado River Basin.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important down-stream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information. Permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations provided that the values in this wasteload analysis [TMDL] are not compromised. See special provisions in Utah Water Quality Standards for adjustments in the Total Dissolved Solids values based upon background concentration.

Utah Division of Water Quality
801-538-6052
File Name: Alton_Coal_WLA_2021.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
2.000	0.000	1.057	569.725	0.000	409.923	0.400	0.137

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	2.114	0.000	0.000	32.000	14.253

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.417

K1 CBOD {theta}	K2 Reaer. {theta}	K3 NH3 {theta}	K4 Open {theta}	K5 NH3 Loss {theta}	K6 NO2+3 {theta}	K(Cl) TRC {theta}	S Benthic {theta}
1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required.