


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

Date: November 1, 2018
Prepared by: Dave Wham 
Standards and Technical Services
Facility: Blue Sky Ranch WWTP
UPDES No. UT-0025763
Receiving water: Alexander Creek (1C, 2B, 3A, 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

Outfall 001: Alexander Creek => Silver Creek

The mean monthly design discharge is 0.039 MGD (0.06 cfs) for the facility.

Receiving Water

The receiving water for Outfall 001 Alexander Creek, a tributary of Silver Creek in the Weber River drainage.

Per UAC R317-2-13.4(a), the designated beneficial uses for Weber River and tributaries, from Stoddard diversion to headwaters (includes Silver Creek) is 1C, 2B, 3A and 4.

- *Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water*
- *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.*

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- *Class 3A - Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.*
- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

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 data, the 7Q10 flow was estimated by calculating the 20th percentile of available data. Alexander Creek flows were determined from DWQ monitoring station #4926700, Alexander Ck @ Highway Xing, for the period 2001-2002. The receiving water was characterized by samples collected from the same site and time period. This station is located downstream of the current discharge, however the data period predates construction of the WWTP.

The calculated annual low value is 0.31 cfs.

TMDL

According to DWQ's 303(d) Assessment, Silver Creek and tributaries from confluence with Weber River to headwaters (Assessment Unit UT16020101-020_00), is listed as impaired for:

Class 1C use - cadmium, nitrate, pH, and arsenic;

Class 2B use - pH;

Class 3A use - pH, dissolved oxygen, O/E bioassessment, cadmium, and zinc;

Class 4 use, cadmium, pH, and total dissolved solids.

As a result, effluent limits for these constituents should not exceed water quality standards at end of pipe (no mixing/available assimilative capacity) even though WLA calculations may allow higher limits.

Echo Reservoir (Assessment Unit ID UT-L-16020101-001_00), located downstream from the discharge is listed as impaired for the 3A use class for temperature, dissolved oxygen, and total phosphorus.

The Rockport Reservoir and Echo Reservoir Total Maximum Daily Load study was approved March 26, 2014. The TMDL limited Blue Sky Resort WWTP's total phosphorous load to 42 kg annually and 21 kg during the summer (April 1st - September 30th) and total nitrogen to 208 kg annually and 115 kg during the summer.

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. Mixing zone calculations indicate total mixing within these constraints. Acute limits were calculated using 50% of the seasonal critical low flow.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were total nitrogen, total phosphorous, TDS, pH, cadmium, nitrate, arsenic, dissolved oxygen, zinc, and TDS based on review of the past permit and the impairment status of the receiving water. Addition parameters of concern may become apparent as a result of reasonable potential analysis, technology based standards, or other factors as determined by the UPDES Permit Writer.

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 LC₅₀ (lethal concentration, 50%) percent effluent for acute toxicity and the IC₂₅ (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 LC₅₀ is typically 100% effluent and does not need to be determined by the WLA.

Table 1: WET Limits for IC₂₅

Outfall	Percent Effluent
Outfall 001	4.8%

Wasteload Allocation Methods

Effluent limits were determined for conservative constituents using a simple mass balance mixing analysis (UDWQ 2012). 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. 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.

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. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

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Documents:

WLA Document: *BlueSky_WLADoc_11-1-18.docx*

Wasteload Analysis and Addendum: *BlueSky_WLA_11-1-18.xls*

References:

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0*.

Utah Division of Water Quality. 2014. Rockport Reservoir and Echo Reservoir Total Maximum Daily Load Study. March 26, 2014.

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.

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WASTELOAD ANALYSIS [WLA]
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SUMMARY

Discharging Facility: Blue Sky Ranch
UPDES No: UT-0025763
Design Flow 0.04 MGD

Receiving Water: Alexander Creek=>Silver Creek

Stream Classification: 1C, 2B, 3A, 4

Stream Flows [cfs]:	1.20	Summer (July-Sept)	20th Percentile
	1.20	Fall (Oct-Dec)	20th Percentile
	1.20	Winter (Jan-Mar)	20th Percentile
	1.20	Spring (Apr-June)	20th Percentile
	2.5	Average	

Stream TDS Values:	202.0	Summer (July-Sept)	Average
	202.0	Fall (Oct-Dec)	Average
	202.0	Winter (Jan-Mar)	Average
	202.0	Spring (Apr-June)	Average

Effluent Limits:

Flow, MGD:	0.04	MGD	Design Flow
BOD, mg/l:	25.0	Summer	5.0 Indicator
Dissolved Oxygen, mg/l	5.0	Summer	6.5 30 Day Average
TNH3, Chronic, mg/l:	23.1	Summer	Varies Function of pH and Temperature
TDS, mg/l:	21049.8	Summer	1200.0

WQ Standard:

Modeling Parameters:

Acute River Width: 50.0%
Chronic River Width: 100.0%

Level 1 Antidegradation Level Completed: Level II Review not required.

Date: 10/15/2018

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WASTELOAD ANALYSIS [WLA]

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15-Oct-18

4:00 PM

Facilities: Blue Sky Ranch
Discharging to: Alexander Creek=>Silver Creek

UPDES No: UT-0025763

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 in terms 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

Alexander Creek=>Silver Creek:	1C, 2B, 3A, 4
Antidegradation Review:	Level I review completed. Level II review not required.

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	6.50 mg/l (30 Day Average) 5.00 mg/l (7Day Average) 4.00 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

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Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard		
	Concentration	Load*	Concentration		Load*
Aluminum	87.00 ug/l**	0.028 lbs/day	750.00	ug/l	0.244 lbs/day
Arsenic	190.00 ug/l	0.062 lbs/day	340.00	ug/l	0.111 lbs/day
Cadmium	0.40 ug/l	0.000 lbs/day	3.61	ug/l	0.001 lbs/day
Chromium III	131.57 ug/l	0.043 lbs/day	2752.61	ug/l	0.897 lbs/day
Chromium VI	11.00 ug/l	0.004 lbs/day	16.00	ug/l	0.005 lbs/day
Copper	14.51 ug/l	0.005 lbs/day	22.78	ug/l	0.007 lbs/day
Iron			1000.00	ug/l	0.326 lbs/day
Lead	6.14 ug/l	0.002 lbs/day	157.59	ug/l	0.051 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40	ug/l	0.001 lbs/day
Nickel	80.75 ug/l	0.026 lbs/day	726.32	ug/l	0.237 lbs/day
Selenium	4.60 ug/l	0.001 lbs/day	20.00	ug/l	0.007 lbs/day
Silver	N/A ug/l	N/A lbs/day	9.20	ug/l	0.003 lbs/day
Zinc	185.61 ug/l	0.060 lbs/day	185.61	ug/l	0.060 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 167.63 mg/l as CaCO₃

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard		
	Concentration	Load*	Concentration		Load*
Aldrin			1.500	ug/l	0.000 lbs/day
Chlordane	0.004 ug/l	0.029 lbs/day	1.200	ug/l	0.000 lbs/day
DDT, DDE	0.001 ug/l	0.007 lbs/day	0.550	ug/l	0.000 lbs/day
Dieldrin	0.002 ug/l	0.013 lbs/day	1.250	ug/l	0.000 lbs/day
Endosulfan	0.056 ug/l	0.380 lbs/day	0.110	ug/l	0.000 lbs/day
Endrin	0.002 ug/l	0.016 lbs/day	0.090	ug/l	0.000 lbs/day
Guthion			0.010	ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.026 lbs/day	0.260	ug/l	0.000 lbs/day
Lindane	0.080 ug/l	0.543 lbs/day	1.000	ug/l	0.000 lbs/day
Methoxychlor			0.030	ug/l	0.000 lbs/day
Mirex			0.010	ug/l	0.000 lbs/day
Parathion			0.040	ug/l	0.000 lbs/day
PCB's	0.014 ug/l	0.095 lbs/day	2.000	ug/l	0.001 lbs/day
Pentachlorophenol	13.00 ug/l	88.312 lbs/day	20.000	ug/l	0.007 lbs/day
Toxephene	0.0002 ug/l	0.001 lbs/day	0.7300	ug/l	0.000 lbs/day

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IV. Numeric Stream Standards for Protection of Agriculture

4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	Concentration	Load*
Arsenic		100.0 ug/l	lbs/day
Boron		750.0 ug/l	0.12 lbs/day
Cadmium		10.0 ug/l	0.00 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		1200.0 mg/l	0.20 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	Concentration	Load*
Arsenic		50.0 ug/l	0.340 lbs/day
Barium		1000.0 ug/l	6.793 lbs/day
Cadmium		10.0 ug/l	0.068 lbs/day
Chromium		50.0 ug/l	0.340 lbs/day
Lead		50.0 ug/l	0.340 lbs/day
Mercury		2.0 ug/l	0.014 lbs/day
Selenium		10.0 ug/l	0.068 lbs/day
Silver		50.0 ug/l	0.340 lbs/day
Fluoride (3)		1.4 ug/l	0.010 lbs/day
to		2.4 ug/l	0.016 lbs/day
Nitrates as N		10.0 ug/l	0.068 lbs/day

Chlorophenoxy Herbicides

2,4-D	100.0 ug/l	0.679 lbs/day
2,4,5-TP	10.0 ug/l	0.068 lbs/day
Endrin	0.2 ug/l	0.001 lbs/day
cyclohexane (Lindane)	4.0 ug/l	0.027 lbs/day
Methoxychlor	100.0 ug/l	0.679 lbs/day
Toxaphene	5.0 ug/l	0.034 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	
Toxic Organics	[2 Liters/Day for 70 Kg Person over 70 Yr.]	[6.5 g for 70 Kg Person over 70 Yr.]	
Acenaphthene	1200.00 ug/l	8.15 lbs/day	2700.0 ug/l
Acrolein	320.00 ug/l	2.17 lbs/day	780.0 ug/l
Acrylonitrile	0.06 ug/l	0.00 lbs/day	0.7 ug/l
Benzene	1.20 ug/l	0.01 lbs/day	71.0 ug/l
Benzidine	0.00012 ug/l	0.00 lbs/day	0.0 ug/l
Carbon tetrachloride	0.25 ug/l	0.00 lbs/day	4.4 ug/l
Chlorobenzene	680.00 ug/l	4.62 lbs/day	21000.0 ug/l
1,2,4-Trichlorobenzene			142.66 lbs/day
Hexachlorobenzene	0.00075 ug/l	0.00 lbs/day	0.0 ug/l
1,2-Dichloroethane	0.38 ug/l	0.00 lbs/day	99.0 ug/l

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1,1,1-Trichloroethane				
Hexachloroethane	1.90 ug/l	0.01 lbs/day	8.9 ug/l	0.06 lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	0.61 ug/l	0.00 lbs/day	42.0 ug/l	0.29 lbs/day
1,1,2,2-Tetrachloroethane	0.17 ug/l	0.00 lbs/day	11.0 ug/l	0.07 lbs/day
Chloroethane			0.0 ug/l	0.00 lbs/day
Bis(2-chloroethyl) ether	0.03 ug/l	0.00 lbs/day	1.4 ug/l	0.01 lbs/day
2-Chloroethyl vinyl ether	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
2-Chloronaphthalene	1700.00 ug/l	11.55 lbs/day	4300.0 ug/l	29.21 lbs/day
2,4,6-Trichlorophenol	2.10 ug/l	0.01 lbs/day	6.5 ug/l	0.04 lbs/day
p-Chloro-m-cresol			0.0 ug/l	0.00 lbs/day
Chloroform (HM)	5.70 ug/l	0.04 lbs/day	470.0 ug/l	3.19 lbs/day
2-Chlorophenol	120.00 ug/l	0.82 lbs/day	400.0 ug/l	2.72 lbs/day
1,2-Dichlorobenzene	2700.00 ug/l	18.34 lbs/day	17000.0 ug/l	115.48 lbs/day
1,3-Dichlorobenzene	400.00 ug/l	2.72 lbs/day	2600.0 ug/l	17.66 lbs/day
1,4-Dichlorobenzene	400.00 ug/l	2.72 lbs/day	2600.0 ug/l	17.66 lbs/day
3,3'-Dichlorobenzidine	0.04 ug/l	0.00 lbs/day	0.1 ug/l	0.00 lbs/day
1,1-Dichloroethylene	0.06 ug/l	0.00 lbs/day	3.2 ug/l	0.02 lbs/day
1,2-trans-Dichloroethylene	700.00 ug/l	4.76 lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dichlorophenol	93.00 ug/l	0.63 lbs/day	790.0 ug/l	5.37 lbs/day
1,2-Dichloropropane	0.52 ug/l	0.00 lbs/day	39.0 ug/l	0.26 lbs/day
1,3-Dichloropropylene	10.00 ug/l	0.07 lbs/day	1700.0 ug/l	11.55 lbs/day
2,4-Dimethylphenol	540.00 ug/l	3.67 lbs/day	2300.0 ug/l	15.62 lbs/day
2,4-Dinitrotoluene	0.11 ug/l	0.00 lbs/day	9.1 ug/l	0.06 lbs/day
2,6-Dinitrotoluene	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Diphenylhydrazine	0.04 ug/l	0.00 lbs/day	0.5 ug/l	0.00 lbs/day
Ethylbenzene	3100.00 ug/l	21.06 lbs/day	29000.0 ug/l	197.00 lbs/day
Fluoranthene	300.00 ug/l	2.04 lbs/day	370.0 ug/l	2.51 lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) ether	1400.00 ug/l	9.51 lbs/day	170000.0 ug/l	1154.84 lbs/day
Bis(2-chloroethoxy) methane	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Methylene chloride (HM)	4.70 ug/l	0.03 lbs/day	1600.0 ug/l	10.87 lbs/day
Methyl chloride (HM)	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Methyl bromide (HM)	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Bromoform (HM)	4.30 ug/l	0.03 lbs/day	360.0 ug/l	2.45 lbs/day
Dichlorobromomethane	0.27 ug/l	0.00 lbs/day	22.0 ug/l	0.15 lbs/day
Chlorodibromomethane	0.41 ug/l	0.00 lbs/day	34.0 ug/l	0.23 lbs/day
Hexachlorobutadiene(c)	0.44 ug/l	0.00 lbs/day	50.0 ug/l	0.34 lbs/day
Hexachlorocyclopentadiene	240.00 ug/l	1.63 lbs/day	17000.0 ug/l	115.48 lbs/day
Isophorone	8.40 ug/l	0.06 lbs/day	600.0 ug/l	4.08 lbs/day
Naphthalene				
Nitrobenzene	17.00 ug/l	0.12 lbs/day	1900.0 ug/l	12.91 lbs/day
2-Nitrophenol	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
4-Nitrophenol	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dinitrophenol	70.00 ug/l	0.48 lbs/day	14000.0 ug/l	95.10 lbs/day
4,6-Dinitro-o-cresol	13.00 ug/l	0.09 lbs/day	765.0 ug/l	5.20 lbs/day
N-Nitrosodimethylamine	0.00069 ug/l	0.00 lbs/day	8.1 ug/l	0.06 lbs/day
N-Nitrosodiphenylamine	5.00 ug/l	0.03 lbs/day	16.0 ug/l	0.11 lbs/day
N-Nitrosodi-n-propylamine	0.01 ug/l	0.00 lbs/day	1.4 ug/l	0.01 lbs/day
Pentachlorophenol	0.28 ug/l	0.00 lbs/day	8.2 ug/l	0.06 lbs/day

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Phenol	2.10E+04 ug/l	1.43E+02 lbs/day	4.6E+06 ug/l	3.12E+04 lbs/day
Bis(2-ethylhexyl)phthala	1.80 ug/l	0.01 lbs/day	5.9 ug/l	0.04 lbs/day
Butyl benzyl phthalate	3000.00 ug/l	20.38 lbs/day	5200.0 ug/l	35.32 lbs/day
Di-n-butyl phthalate	2700.00 ug/l	18.34 lbs/day	12000.0 ug/l	81.52 lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	23000.00 ug/l	156.24 lbs/day	120000.0 ug/l	815.18 lbs/day
Dimethyl phthlate	3.13E+05 ug/l	2.13E+03 lbs/day	2.9E+06 ug/l	1.97E+04 lbs/day
Benzo(a)anthracene (P/	0.0028 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(a)pyrene (PAH)	0.0028 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(b)fluoranthene (F	0.0028 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Benzo(k)fluoranthene (F	0.0028 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Chrysene (PAH)	0.0028 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Acenaphthylene (PAH)				
Anthracene (PAH)	9600.00 ug/l	65.21 lbs/day	0.0 ug/l	0.00 lbs/day
Dibenzo(a,h)anthracene	0.0028 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Indeno(1,2,3-cd)pyrene	0.0028 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Pyrene (PAH)	960.00 ug/l	6.52 lbs/day	11000.0 ug/l	74.73 lbs/day
Tetrachloroethylene	0.80 ug/l	0.01 lbs/day	8.9 ug/l	0.06 lbs/day
Toluene	6800.00 ug/l	46.19 lbs/day	200000 ug/l	1358.64 lbs/day
Trichloroethylene	2.70 ug/l	0.02 lbs/day	81.0 ug/l	0.55 lbs/day
Vinyl chloride	2.00 ug/l	0.01 lbs/day	525.0 ug/l	3.57 lbs/day
			0.0	0.00 lbs/day
Pesticides			0.0	0.00 lbs/day
Aldrin	0.0001 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Dieldrin	0.0001 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Chlordane	0.0006 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDT	0.0006 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDE	0.0006 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDD	0.0008 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
alpha-Endosulfan	0.9300 ug/l	0.01 lbs/day	2.0 ug/l	0.01 lbs/day
beta-Endosulfan	0.9300 ug/l	0.01 lbs/day	2.0 ug/l	0.01 lbs/day
Endosulfan sulfate	0.9300 ug/l	0.01 lbs/day	2.0 ug/l	0.01 lbs/day
Endrin	0.7600 ug/l	0.01 lbs/day	0.8 ug/l	0.01 lbs/day
Endrin aldehyde	0.7600 ug/l	0.01 lbs/day	0.8 ug/l	0.01 lbs/day
Heptachlor	0.0002 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Heptachlor epoxide				
PCB's				
PCB 1242 (Arochlor 124	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1254 (Arochlor 125	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1221 (Arochlor 122	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1232 (Arochlor 123	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1248 (Arochlor 124	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1260 (Arochlor 126	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1016 (Arochlor 101	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Pesticide				
Toxaphene	0.000750 ug/l	0.00	0.0 ug/l	0.00 lbs/day
Dioxin				
Dioxin (2,3,7,8-TCDD)	1.30E-08 ug/l	0.00 lbs/day	1.40E-08	0.00

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Metals

Antimony	14.0 ug/l	0.10 lbs/day		
Arsenic	50.0 ug/l	0.34 lbs/day	4300.00 ug/l	29.21 lbs/day
Asbestos	7.00E+06 ug/l	4.76E+04 lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	1.30E+03 ug/l	8.83 lbs/day	2.2E+05 ug/l	1494.50 lbs/day
Lead	700.0 ug/l	4.76 lbs/day		
Mercury			0.15 ug/l	0.00 lbs/day
Nickel			4600.00 ug/l	31.25 lbs/day
Selenium	0.1 ug/l	0.00 lbs/day		
Silver	610.0 ug/l	4.14 lbs/day		
Thallium			6.30 ug/l	0.04 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.

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(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	Temp.	pH	T-NH3	BOD5	DO	TRC	TDS
	cfs	Deg. C		mg/l as N	mg/l	mg/l	mg/l	mg/l
Summer (Irrig. Season)	1.20	15.6	8.5	0.10	1.00	7.11	0.00	202.0
Fall	1.20	7.0	8.4	0.10	1.00	---	0.00	202.0
Winter	1.20	1.9	8.3	0.10	1.00	---	0.00	202.0
Spring	1.20	10.4	8.3	0.10	1.00	---	0.00	202.0
Dissolved	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	2.385*	0.795*	0.0795*	0.795*	3.975*	0.8*	1.25*	0.795*
Dissolved	Hg	Ni	Se	Ag	Zn	Boron		
Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
All Seasons	0.0000	0.795*	1.59*	0.15*	0.0795*	1.59*	* ~80% MDL	

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Projected Discharge Information

Season	Flow, MGD	Temp.
Summer	0.03900	12.0
Fall	0.03900	12.0
Winter	0.03900	12.0
Spring	0.03900	12.0

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	0.039 MGD	0.060 cfs
Fall	0.039 MGD	0.060 cfs
Winter	0.039 MGD	0.060 cfs
Spring	0.039 MGD	0.060 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.039 MGD. If the discharger is allowed to have a flow greater than 0.039 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occurring, the permit writers must include the discharge flow limitation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 >	100.0% Effluent	[Acute]
	IC25 >	4.8% Effluent	[Chronic]

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Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

Season	Concentration	
Summer	25.0 mg/l as BOD5	8.1 lbs/day
Fall	25.0 mg/l as BOD5	8.1 lbs/day
Winter	25.0 mg/l as BOD5	8.1 lbs/day
Spring	25.0 mg/l as BOD5	8.1 lbs/day

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

Season	Concentration
Summer	5.00
Fall	5.00
Winter	5.00
Spring	5.00

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

Season		Concentration	Load	
Summer	4 Day Avg. - Chronic	23.06 mg/l as N	7.5	lbs/day
	1 Hour Avg. - Acute	21.3 mg/l as N	6.9	lbs/day
Fall	4 Day Avg. - Chronic	30.2 mg/l as N	9.8	lbs/day
	1 Hour Avg. - Acute	25.5 mg/l as N	8.3	lbs/day
Winter	4 Day Avg. - Chronic	31.1 mg/l as N	10.1	lbs/day
	1 Hour Avg. - Acute	25.8 mg/l as N	8.4	lbs/day
Spring	4 Day Avg. - Chronic	27.2 mg/l as N	8.8	lbs/day
	1 Hour Avg. - Acute	23.1 mg/l as N	7.5	lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50. %.

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Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

Season		Concentration		Load	
Summer	4 Day Avg. - Chronic	0.210	mg/l	0.07	lbs/day
	1 Hour Avg. - Acute	0.198	mg/l	0.06	lbs/day
Fall	4 Day Avg. - Chronic	0.210	mg/l	0.07	lbs/day
	1 Hour Avg. - Acute	0.198	mg/l	0.06	lbs/day
Winter	4 Day Avg. - Chronic	0.210	mg/l	0.07	lbs/day
	1 Hour Avg. - Acute	0.198	mg/l	0.06	lbs/day
Spring	4 Day Avg. - Chronic	0.210	mg/l	0.07	lbs/day
	1 Hour Avg. - Acute	0.198	mg/l	0.06	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	21049.8	mg/l	3.42	tons/day
Fall	Maximum, Acute	21049.8	mg/l	3.42	tons/day
Winter	Maximum, Acute	21049.8	mg/l	3.42	tons/day
Spring	Maximum, Acute	21049.8	mg/l	3.42	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 167.63 mg/l):

	4 Day Average		1 Hour Average		
	Concentration	Load	Concentration		Load
Aluminum*	N/A	N/A	8,184.9	ug/l	2.7 lbs/day
Arsenic*	3,953.21 ug/l	0.8 lbs/day	3,713.3	ug/l	1.2 lbs/day
Cadmium	6.71 ug/l	0.0 lbs/day	38.7	ug/l	0.0 lbs/day
Chromium III	2,732.54 ug/l	0.6 lbs/day	30,118.8	ug/l	9.8 lbs/day
Chromium VI*	150.72 ug/l	0.0 lbs/day	135.6	ug/l	0.0 lbs/day
Copper	287.20 ug/l	0.1 lbs/day	241.4	ug/l	0.1 lbs/day
Iron*	N/A	N/A	659.6	ug/l	0.2 lbs/day
Lead	112.47 ug/l	0.0 lbs/day	1,716.9	ug/l	0.6 lbs/day
Mercury*	0.25 ug/l	0.0 lbs/day	26.3	ug/l	0.0 lbs/day
Nickel	1,671.08 ug/l	0.4 lbs/day	7,941.5	ug/l	2.6 lbs/day
Selenium*	64.47 ug/l	0.0 lbs/day	203.1	ug/l	0.1 lbs/day
Silver	N/A ug/l	N/A lbs/day	100.7	ug/l	0.0 lbs/day

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Zinc	3,875.75 ug/l	0.8 lbs/day	2,030.7	ug/l	0.7 lbs/day
Cyanide*	108.63 ug/l	0.0 lbs/day	240.8	ug/l	0.1 lbs/day

*Limits for these metals are based on the dissolved standard.

**Effluent Limitations for Heat/Temperature based upon
Water Quality Standards**

Summer	57.4 Deg. C.	135.2 Deg. F
Fall	48.7 Deg. C.	119.7 Deg. F
Winter	43.7 Deg. C.	110.7 Deg. F
Spring	52.2 Deg. C.	125.9 Deg. F

**Effluent Limitations for Organics [Pesticides]
Based upon Water Quality Standards**

In-stream criteria of downstream segments for Organics [Pesticides]
will be met with an effluent limit as follows:

	4 Day Average		1 Hour Average	
	Concentration	Load	Concentration	Load
Aldrin			1.5E+00 ug/l	7.56E-04 lbs/day
Chlordane	4.30E-03 ug/l	1.40E-03 lbs/day	1.2E+00 ug/l	6.05E-04 lbs/day
DDT, DDE	1.00E-03 ug/l	3.25E-04 lbs/day	5.5E-01 ug/l	2.77E-04 lbs/day
Dieldrin	1.90E-03 ug/l	6.18E-04 lbs/day	1.3E+00 ug/l	6.30E-04 lbs/day
Endosulfan	5.60E-02 ug/l	1.82E-02 lbs/day	1.1E-01 ug/l	5.54E-05 lbs/day
Endrin	2.30E-03 ug/l	7.48E-04 lbs/day	9.0E-02 ug/l	4.54E-05 lbs/day
Guthion	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02 ug/l	5.04E-06 lbs/day
Heptachlor	3.80E-03 ug/l	1.24E-03 lbs/day	2.6E-01 ug/l	1.31E-04 lbs/day
Lindane	8.00E-02 ug/l	2.60E-02 lbs/day	1.0E+00 ug/l	5.04E-04 lbs/day
Methoxychlor	0.00E+00 ug/l	0.00E+00 lbs/day	3.0E-02 ug/l	1.51E-05 lbs/day
Mirex	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02 ug/l	5.04E-06 lbs/day
Parathion	0.00E+00 ug/l	0.00E+00 lbs/day	4.0E-02 ug/l	2.02E-05 lbs/day
PCB's	1.40E-02 ug/l	4.55E-03 lbs/day	2.0E+00 ug/l	1.01E-03 lbs/day
Pentachlorophenol	1.30E+01 ug/l	4.23E+00 lbs/day	2.0E+01 ug/l	1.01E-02 lbs/day
Toxephene	2.00E-04 ug/l	6.50E-05 lbs/day	7.3E-01 ug/l	3.68E-04 lbs/day

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**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:

	1 Hour Average	
	Concentration	Loading
Gross Beta (pCi/l)	50.0 pCi/L	
BOD (mg/l)	5.0 mg/l	1.6 lbs/day
Nitrates as N	4.0 mg/l	1.3 lbs/day
Total Phosphorus as P	0.05 mg/l	0.0 lbs/day
Total Suspended Solids	90.0 mg/l	29.3 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
Toxic Organics		
Acenaphthene	2.51E+04 ug/l	8.15E+00 lbs/day
Acrolein	6.68E+03 ug/l	2.17E+00 lbs/day
Acrylonitrile	1.23E+00 ug/l	4.01E-04 lbs/day
Benzene	2.51E+01 ug/l	8.15E-03 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	5.22E+00 ug/l	1.70E-03 lbs/day
Chlorobenzene	1.42E+04 ug/l	4.62E+00 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	1.57E-02 ug/l	5.09E-06 lbs/day
1,2-Dichloroethane	7.94E+00 ug/l	2.58E-03 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	3.97E+01 ug/l	1.29E-02 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	1.27E+01 ug/l	4.14E-03 lbs/day
1,1,2,2-Tetrachloroethane	3.55E+00 ug/l	1.15E-03 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	6.48E-01 ug/l	2.11E-04 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	3.55E+04 ug/l	1.15E+01 lbs/day
2,4,6-Trichlorophenol	4.39E+01 ug/l	1.43E-02 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	1.19E+02 ug/l	3.87E-02 lbs/day
2-Chlorophenol	2.51E+03 ug/l	8.15E-01 lbs/day
1,2-Dichlorobenzene	5.64E+04 ug/l	1.83E+01 lbs/day
1,3-Dichlorobenzene	8.36E+03 ug/l	2.72E+00 lbs/day

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1,4-Dichlorobenzene	8.36E+03 ug/l	2.72E+00 lbs/day
3,3'-Dichlorobenzidine	8.36E-01 ug/l	2.72E-04 lbs/day
1,1-Dichloroethylene	1.19E+00 ug/l	3.87E-04 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	1.94E+03 ug/l	6.32E-01 lbs/day
1,2-Dichloropropane	1.09E+01 ug/l	3.53E-03 lbs/day
1,3-Dichloropropylene	2.09E+02 ug/l	6.79E-02 lbs/day
2,4-Dimethylphenol	1.13E+04 ug/l	3.67E+00 lbs/day
2,4-Dinitrotoluene	2.30E+00 ug/l	7.47E-04 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	8.36E-01 ug/l	2.72E-04 lbs/day
Ethylbenzene	6.48E+04 ug/l	2.11E+01 lbs/day
Fluoranthene	6.27E+03 ug/l	2.04E+00 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	2.92E+04 ug/l	9.51E+00 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	9.82E+01 ug/l	3.19E-02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	8.98E+01 ug/l	2.92E-02 lbs/day
Dichlorobromomethane(HM)	5.64E+00 ug/l	1.83E-03 lbs/day
Chlorodibromomethane (HM)	8.56E+00 ug/l	2.79E-03 lbs/day
Hexachlorocyclopentadiene	5.01E+03 ug/l	1.63E+00 lbs/day
Isophorone	1.75E+02 ug/l	5.71E-02 lbs/day
Naphthalene		
Nitrobenzene	3.55E+02 ug/l	1.15E-01 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	1.46E+03 ug/l	4.76E-01 lbs/day
4,6-Dinitro-o-cresol	2.72E+02 ug/l	8.83E-02 lbs/day
N-Nitrosodimethylamine	1.44E-02 ug/l	4.69E-06 lbs/day
N-Nitrosodiphenylamine	1.04E+02 ug/l	3.40E-02 lbs/day
N-Nitrosodi-n-propylamine	1.04E-01 ug/l	3.40E-05 lbs/day
Pentachlorophenol	5.85E+00 ug/l	1.90E-03 lbs/day
Phenol	4.39E+05 ug/l	1.43E+02 lbs/day
Bis(2-ethylhexyl)phthalate	3.76E+01 ug/l	1.22E-02 lbs/day
Butyl benzyl phthalate	6.27E+04 ug/l	2.04E+01 lbs/day
Di-n-butyl phthalate	5.64E+04 ug/l	1.83E+01 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	4.80E+05 ug/l	1.56E+02 lbs/day
Dimethyl phthlate	6.54E+06 ug/l	2.13E+03 lbs/day
Benzo(a)anthracene (PAH)	5.85E-02 ug/l	1.90E-05 lbs/day
Benzo(a)pyrene (PAH)	5.85E-02 ug/l	1.90E-05 lbs/day
Benzo(b)fluoranthene (PAH)	5.85E-02 ug/l	1.90E-05 lbs/day
Benzo(k)fluoranthene (PAH)	5.85E-02 ug/l	1.90E-05 lbs/day
Chrysene (PAH)	5.85E-02 ug/l	1.90E-05 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	5.85E-02 ug/l	1.90E-05 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	5.85E-02 ug/l	1.90E-05 lbs/day

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Pyrene (PAH)	2.01E+04 ug/l	6.52E+00 lbs/day
Tetrachloroethylene	1.67E+01 ug/l	5.43E-03 lbs/day
Toluene	1.42E+05 ug/l	4.62E+01 lbs/day
Trichloroethylene	5.64E+01 ug/l	1.83E-02 lbs/day
Vinyl chloride	4.18E+01 ug/l	1.36E-02 lbs/day

Pesticides

Aldrin	2.72E-03 ug/l	8.83E-07 lbs/day
Dieldrin	2.92E-03 ug/l	9.51E-07 lbs/day
Chlordane	1.19E-02 ug/l	3.87E-06 lbs/day
4,4'-DDT	1.23E-02 ug/l	4.01E-06 lbs/day
4,4'-DDE	1.23E-02 ug/l	4.01E-06 lbs/day
4,4'-DDD	1.73E-02 ug/l	5.64E-06 lbs/day
alpha-Endosulfan	1.94E+01 ug/l	6.32E-03 lbs/day
beta-Endosulfan	1.94E+01 ug/l	6.32E-03 lbs/day
Endosulfan sulfate	1.94E+01 ug/l	6.32E-03 lbs/day
Endrin	1.59E+01 ug/l	5.16E-03 lbs/day
Endrin aldehyde	1.59E+01 ug/l	5.16E-03 lbs/day
Heptachlor	4.39E-03 ug/l	1.43E-06 lbs/day
Heptachlor epoxide		

PCB's

PCB 1242 (Arochlor 1242)	9.19E-04 ug/l	2.99E-07 lbs/day
PCB-1254 (Arochlor 1254)	9.19E-04 ug/l	2.99E-07 lbs/day
PCB-1221 (Arochlor 1221)	9.19E-04 ug/l	2.99E-07 lbs/day
PCB-1232 (Arochlor 1232)	9.19E-04 ug/l	2.99E-07 lbs/day
PCB-1248 (Arochlor 1248)	9.19E-04 ug/l	2.99E-07 lbs/day
PCB-1260 (Arochlor 1260)	9.19E-04 ug/l	2.99E-07 lbs/day
PCB-1016 (Arochlor 1016)	9.19E-04 ug/l	2.99E-07 lbs/day

Pesticide

Toxaphene	1.52E-02 ug/l	4.96E-06 lbs/day
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Metals

Antimony	292.45 ug/l	0.10 lbs/day
Arsenic	1028.67 ug/l	0.33 lbs/day
Asbestos	1.46E+08 ug/l	4.76E+04 lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	27156.50 ug/l	8.83 lbs/day
Cyanide	14622.73 ug/l	4.76 lbs/day
Lead	0.00	0.00
Mercury	2.92 ug/l	0.00 lbs/day
Nickel	12742.66 ug/l	4.14 lbs/day
Selenium	0.00	0.00
Silver	0.00	0.00
Thallium	35.51 ug/l	0.01 lbs/day
Zinc		

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Dioxin

Dioxin (2,3,7,8-TCDD)

2.72E-07 ug/l

8.83E-11 lbs/day

**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		8184.9				8184.9	N/A
Antimony			292.5	89825.3		292.5	
Arsenic	2089.0	3713.3	1028.7			1028.7	3953.2
Barium					20889.6	20889.6	
Beryllium						0.0	
Cadmium	207.3	38.7				38.7	6.7
Chromium (III)		30118.8				30118.8	2732.5
Chromium (VI)	2073.1	135.6				135.59	150.72
Copper	4162.1	241.4	27156.5			241.4	287.2
Cyanide		240.8	4595714.8			240.8	108.6
Iron		659.6				659.6	
Lead	2073.1	1716.9				1716.9	112.5
Mercury		26.27	2.9	3.13		2.92	0.250
Nickel		7941.5	12742.7	96092.2		7941.5	1671.1
Selenium	1012.9	203.1				203.1	64.5
Silver		100.7				100.7	
Thallium			35.5	131.6		35.5	
Zinc		2030.7				2030.7	3875.8
Boron	15667.2					15667.2	
Sulfate	41779.2					41779.2	

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	8184.9	N/A	
Antimony	292.45		
Arsenic	1028.7	3953.2	Acute Controls
Asbestos	1.46E+08		
Barium			
Beryllium			
Cadmium	38.7	6.7	
Chromium (III)	30118.8	2733	
Chromium (VI)	135.6	150.7	Acute Controls
Copper	241.4	287.2	Acute Controls

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Cyanide	240.8	108.6	
Iron	659.6		
Lead	1716.9	112.5	
Mercury	2.924	0.250	
Nickel	7941.5	1671	
Selenium	203.1	64.5	
Silver	100.7	N/A	
Thallium	35.5		
Zinc	2030.7	3875.8	Acute Controls
Boron	15667.21		
Sulfate	41779.2		N/A at this Waterbody

Other Effluent Limitations are based upon R317-1.

E. coli 126.0 organisms per 100 ml

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined 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.

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. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

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.

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 downstream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.