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

Date: **November 15, 2018**

Prepared by: **Dave Wham**
Standards and Technical Services

Facility: **East Canyon Water Reclamation Facility (ECWRF)**
UPDES No. UT-0020001

Receiving water: **East Canyon 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: East Canyon Creek

The mean monthly design discharge is 4.0 MGD (6.2 cfs) for the facility.

Receiving Water
The receiving water for Outfall 001 is East Canyon Creek.

Per UAC R317-2-13.4, the designated beneficial uses for Weber River and tributaries, from Stoddard diversion to headwaters 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.*

- *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). East Canyon flows were determined from USGS station 10133800 (East Canyon Creek near Jeremy Ranch) for the period 2001-2018. This station is located immediately downstream of the ECWRF discharge, so an estimate of upstream daily flow values was calculated by subtracting ECWRF daily average flows from average daily flow values reported by USGS. Flow values from the summers of 2001- 2003 were excluded from the analysis because illegal withdrawals from East Canyon Creek led to atypical low flow values during this period. The calculated 7Q10 low flow values are listed in Table 1.

Table 1: Seasonal critical low flow (cfs)

Season	East Canyon Creek above ECWRF
Summer (July-Sept)	1.93
Fall (Oct –Dec)	4.23
Winter (Jan-Mar)	5.73
Spring (Apr –June)	6.01

East Canyon Creek water quality for pH and temperature (mixed condition) were characterized by continuous data from USGS station 10133800 (2007 -2018). All other constituents were based on samples collected from DWQ monitoring station 4925260, East Canyon Creek above East Canyon WWTP for the period 2006-2016.

TMDL

East Canyon Creek and tributaries from East Canyon Reservoir to headwaters (East Canyon Creek-2; UT16020102-026) are listed as impaired on the 2016 303(d) list for biological impairment, temperature, and total phosphorous (TP) for the Class 3A cold water aquatic life use; and total dissolved solids (TDS) for the Class 4 agricultural use. A TMDL addressing the TP impairment was completed for East Canyon Creek and Reservoir on September 14th, 2010 (UDWQ 2010). The TMDL identified an annual load limit of 895 kg applied to ECWRF for TP.

An investigation of the TDS impairment in East Canyon Creek was conducted by DWQ from 2015-2017 (DWQ 2018). Multiple sites were sampled and assessed throughout the watershed for the study. These data demonstrate that the water quality standard for TDS is being met in the headwater tributaries and on the main stem of East Canyon Creek sites all the way to East Canyon Reservoir. The study found two previously unassessed tributaries (Murnin Creek and Toll Canyon Creek) that exceed the standard.

East Canyon Creek was initially listed on the 2014 303(d) list for TDS based on exceedances at the USGS Gage below I-80 Rest Stop (MLID #4925370). After 2014, sample collection for this location was moved downstream. This was in part due to the landowner withdrawing access

permission, but DWQ also determined that the site was not representative of East Canyon Creek stream conditions. Site concerns included the intermittent nature of the stream at this location, and that it was located directly adjacent to a chain- up pullout on I-80. Runoff from the pullout area unduly influenced samples taken at the site. The sample site was relocated approximately ¼ mile downstream and named East Canyon Creek below the confluence with Kimball Creek. The monitoring location identification (MLID) was not changed. Data from the new location show no exceedances of the 1200 mg/l TDS criteria. TDS values range from 392-768 mg/l with a mean value of 558 mg/l (n=12).

Because the main stem of East Canyon Creek is meeting its class 4 beneficial use, DWQ anticipates delisting the main stem of East Canyon Creek in the 2020 Integrated Report and splitting the impaired tributaries into their own assessment units.

In the analysis of this WLA, data from DWQ monitoring station 4925260 (East Canyon Creek above East Canyon WWTP) showed no impairment for TDS. TDS values ranged from 268 – 886 mg/l with a mean value of 559 mg/l (n=46). Additionally, no TDS impairments were found below this point on either East Canyon Creek or the Weber River. These findings, coupled with the results of the East Canyon Creek TDS study confirm that there is available assimilative capacity available for TDS in the receiving water.

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.

Since the receiving water low flow (1.93 cfs) is equal to or less than twice the flow of a point source discharge (6.2 cfs), the combined flows are considered to be totally mixed. 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 ammonia, TDS, and total phosphorous 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 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 3: WET Limits for IC_{25}

Outfall	Percent Effluent
Outfall 001	76.2

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.

Effluent limits for total phosphorous are based on the approved East Canyon Creek and Reservoir TMDL (UDWQ 2010).

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 required for this facility because it discharges to a 1C drinking water source as outlined in R317-2-3.5d.

Documents:

WLA Document: *EastCanyon WWTPDoc_11-15-18.docx*
Wasteload Analysis and Addendum: *EastCanyonWWTP_WLA_11-15-18.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. 2010. East Canyon Creek and Reservoir TMDL. SWCA Environmental Consultants.

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

Utah Division of Water Quality. 2018. East Canyon Creek Delisting Document for TDS. Results of Investigation of TDS Impairments in East Canyon Creek, Park City area, Utah.

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility:	**East Canyon WRF**			
UPDES No:	UT-0020001			
Design Flow	4.00	MGD		

Receiving Water:	**ECWRF_WLA_11-13-18xls**		
Stream Classification:	1C, 2B, 3A, 4		
Stream Flows [cfs]:	1.93	Summer (July-Sept)	20th Percentile
	4.23	Fall (Oct-Dec)	20th Percentile
	5.73	Winter (Jan-Mar)	20th Percentile
	6.01	Spring (Apr-June)	20th Percentile
	0.0	Average	
Stream TDS Values:	523.0	Summer (July-Sept)	Average
	616.0	Fall (Oct-Dec)	Average
	694.0	Winter (Jan-Mar)	Average
	433.0	Spring (Apr-June)	Average

Effluent Limits:				**WQ Standard:**
Flow, MGD:	4.00	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:	5.1	Summer	Varies	Function of pH and Temperature
TDS, mg/l:	1411.2	Summer	1200.0	

Modeling Parameters:

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

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

Date: 11/13/2018

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis

13-Nov-18
4:00 PM

Facilities: East Canyon WRF
Discharging to: ECWRF_WLA_11-13-18xls

UPDES No: UT-0020001

THIS IS A DRAFT DOCUMENT

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

East Canyon 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

Utah Division of Water Quality
Salt Lake City, Utah

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**	2.907 lbs/day	750.00 ug/l	25.064 lbs/day
Arsenic	190.00 ug/l	6.349 lbs/day	340.00 ug/l	11.362 lbs/day
Cadmium	0.67 ug/l	0.022 lbs/day	7.39 ug/l	0.247 lbs/day
Chromium III	234.55 ug/l	7.838 lbs/day	4907.18 ug/l	163.988 lbs/day
ChromiumVI	11.00 ug/l	0.368 lbs/day	16.00 ug/l	0.535 lbs/day
Copper	26.52 ug/l	0.886 lbs/day	44.29 ug/l	1.480 lbs/day
Iron			1000.00 ug/l	33.418 lbs/day
Lead	15.08 ug/l	0.504 lbs/day	387.07 ug/l	12.935 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40 ug/l	0.080 lbs/day
Nickel	146.73 ug/l	4.903 lbs/day	1319.76 ug/l	44.104 lbs/day
Selenium	4.60 ug/l	0.154 lbs/day	20.00 ug/l	0.668 lbs/day
Silver	N/A ug/l	N/A lbs/day	30.99 ug/l	1.036 lbs/day
Zinc	337.57 ug/l	11.281 lbs/day	337.57 ug/l	11.281 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 339.57 mg/l as CaCO3

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard Concentration	Load*	1 Hour Average (Acute) Standard Concentration	Load*
Aldrin			1.500 ug/l	0.050 lbs/day
Chlordane	0.004 ug/l	0.188 lbs/day	1.200 ug/l	0.040 lbs/day
DDT, DDE	0.001 ug/l	0.044 lbs/day	0.550 ug/l	0.018 lbs/day
Dieldrin	0.002 ug/l	0.083 lbs/day	1.250 ug/l	0.042 lbs/day
Endosulfan	0.056 ug/l	2.450 lbs/day	0.110 ug/l	0.004 lbs/day
Endrin	0.002 ug/l	0.101 lbs/day	0.090 ug/l	0.003 lbs/day
Guthion			0.010 ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.166 lbs/day	0.260 ug/l	0.009 lbs/day
Lindane	0.080 ug/l	3.500 lbs/day	1.000 ug/l	0.033 lbs/day
Methoxychlor			0.030 ug/l	0.001 lbs/day
Mirex			0.010 ug/l	0.000 lbs/day
Parathion			0.040 ug/l	0.001 lbs/day
PCB's	0.014 ug/l	0.613 lbs/day	2.000 ug/l	0.067 lbs/day
Pentachlorophenol	13.00 ug/l	568.828 lbs/day	20.000 ug/l	0.668 lbs/day
Toxephene	0.0002 ug/l	0.009 lbs/day	0.7300 ug/l	0.024 lbs/day

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	12.53 lbs/day
Cadmium			10.0 ug/l	0.17 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	20.05 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			50.0 ug/l	2.188 lbs/day
Barium			1000.0 ug/l	43.756 lbs/day
Cadmium			10.0 ug/l	0.438 lbs/day
Chromium			50.0 ug/l	2.188 lbs/day
Lead			50.0 ug/l	2.188 lbs/day
Mercury			2.0 ug/l	0.088 lbs/day
Selenium			10.0 ug/l	0.438 lbs/day
Silver			50.0 ug/l	2.188 lbs/day
Fluoride (3)			1.4 ug/l	0.061 lbs/day
to			2.4 ug/l	0.105 lbs/day
Nitrates as N			10.0 ug/l	0.438 lbs/day
Chlorophenoxy Herbicides				
2,4-D			100.0 ug/l	4.376 lbs/day
2,4,5-TP			10.0 ug/l	0.438 lbs/day
Endrin			0.2 ug/l	0.009 lbs/day
ocyclohexane (Lindane)			4.0 ug/l	0.175 lbs/day
Methoxychlor			100.0 ug/l	4.376 lbs/day
Toxaphene			5.0 ug/l	0.219 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	52.51 lbs/day	2700.0 ug/l	118.14 lbs/day
Acrolein	320.00 ug/l	14.00 lbs/day	780.0 ug/l	34.13 lbs/day
Acrylonitrile	0.06 ug/l	0.00 lbs/day	0.7 ug/l	0.03 lbs/day
Benzene	1.20 ug/l	0.05 lbs/day	71.0 ug/l	3.11 lbs/day
Benzidine	0.00012 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Carbon tetrachloride	0.25 ug/l	0.01 lbs/day	4.4 ug/l	0.19 lbs/day
Chlorobenzene	680.00 ug/l	29.75 lbs/day	21000.0 ug/l	918.88 lbs/day
1,2,4-Trichlorobenzene				
Hexachlorobenzene	0.00075 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Dichloroethane	0.38 ug/l	0.02 lbs/day	99.0 ug/l	4.33 lbs/day

1,1,1-Trichloroethane				
Hexachloroethane	1.90 ug/l	0.08 lbs/day	8.9 ug/l	0.39 lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	0.61 ug/l	0.03 lbs/day	42.0 ug/l	1.84 lbs/day
1,1,2,2-Tetrachloroethai	0.17 ug/l	0.01 lbs/day	11.0 ug/l	0.48 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	0.06 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	74.39 lbs/day	4300.0 ug/l	188.15 lbs/day
2,4,6-Trichlorophenol	2.10 ug/l	0.09 lbs/day	6.5 ug/l	0.28 lbs/day
p-Chloro-m-cresol			0.0 ug/l	0.00 lbs/day
Chloroform (HM)	5.70 ug/l	0.25 lbs/day	470.0 ug/l	20.57 lbs/day
2-Chlorophenol	120.00 ug/l	5.25 lbs/day	400.0 ug/l	17.50 lbs/day
1,2-Dichlorobenzene	2700.00 ug/l	118.14 lbs/day	17000.0 ug/l	743.85 lbs/day
1,3-Dichlorobenzene	400.00 ug/l	17.50 lbs/day	2600.0 ug/l	113.77 lbs/day
1,4-Dichlorobenzene	400.00 ug/l	17.50 lbs/day	2600.0 ug/l	113.77 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	0.14 lbs/day
1,2-trans-Dichloroethyle	700.00 ug/l	30.63 lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dichlorophenol	93.00 ug/l	4.07 lbs/day	790.0 ug/l	34.57 lbs/day
1,2-Dichloropropane	0.52 ug/l	0.02 lbs/day	39.0 ug/l	1.71 lbs/day
1,3-Dichloropropylene	10.00 ug/l	0.44 lbs/day	1700.0 ug/l	74.39 lbs/day
2,4-Dimethylphenol	540.00 ug/l	23.63 lbs/day	2300.0 ug/l	100.64 lbs/day
2,4-Dinitrotoluene	0.11 ug/l	0.00 lbs/day	9.1 ug/l	0.40 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	0.02 lbs/day
Ethylbenzene	3100.00 ug/l	135.64 lbs/day	29000.0 ug/l	1268.92 lbs/day
Fluoranthene	300.00 ug/l	13.13 lbs/day	370.0 ug/l	16.19 lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) e	1400.00 ug/l	61.26 lbs/day	170000.0 ug/l	7438.52 lbs/day
Bis(2-chloroethoxy) met	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
Methylene chloride (HM	4.70 ug/l	0.21 lbs/day	1600.0 ug/l	70.01 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	0.19 lbs/day	360.0 ug/l	15.75 lbs/day
Dichlorobromomethane	0.27 ug/l	0.01 lbs/day	22.0 ug/l	0.96 lbs/day
Chlorodibromomethane	0.41 ug/l	0.02 lbs/day	34.0 ug/l	1.49 lbs/day
Hexachlorobutadiene(c)	0.44 ug/l	0.02 lbs/day	50.0 ug/l	2.19 lbs/day
Hexachlorocyclopentadi	240.00 ug/l	10.50 lbs/day	17000.0 ug/l	743.85 lbs/day
Isophorone	8.40 ug/l	0.37 lbs/day	600.0 ug/l	26.25 lbs/day
Naphthalene				
Nitrobenzene	17.00 ug/l	0.74 lbs/day	1900.0 ug/l	83.14 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	3.06 lbs/day	14000.0 ug/l	612.58 lbs/day
4,6-Dinitro-o-cresol	13.00 ug/l	0.57 lbs/day	765.0 ug/l	33.47 lbs/day
N-Nitrosodimethylamine	0.00069 ug/l	0.00 lbs/day	8.1 ug/l	0.35 lbs/day
N-Nitrosodiphenylamine	5.00 ug/l	0.22 lbs/day	16.0 ug/l	0.70 lbs/day
N-Nitrosodi-n-propylami	0.01 ug/l	0.00 lbs/day	1.4 ug/l	0.06 lbs/day
Pentachlorophenol	0.28 ug/l	0.01 lbs/day	8.2 ug/l	0.36 lbs/day

Phenol	2.10E+04 ug/l	9.19E+02 lbs/day	4.6E+06 ug/l	2.01E+05 lbs/day
Bis(2-ethylhexyl)phthala	1.80 ug/l	0.08 lbs/day	5.9 ug/l	0.26 lbs/day
Butyl benzyl phthalate	3000.00 ug/l	131.27 lbs/day	5200.0 ug/l	227.53 lbs/day
Di-n-butyl phthalate	2700.00 ug/l	118.14 lbs/day	12000.0 ug/l	525.07 lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	23000.00 ug/l	1006.39 lbs/day	120000.0 ug/l	5250.72 lbs/day
Dimethyl phthlate	3.13E+05 ug/l	1.37E+04 lbs/day	2.9E+06 ug/l	1.27E+05 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	420.06 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	42.01 lbs/day	11000.0 ug/l	481.32 lbs/day
Tetrachloroethylene	0.80 ug/l	0.04 lbs/day	8.9 ug/l	0.39 lbs/day
Toluene	6800.00 ug/l	297.54 lbs/day	200000 ug/l	8751.20 lbs/day
Trichloroethylene	2.70 ug/l	0.12 lbs/day	81.0 ug/l	3.54 lbs/day
Vinyl chloride	2.00 ug/l	0.09 lbs/day	525.0 ug/l	22.97 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	0.04 lbs/day	2.0 ug/l	0.09 lbs/day
beta-Endosulfan	0.9300 ug/l	0.04 lbs/day	2.0 ug/l	0.09 lbs/day
Endosulfan sulfate	0.9300 ug/l	0.04 lbs/day	2.0 ug/l	0.09 lbs/day
Endrin	0.7600 ug/l	0.03 lbs/day	0.8 ug/l	0.04 lbs/day
Endrin aldehyde	0.7600 ug/l	0.03 lbs/day	0.8 ug/l	0.04 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 12/	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1254 (Arochlor 12	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1221 (Arochlor 12	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1232 (Arochlor 12	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1248 (Arochlor 12/	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1260 (Arochlor 12	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1016 (Arochlor 10	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

Metals				
Antimony	14.0 ug/l	0.61 lbs/day		
Arsenic	50.0 ug/l	2.19 lbs/day	4300.00 ug/l	188.15 lbs/day
Asbestos	7.00E+06 ug/l	3.06E+05 lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	1.30E+03 ug/l	56.88 lbs/day	2.2E+05 ug/l	9626.32 lbs/day
Lead	700.0 ug/l	30.63 lbs/day		
Mercury			0.15 ug/l	0.01 lbs/day
Nickel			4600.00 ug/l	201.28 lbs/day
Selenium	0.1 ug/l	0.01 lbs/day		
Silver	610.0 ug/l	26.69 lbs/day		
Thallium			6.30 ug/l	0.28 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)	1.93	16.2	7.9	0.06	1.00	7.20	0.00	523.0
Fall	4.23	4.1	8.0	0.03	1.00	---	0.00	616.0
Winter	5.73	4.8	8.0	0.02	1.00	---	0.00	694.0
Spring	6.01	10.7	8.2	0.06	1.00	---	0.00	433.0

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	11.30	3.57	0.11	1.45	3.975*	1.72	12.0	0.38

Dissolved Metals	Hg ug/l	Ni ug/l	Se ug/l	Ag ug/l	Zn ug/l	Boron ug/l	
All Seasons	0.0000	2.92	0.69	0.34	10.75	23.8	* ~80% MDL

Projected Discharge Information

Season	Flow, MGD	Temp.
Summer	4.00000	18.2
Fall	4.00000	12.9
Winter	4.00000	8.3
Spring	4.00000	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	4.000 MGD	6.188 cfs
Fall	4.000 MGD	6.188 cfs
Winter	4.000 MGD	6.188 cfs
Spring	4.000 MGD	6.188 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 4 MGD. If the discharger is allowed to have a flow greater than 4 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.

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 >	100.0% Effluent	[Acute]
	IC25 >	76.2% Effluent	[Chronic]

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	833.8 lbs/day
Fall	25.0 mg/l as BOD5	833.8 lbs/day
Winter	25.0 mg/l as BOD5	833.8 lbs/day
Spring	25.0 mg/l as BOD5	833.8 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	5.06	mg/l as N	168.6	lbs/day
	1 Hour Avg. - Acute	16.5	mg/l as N	551.6	lbs/day
Fall	4 Day Avg. - Chronic	6.1	mg/l as N	202.4	lbs/day
	1 Hour Avg. - Acute	11.1	mg/l as N	370.4	lbs/day
Winter	4 Day Avg. - Chronic	6.5	mg/l as N	218.0	lbs/day
	1 Hour Avg. - Acute	13.0	mg/l as N	432.9	lbs/day
Spring	4 Day Avg. - Chronic	6.1	mg/l as N	202.0	lbs/day
	1 Hour Avg. - Acute	12.3	mg/l as N	409.6	lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 100.%.

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	0.014	mg/l	0.47	lbs/day
	1 Hour Avg. - Acute	0.025	mg/l	0.82	lbs/day
Fall	4 Day Avg. - Chronic	0.018	mg/l	0.59	lbs/day
	1 Hour Avg. - Acute	0.031	mg/l	1.04	lbs/day
Winter	4 Day Avg. - Chronic	0.020	mg/l	0.68	lbs/day
	1 Hour Avg. - Acute	0.036	mg/l	1.19	lbs/day
Spring	4 Day Avg. - Chronic	0.021	mg/l	0.69	lbs/day
	1 Hour Avg. - Acute	0.036	mg/l	1.22	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	1411.2	mg/l	23.53	tons/day
Fall	Maximum, Acute	1599.2	mg/l	26.67	tons/day
Winter	Maximum, Acute	1668.5	mg/l	27.83	tons/day
Spring	Maximum, Acute	1944.9	mg/l	32.44	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 339.57 mg/l):

	4 Day Average Concentration		Load	1 Hour Average Concentration		Load
Aluminum*	N/A		N/A	865.2	ug/l	28.9 lbs/day
Arsenic*	248.15	ug/l	5.4 lbs/day	392.5	ug/l	13.1 lbs/day
Cadmium	0.84	ug/l	0.0 lbs/day	8.5	ug/l	0.3 lbs/day
Chromium III	307.25	ug/l	6.6 lbs/day	5,672.2	ug/l	189.6 lbs/day
Chromium VI*	13.19	ug/l	0.3 lbs/day	17.9	ug/l	0.6 lbs/day
Copper	34.25	ug/l	0.7 lbs/day	50.9	ug/l	1.7 lbs/day
Iron*	N/A		N/A	7,141.4	ug/l	238.7 lbs/day
Lead	19.67	ug/l	0.4 lbs/day	447.4	ug/l	15.0 lbs/day
Mercury*	0.02	ug/l	0.0 lbs/day	2.8	ug/l	0.1 lbs/day
Nickel	191.59	ug/l	4.1 lbs/day	1,525.1	ug/l	51.0 lbs/day
Selenium*	5.82	ug/l	0.1 lbs/day	23.0	ug/l	0.8 lbs/day
Silver	N/A	ug/l	N/A lbs/day	35.8	ug/l	1.2 lbs/day

Zinc	439.51 ug/l	9.5 lbs/day	388.5	ug/l	13.0 lbs/day
Cyanide*	6.82 ug/l	0.1 lbs/day	25.4	ug/l	0.8 lbs/day

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

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	18.9 Deg. C.	65.9 Deg. F
Fall	7.5 Deg. C.	45.4 Deg. F
Winter	8.7 Deg. C.	47.6 Deg. F
Spring	14.6 Deg. C.	58.3 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 Concentration	Load	1 Hour Average Concentration	Load
Aldrin			1.5E+00 ug/l	7.75E-02 lbs/day
Chlordane	4.30E-03 ug/l	1.43E-01 lbs/day	1.2E+00 ug/l	6.20E-02 lbs/day
DDT, DDE	1.00E-03 ug/l	3.34E-02 lbs/day	5.5E-01 ug/l	2.84E-02 lbs/day
Dieldrin	1.90E-03 ug/l	6.34E-02 lbs/day	1.3E+00 ug/l	6.46E-02 lbs/day
Endosulfan	5.60E-02 ug/l	1.87E+00 lbs/day	1.1E-01 ug/l	5.69E-03 lbs/day
Endrin	2.30E-03 ug/l	7.67E-02 lbs/day	9.0E-02 ug/l	4.65E-03 lbs/day
Guthion	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02 ug/l	5.17E-04 lbs/day
Heptachlor	3.80E-03 ug/l	1.27E-01 lbs/day	2.6E-01 ug/l	1.34E-02 lbs/day
Lindane	8.00E-02 ug/l	2.67E+00 lbs/day	1.0E+00 ug/l	5.17E-02 lbs/day
Methoxychlor	0.00E+00 ug/l	0.00E+00 lbs/day	3.0E-02 ug/l	1.55E-03 lbs/day
Mirex	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02 ug/l	5.17E-04 lbs/day
Parathion	0.00E+00 ug/l	0.00E+00 lbs/day	4.0E-02 ug/l	2.07E-03 lbs/day
PCB's	1.40E-02 ug/l	4.67E-01 lbs/day	2.0E+00 ug/l	1.03E-01 lbs/day
Pentachlorophenol	1.30E+01 ug/l	4.34E+02 lbs/day	2.0E+01 ug/l	1.03E+00 lbs/day
Toxephene	2.00E-04 ug/l	6.67E-03 lbs/day	7.3E-01 ug/l	3.77E-02 lbs/day

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	167.1 lbs/day
Nitrates as N	4.0 mg/l	133.7 lbs/day
Total Phosphorus as P	0.05 mg/l	1.7 lbs/day
Total Suspended Solids	90.0 mg/l	3007.6 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	1.57E+03 ug/l	5.25E+01 lbs/day
Acrolein	4.20E+02 ug/l	1.40E+01 lbs/day
Acrylonitrile	7.74E-02 ug/l	2.58E-03 lbs/day
Benzene	1.57E+00 ug/l	5.25E-02 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	3.28E-01 ug/l	1.09E-02 lbs/day
Chlorobenzene	8.92E+02 ug/l	2.98E+01 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	9.84E-04 ug/l	3.28E-05 lbs/day
1,2-Dichloroethane	4.99E-01 ug/l	1.66E-02 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	2.49E+00 ug/l	8.31E-02 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	8.00E-01 ug/l	2.67E-02 lbs/day
1,1,2,2-Tetrachloroethane	2.23E-01 ug/l	7.44E-03 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	4.07E-02 ug/l	1.36E-03 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	2.23E+03 ug/l	7.44E+01 lbs/day
2,4,6-Trichlorophenol	2.75E+00 ug/l	9.19E-02 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	7.48E+00 ug/l	2.49E-01 lbs/day
2-Chlorophenol	1.57E+02 ug/l	5.25E+00 lbs/day
1,2-Dichlorobenzene	3.54E+03 ug/l	1.18E+02 lbs/day
1,3-Dichlorobenzene	5.25E+02 ug/l	1.75E+01 lbs/day

1,4-Dichlorobenzene	5.25E+02 ug/l	1.75E+01 lbs/day
3,3'-Dichlorobenzidine	5.25E-02 ug/l	1.75E-03 lbs/day
1,1-Dichloroethylene	7.48E-02 ug/l	2.49E-03 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	1.22E+02 ug/l	4.07E+00 lbs/day
1,2-Dichloropropane	6.82E-01 ug/l	2.28E-02 lbs/day
1,3-Dichloropropylene	1.31E+01 ug/l	4.38E-01 lbs/day
2,4-Dimethylphenol	7.08E+02 ug/l	2.36E+01 lbs/day
2,4-Dinitrotoluene	1.44E-01 ug/l	4.81E-03 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	5.25E-02 ug/l	1.75E-03 lbs/day
Ethylbenzene	4.07E+03 ug/l	1.36E+02 lbs/day
Fluoranthene	3.94E+02 ug/l	1.31E+01 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	1.84E+03 ug/l	6.13E+01 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	6.17E+00 ug/l	2.06E-01 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	5.64E+00 ug/l	1.88E-01 lbs/day
Dichlorobromomethane(HM)	3.54E-01 ug/l	1.18E-02 lbs/day
Chlorodibromomethane (HM)	5.38E-01 ug/l	1.79E-02 lbs/day
Hexachlorocyclopentadiene	3.15E+02 ug/l	1.05E+01 lbs/day
Isophorone	1.10E+01 ug/l	3.68E-01 lbs/day
Naphthalene		
Nitrobenzene	2.23E+01 ug/l	7.44E-01 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	9.18E+01 ug/l	3.06E+00 lbs/day
4,6-Dinitro-o-cresol	1.71E+01 ug/l	5.69E-01 lbs/day
N-Nitrosodimethylamine	9.05E-04 ug/l	3.02E-05 lbs/day
N-Nitrosodiphenylamine	6.56E+00 ug/l	2.19E-01 lbs/day
N-Nitrosodi-n-propylamine	6.56E-03 ug/l	2.19E-04 lbs/day
Pentachlorophenol	3.67E-01 ug/l	1.23E-02 lbs/day
Phenol	2.75E+04 ug/l	9.19E+02 lbs/day
Bis(2-ethylhexyl)phthalate	2.36E+00 ug/l	7.88E-02 lbs/day
Butyl benzyl phthalate	3.94E+03 ug/l	1.31E+02 lbs/day
Di-n-butyl phthalate	3.54E+03 ug/l	1.18E+02 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	3.02E+04 ug/l	1.01E+03 lbs/day
Dimethyl phthlate	4.11E+05 ug/l	1.37E+04 lbs/day
Benzo(a)anthracene (PAH)	3.67E-03 ug/l	1.23E-04 lbs/day
Benzo(a)pyrene (PAH)	3.67E-03 ug/l	1.23E-04 lbs/day
Benzo(b)fluoranthene (PAH)	3.67E-03 ug/l	1.23E-04 lbs/day
Benzo(k)fluoranthene (PAH)	3.67E-03 ug/l	1.23E-04 lbs/day
Chrysene (PAH)	3.67E-03 ug/l	1.23E-04 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	3.67E-03 ug/l	1.23E-04 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	3.67E-03 ug/l	1.23E-04 lbs/day

Pyrene (PAH)	1.26E+03 ug/l	4.20E+01 lbs/day
Tetrachloroethylene	1.05E+00 ug/l	3.50E-02 lbs/day
Toluene	8.92E+03 ug/l	2.98E+02 lbs/day
Trichloroethylene	3.54E+00 ug/l	1.18E-01 lbs/day
Vinyl chloride	2.62E+00 ug/l	8.75E-02 lbs/day
Pesticides		
Aldrin	1.71E-04 ug/l	5.69E-06 lbs/day
Dieldrin	1.84E-04 ug/l	6.13E-06 lbs/day
Chlordane	7.48E-04 ug/l	2.49E-05 lbs/day
4,4'-DDT	7.74E-04 ug/l	2.58E-05 lbs/day
4,4'-DDE	7.74E-04 ug/l	2.58E-05 lbs/day
4,4'-DDD	1.09E-03 ug/l	3.63E-05 lbs/day
alpha-Endosulfan	1.22E+00 ug/l	4.07E-02 lbs/day
beta-Endosulfan	1.22E+00 ug/l	4.07E-02 lbs/day
Endosulfan sulfate	1.22E+00 ug/l	4.07E-02 lbs/day
Endrin	9.97E-01 ug/l	3.33E-02 lbs/day
Endrin aldehyde	9.97E-01 ug/l	3.33E-02 lbs/day
Heptachlor	2.75E-04 ug/l	9.19E-06 lbs/day
Heptachlor epoxide		
PCB's		
PCB 1242 (Arochlor 1242)	5.77E-05 ug/l	1.93E-06 lbs/day
PCB-1254 (Arochlor 1254)	5.77E-05 ug/l	1.93E-06 lbs/day
PCB-1221 (Arochlor 1221)	5.77E-05 ug/l	1.93E-06 lbs/day
PCB-1232 (Arochlor 1232)	5.77E-05 ug/l	1.93E-06 lbs/day
PCB-1248 (Arochlor 1248)	5.77E-05 ug/l	1.93E-06 lbs/day
PCB-1260 (Arochlor 1260)	5.77E-05 ug/l	1.93E-06 lbs/day
PCB-1016 (Arochlor 1016)	5.77E-05 ug/l	1.93E-06 lbs/day
Pesticide		
Toxaphene	9.58E-04 ug/l	3.19E-05 lbs/day
Metals		
Antimony	18.37 ug/l	0.61 lbs/day
Arsenic	64.48 ug/l	2.15 lbs/day
Asbestos	9.18E+06 ug/l	3.06E+05 lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	1705.46 ug/l	56.88 lbs/day
Cyanide	918.33 ug/l	30.63 lbs/day
Lead	0.00	0.00
Mercury	0.18 ug/l	0.01 lbs/day
Nickel	800.26 ug/l	26.69 lbs/day
Selenium	0.00	0.00
Silver	0.00	0.00
Thallium	2.23 ug/l	0.07 lbs/day
Zinc		

Dioxin		
Dioxin (2,3,7,8-TCDD)	1.71E-08 ug/l	5.69E-10 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		865.2				865.2	N/A
Antimony			18.4	5641.1		18.4	
Arsenic	131.2	392.5	64.5			64.5	248.1
Barium					1311.9	1311.9	
Beryllium						0.0	
Cadmium	13.1	8.5				8.5	0.8
Chromium (III)		5672.2				5672.2	307.2
Chromium (VI)	130.7	17.9				17.88	13.19
Copper	261.8	50.9	1705.5			50.9	34.2
Cyanide		25.4	288616.7			25.4	6.8
Iron		7141.4				7141.4	
Lead	131.1	447.4				131.1	19.7
Mercury		2.77	0.2	0.20		0.18	0.016
Nickel		1525.1	800.3	6034.7		800.3	191.6
Selenium	65.4	23.0				23.0	5.8
Silver		35.8				35.8	
Thallium			2.2	8.3		2.2	
Zinc		388.5				388.5	439.5
Boron	976.5					976.5	
Sulfate	2623.8					2623.8	

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	865.2	N/A	
Antimony	18.37		
Arsenic	64.5	248.1	Acute Controls
Asbestos	9.18E+06		
Barium			
Beryllium			
Cadmium	8.5	0.8	
Chromium (III)	5672.2	307	
Chromium (VI)	17.9	13.2	
Copper	50.9	34.2	

Cyanide	25.4	6.8	
Iron	7141.4		
Lead	131.1	19.7	
Mercury	0.184	0.016	
Nickel	800.3	192	
Selenium	23.0	5.8	
Silver	35.8	N/A	
Thallium	2.2		
Zinc	388.5	439.5	Acute Controls
Boron	976.51		
Sulfate	2623.8		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 down-stream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.