

Christina Osborn

From: Dave Wham <dwham@utah.gov>
Sent: Tuesday, October 04, 2011 1:14 PM
To: James Goodley
Cc: Kim Shelley
Subject: Re: Coalville WLA
Attachments: Coalville_WLA_10-4-11_newlocation.PDF

Jim,

I have attached and updated WLA Addendum for Coalville. This Wasteload was run for the small stream to the west of the proposed plant location. See the effluent limitation section starting about page nine. Please give me a call if you have any questions or need additional information.

Best wishes,

Dave

David Wham
Utah Division of Water Quality
195 North 1950 West
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Salt Lake City, UT 84114
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dwham@utah.gov

>>> "James Goodley" <jgoodley@jub.com> 9/29/2011 8:53 AM >>>

Dave,

Have you had any luck running a new WLA for Coalville? We're planning to submit an EA to ACOE with the ADR as an attachment. One last thing I need to wrap up is the POC's and their ambient concentrations.

Thanks,

Jim

James J. Goodley, P.E.

Project Engineer

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Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility: Coalville City WWTP
UPDES No: UT-0021288
Current Flow: 0.50 MGD Design Flow
Design Flow 0.50 MGD

Receiving Water: Unnamed trib =>Chalk Creek=>Weber River
Stream Classification: 1C, 2B, 3A, 4
Stream Flows [cfs]:
1.5 Summer (July-Sept) 7Q10 Estimate
1.5 Fall (Oct-Dec) 7Q10 Estimate
1.5 Winter (Jan-Mar) 7Q10 Estimate
1.5 Spring (Apr-June) 7Q10 Estimate
2.5 Average
Stream TDS Values:
339.0 Summer (July-Sept) 80th Percentile
339.0 Fall (Oct-Dec) 80th Percentile
339.0 Winter (Jan-Mar) 80th Percentile
339.0 Spring (Apr-June) 80th Percentile

Effluent Limits:	WQ Standard:		
Flow, MGD:	0.50 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:	6.6 Summer	Varies Function of pH and Temperature	
TDS, mg/l:	2869.7 Summer	1200.0	

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

Level 1 Antidegradation Level Completed: Level II Review required

Date: 10/4/2011

Permit Writer: _____

WLA by: _____

WQM Sec. Approval: _____

TMDL Sec. Approval: _____

**Utah Division of Water Quality
Salt Lake City, Utah**

**WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis**

4-Oct-11
4:00 PM

Facilities: Coalville City WWTP
Discharging to: Unnamed trib =>Chalk Creek=>Weber River

UPDES No: UT-0021288

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

Unnamed trib =>Chalk Creek=>Weber 1C, 2B, 3A, 4
Antidegradation Review: Antidegradation Level II Required

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH ₃)	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**	0.363 lbs/day	750.00	ug/l	3.127 lbs/day
Arsenic	190.00 ug/l	0.792 lbs/day	340.00	ug/l	1.418 lbs/day
Cadmium	0.57 ug/l	0.002 lbs/day	5.92	ug/l	0.025 lbs/day
Chromium III	196.16 ug/l	0.818 lbs/day	4104.14	ug/l	17.111 lbs/day
ChromiumVI	11.00 ug/l	0.046 lbs/day	16.00	ug/l	0.067 lbs/day
Copper	22.01 ug/l	0.092 lbs/day	36.06	ug/l	0.150 lbs/day
Iron			1000.00	ug/l	4.169 lbs/day
Lead	11.43 ug/l	0.048 lbs/day	293.20	ug/l	1.222 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40	ug/l	0.010 lbs/day
Nickel	122.00 ug/l	0.509 lbs/day	1097.30	ug/l	4.575 lbs/day
Selenium	4.60 ug/l	0.019 lbs/day	20.00	ug/l	0.083 lbs/day
Silver	N/A ug/l	N/A lbs/day	21.29	ug/l	0.089 lbs/day
Zinc	280.59 ug/l	1.170 lbs/day	280.59	ug/l	1.170 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 273 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	0.006 lbs/day
Chlordane	0.004 ug/l	0.053 lbs/day	1.200	ug/l	0.005 lbs/day
DDT, DDE	0.001 ug/l	0.012 lbs/day	0.550	ug/l	0.002 lbs/day
Dieldrin	0.002 ug/l	0.023 lbs/day	1.250	ug/l	0.005 lbs/day
Endosulfan	0.056 ug/l	0.686 lbs/day	0.110	ug/l	0.000 lbs/day
Endrin	0.002 ug/l	0.028 lbs/day	0.090	ug/l	0.000 lbs/day
Guthion			0.010	ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.047 lbs/day	0.260	ug/l	0.001 lbs/day
Lindane	0.080 ug/l	0.980 lbs/day	1.000	ug/l	0.004 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	0.172 lbs/day	2.000	ug/l	0.008 lbs/day
Pentachlorophenol	13.00 ug/l	159.304 lbs/day	20.000	ug/l	0.083 lbs/day
Toxephene	0.0002 ug/l	0.002 lbs/day	0.7300	ug/l	0.003 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	Load*	Concentration	Load*
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	1.56 lbs/day
Cadmium			10.0 ug/l	0.02 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	2.50 tons/day

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

Metals	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	Load*	Concentration	Load*
Arsenic			50.0 ug/l	0.613 lbs/day
Barium			1000.0 ug/l	12.254 lbs/day
Cadmium			10.0 ug/l	0.123 lbs/day
Chromium			50.0 ug/l	0.613 lbs/day
Lead			50.0 ug/l	0.613 lbs/day
Mercury			2.0 ug/l	0.025 lbs/day
Selenium			10.0 ug/l	0.123 lbs/day
Silver			50.0 ug/l	0.613 lbs/day
Fluoride (3) to Nitrates as N			1.4 ug/l 2.4 ug/l 10.0 ug/l	0.017 lbs/day 0.029 lbs/day 0.123 lbs/day

Chlorophenoxy Herbicides

2,4-D	100.0 ug/l	1.225 lbs/day
2,4,5-TP	10.0 ug/l	0.123 lbs/day
Endrin	0.2 ug/l	0.002 lbs/day
cyclohexane (Lindane)	4.0 ug/l	0.049 lbs/day
Methoxychlor	100.0 ug/l	1.225 lbs/day
Toxaphene	5.0 ug/l	0.061 lbs/day

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

Toxic Organics	Maximum Conc., ug/l - Acute Standards			
	Class 1C [2 Liters/Day for 70 Kg Person over 70 Yr.]		Class 3A, 3B [6.5 g for 70 Kg Person over 70 Yr.]	
Acenaphthene	1200.00 ug/l	14.70 lbs/day	2700.0 ug/l	33.09 lbs/day
Acrolein	320.00 ug/l	3.92 lbs/day	780.0 ug/l	9.56 lbs/day
Acrylonitrile	0.06 ug/l	0.00 lbs/day	0.7 ug/l	0.01 lbs/day
Benzene	1.20 ug/l	0.01 lbs/day	71.0 ug/l	0.87 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	0.00 lbs/day	4.4 ug/l	0.05 lbs/day
Chlorobenzene	680.00 ug/l	8.33 lbs/day	21000.0 ug/l	257.34 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	0.00 lbs/day	99.0 ug/l	1.21 lbs/day

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1,1,1-Trichloroethane				
Hexachloroethane	1.90 ug/l	0.02 lbs/day	8.9 ug/l	0.11 lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	0.61 ug/l	0.01 lbs/day	42.0 ug/l	0.51 lbs/day
1,1,2,2-Tetrachloroethane	0.17 ug/l	0.00 lbs/day	11.0 ug/l	0.13 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	0.02 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	20.83 lbs/day	4300.0 ug/l	52.69 lbs/day
2,4,6-Trichlorophenol	2.10 ug/l	0.03 lbs/day	6.5 ug/l	0.08 lbs/day
p-Chloro-m-cresol			0.0 ug/l	0.00 lbs/day
Chloroform (HM)	5.70 ug/l	0.07 lbs/day	470.0 ug/l	5.76 lbs/day
2-Chlorophenol	120.00 ug/l	1.47 lbs/day	400.0 ug/l	4.90 lbs/day
1,2-Dichlorobenzene	2700.00 ug/l	33.09 lbs/day	17000.0 ug/l	208.32 lbs/day
1,3-Dichlorobenzene	400.00 ug/l	4.90 lbs/day	2600.0 ug/l	31.86 lbs/day
1,4-Dichlorobenzene	400.00 ug/l	4.90 lbs/day	2600.0 ug/l	31.86 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	0.04 lbs/day
1,2-trans-Dichloroethylene	700.00 ug/l	8.58 lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dichlorophenol	93.00 ug/l	1.14 lbs/day	790.0 ug/l	9.68 lbs/day
1,2-Dichloropropane	0.52 ug/l	0.01 lbs/day	39.0 ug/l	0.48 lbs/day
1,3-Dichloropropylene	10.00 ug/l	0.12 lbs/day	1700.0 ug/l	20.83 lbs/day
2,4-Dimethylphenol	540.00 ug/l	6.62 lbs/day	2300.0 ug/l	28.18 lbs/day
2,4-Dinitrotoluene	0.11 ug/l	0.00 lbs/day	9.1 ug/l	0.11 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	0.01 lbs/day
Ethylbenzene	3100.00 ug/l	37.99 lbs/day	29000.0 ug/l	355.37 lbs/day
Fluoranthene	300.00 ug/l	3.68 lbs/day	370.0 ug/l	4.53 lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) ether	1400.00 ug/l	17.16 lbs/day	17000.0 ug/l	2083.21 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	0.06 lbs/day	1600.0 ug/l	19.61 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	0.05 lbs/day	360.0 ug/l	4.41 lbs/day
Dichlorobromomethane	0.27 ug/l	0.00 lbs/day	22.0 ug/l	0.27 lbs/day
Chlorodibromomethane	0.41 ug/l	0.01 lbs/day	34.0 ug/l	0.42 lbs/day
Hexachlorobutadiene(c)	0.44 ug/l	0.01 lbs/day	50.0 ug/l	0.61 lbs/day
Hexachlorocyclopentadiene	240.00 ug/l	2.94 lbs/day	17000.0 ug/l	208.32 lbs/day
Isophorone	8.40 ug/l	0.10 lbs/day	600.0 ug/l	7.35 lbs/day
Naphthalene				
Nitrobenzene	17.00 ug/l	0.21 lbs/day	1900.0 ug/l	23.28 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	0.86 lbs/day	14000.0 ug/l	171.56 lbs/day
4,6-Dinitro-o-cresol	13.00 ug/l	0.16 lbs/day	765.0 ug/l	9.37 lbs/day
N-Nitrosodimethylamine	0.00069 ug/l	0.00 lbs/day	8.1 ug/l	0.10 lbs/day
N-Nitrosodiphenylamine	5.00 ug/l	0.06 lbs/day	16.0 ug/l	0.20 lbs/day
N-Nitrosodi-n-propylamine	0.01 ug/l	0.00 lbs/day	1.4 ug/l	0.02 lbs/day
Pentachlorophenol	0.28 ug/l	0.00 lbs/day	8.2 ug/l	0.10 lbs/day

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Phenol	2.10E+04 ug/l	2.57E+02 lbs/day	4.6E+06 ug/l	5.64E+04 lbs/day
Bis(2-ethylhexyl)phthala	1.80 ug/l	0.02 lbs/day	5.9 ug/l	0.07 lbs/day
Butyl benzyl phthalate	3000.00 ug/l	36.76 lbs/day	5200.0 ug/l	63.72 lbs/day
Di-n-butyl phthalate	2700.00 ug/l	33.09 lbs/day	12000.0 ug/l	147.05 lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	23000.00 ug/l	281.85 lbs/day	120000.0 ug/l	1470.50 lbs/day
Dimethyl phthlate	3.13E+05 ug/l	3.84E+03 lbs/day	2.9E+06 ug/l	3.55E+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	117.64 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	11.76 lbs/day	11000.0 ug/l	134.80 lbs/day
Tetrachloroethylene	0.80 ug/l	0.01 lbs/day	8.9 ug/l	0.11 lbs/day
Toluene	6800.00 ug/l	83.33 lbs/day	200000 ug/l	2450.83 lbs/day
Trichloroethylene	2.70 ug/l	0.03 lbs/day	81.0 ug/l	0.99 lbs/day
Vinyl chloride	2.00 ug/l	0.02 lbs/day	525.0 ug/l	6.43 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	0.02 lbs/day
beta-Endosulfan	0.9300 ug/l	0.01 lbs/day	2.0 ug/l	0.02 lbs/day
Endosulfan sulfate	0.9300 ug/l	0.01 lbs/day	2.0 ug/l	0.02 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 124	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	0.17 lbs/day		
Arsenic	50.0 ug/l	0.61 lbs/day	4300.00 ug/l	52.69 lbs/day
Asbestos	7.00E+06 ug/l	8.58E+04 lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	1.30E+03 ug/l	15.93 lbs/day	2.2E+05 ug/l	2695.92 lbs/day
Lead	700.0 ug/l	8.58 lbs/day		
Mercury			0.15 ug/l	0.00 lbs/day
Nickel			4600.00 ug/l	56.37 lbs/day
Selenium	0.1 ug/l	0.00 lbs/day		
Silver	610.0 ug/l	7.48 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.

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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)	1.5	15.8	8.2	0.03	0.10	7.24	0.00	339.0
Fall	1.5	5.2	8.2	0.03	0.10	---	0.00	339.0
Winter	1.5	2.3	8.2	0.03	0.10	---	0.00	339.0
Spring	1.5	9.8	8.3	0.03	0.10	---	0.00	339.0
Dissolved Metals	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	1.59*	0.53*	0.053*	0.53*	2.65*	0.53*	0.83*	0.53*
Dissolved Metals	Hg	Ni	Se	Ag	Zn	Boron		
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
All Seasons	0.0000	0.53*	1.06*	0.1*	0.053*	10.0		

* 1/2 MDL

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Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	0.50000	16.7	400.00	0.83383
Fall	0.50000	10.9		
Winter	0.50000	12.0		
Spring	0.50000	15.0		

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	0.500 MGD	0.774 cfs
Fall	0.500 MGD	0.774 cfs
Winter	0.500 MGD	0.774 cfs
Spring	0.500 MGD	0.774 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.5 MGD. If the discharger is allowed to have a flow greater than 0.5 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 >	EOP Effluent	[Acute]
	IC25 >	34.0% 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	Load
Summer	25.0 mg/l as BOD5	104.2 lbs/day
Fall	25.0 mg/l as BOD5	104.2 lbs/day
Winter	25.0 mg/l as BOD5	104.2 lbs/day
Spring	25.0 mg/l as BOD5	104.2 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	6.6 mg/l as N	27.4 lbs/day
	1 Hour Avg. - Acute	13.9 mg/l as N	57.9 lbs/day
Fall	4 Day Avg. - Chronic	7.7 mg/l as N	32.0 lbs/day
	1 Hour Avg. - Acute	13.5 mg/l as N	56.4 lbs/day
Winter	4 Day Avg. - Chronic	6.4 mg/l as N	26.6 lbs/day
	1 Hour Avg. - Acute	13.2 mg/l as N	55.0 lbs/day
Spring	4 Day Avg. - Chronic	7.2 mg/l as N	0.0 lbs/day
	1 Hour Avg. - Acute	13.5 mg/l as N	0.0 lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 100.0%.

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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	0.032	mg/l	0.13	lbs/day
	1 Hour Avg. - Acute	0.056	mg/l	0.23	lbs/day
Fall	4 Day Avg. - Chronic	0.032	mg/l	0.13	lbs/day
	1 Hour Avg. - Acute	0.056	mg/l	0.23	lbs/day
Winter	4 Day Avg. - Chronic	0.032	mg/l	0.13	lbs/day
	1 Hour Avg. - Acute	0.056	mg/l	0.23	lbs/day
Spring	4 Day Avg. - Chronic	0.032	mg/l	0.00	lbs/day
	1 Hour Avg. - Acute	0.056	mg/l	0.00	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	2869.7	mg/l	5.98	tons/day
Fall	Maximum, Acute	2869.7	mg/l	5.98	tons/day
Winter	Maximum, Acute	2869.7	mg/l	5.98	tons/day
Spring	4 Day Avg. - Chronic	2869.7	mg/l	5.98	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 273 mg/l):

	4 Day Average		1 Hour Average		Load
	Concentration	Load	Concentration	Load	
Aluminum	N/A	N/A	1,474.9	ug/l	6.1 lbs/day
Arsenic	556.91 ug/l	1.5 lbs/day	668.9	ug/l	2.8 lbs/day
Cadmium	1.52 ug/l	0.0 lbs/day	11.6	ug/l	0.0 lbs/day
Chromium III	575.03 ug/l	1.5 lbs/day	8,082.8	ug/l	33.7 lbs/day
Chromium VI	24.62 ug/l	0.1 lbs/day	27.7	ug/l	0.1 lbs/day
Copper	63.14 ug/l	0.2 lbs/day	70.3	ug/l	0.3 lbs/day
Iron	N/A	N/A	1,968.4	ug/l	8.2 lbs/day
Lead	32.04 ug/l	0.1 lbs/day	576.7	ug/l	2.4 lbs/day
Mercury	0.04 ug/l	0.0 lbs/day	4.7	ug/l	0.0 lbs/day
Nickel	357.04 ug/l	1.0 lbs/day	2,160.5	ug/l	9.0 lbs/day
Selenium	10.44 ug/l	0.0 lbs/day	37.9	ug/l	0.2 lbs/day
Silver	N/A ug/l	N/A lbs/day	41.9	ug/l	0.2 lbs/day

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Zinc	824.57 ug/l	2.2 lbs/day	552.6	ug/l	2.3 lbs/day
Cyanide	15.28 ug/l	0.0 lbs/day	43.3	ug/l	0.2 lbs/day

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

Summer	21.7 Deg. C.	71.0 Deg. F
Fall	11.1 Deg. C.	51.9 Deg. F
Winter	8.2 Deg. C.	46.7 Deg. F
Spring	15.7 Deg. C.	60.2 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	9.67E-03 lbs/day
Chlordane	4.30E-03 ug/l	1.79E-02 lbs/day	1.2E+00	ug/l	7.74E-03 lbs/day
DDT, DDE	1.00E-03 ug/l	4.17E-03 lbs/day	5.5E-01	ug/l	3.55E-03 lbs/day
Dieldrin	1.90E-03 ug/l	7.92E-03 lbs/day	1.3E+00	ug/l	8.06E-03 lbs/day
Endosulfan	5.60E-02 ug/l	2.33E-01 lbs/day	1.1E-01	ug/l	7.09E-04 lbs/day
Endrin	2.30E-03 ug/l	9.59E-03 lbs/day	9.0E-02	ug/l	5.80E-04 lbs/day
Guthion	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	6.45E-05 lbs/day
Heptachlor	3.80E-03 ug/l	1.58E-02 lbs/day	2.6E-01	ug/l	1.68E-03 lbs/day
Lindane	8.00E-02 ug/l	3.34E-01 lbs/day	1.0E+00	ug/l	6.45E-03 lbs/day
Methoxychlor	0.00E+00 ug/l	0.00E+00 lbs/day	3.0E-02	ug/l	1.93E-04 lbs/day
Mirex	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	6.45E-05 lbs/day
Parathion	0.00E+00 ug/l	0.00E+00 lbs/day	4.0E-02	ug/l	2.58E-04 lbs/day
PCB's	1.40E-02 ug/l	5.84E-02 lbs/day	2.0E+00	ug/l	1.29E-02 lbs/day
Pentachlorophenol	1.30E+01 ug/l	5.42E+01 lbs/day	2.0E+01	ug/l	1.29E-01 lbs/day
Toxephene	2.00E-04 ug/l	8.34E-04 lbs/day	7.3E-01	ug/l	4.71E-03 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	20.8 lbs/day
Nitrates as N	4.0 mg/l	16.7 lbs/day
Total Phosphorus as P	0.05 mg/l	0.2 lbs/day
Total Suspended Solids	90.0 mg/l	375.2 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	3.53E+03 ug/l	1.47E+01 lbs/day
Acrolein	9.41E+02 ug/l	3.92E+00 lbs/day
Acrylonitrile	1.73E-01 ug/l	7.23E-04 lbs/day
Benzene	3.53E+00 ug/l	1.47E-02 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	7.35E-01 ug/l	3.06E-03 lbs/day
Chlorobenzene	2.00E+03 ug/l	8.33E+00 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	2.20E-03 ug/l	9.19E-06 lbs/day
1,2-Dichloroethane	1.12E+00 ug/l	4.66E-03 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	5.58E+00 ug/l	2.33E-02 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	1.79E+00 ug/l	7.48E-03 lbs/day
1,1,2,2-Tetrachloroethane	5.00E-01 ug/l	2.08E-03 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	9.11E-02 ug/l	3.80E-04 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	5.00E+03 ug/l	2.08E+01 lbs/day
2,4,6-Trichlorophenol	6.17E+00 ug/l	2.57E-02 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	1.68E+01 ug/l	6.98E-02 lbs/day
2-Chlorophenol	3.53E+02 ug/l	1.47E+00 lbs/day
1,2-Dichlorobenzene	7.94E+03 ug/l	3.31E+01 lbs/day
1,3-Dichlorobenzene	1.18E+03 ug/l	4.90E+00 lbs/day

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1,4-Dichlorobenzene	1.18E+03 ug/l	4.90E+00 lbs/day
3,3'-Dichlorobenzidine	1.18E-01 ug/l	4.90E-04 lbs/day
1,1-Dichloroethylene	1.68E-01 ug/l	6.98E-04 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	2.73E+02 ug/l	1.14E+00 lbs/day
1,2-Dichloropropane	1.53E+00 ug/l	6.37E-03 lbs/day
1,3-Dichloropropylene	2.94E+01 ug/l	1.23E-01 lbs/day
2,4-Dimethylphenol	1.59E+03 ug/l	6.62E+00 lbs/day
2,4-Dinitrotoluene	3.23E-01 ug/l	1.35E-03 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	1.18E-01 ug/l	4.90E-04 lbs/day
Ethylbenzene	9.11E+03 ug/l	3.80E+01 lbs/day
Fluoranthene	8.82E+02 ug/l	3.68E+00 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	4.11E+03 ug/l	1.72E+01 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	1.38E+01 ug/l	5.76E-02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	1.26E+01 ug/l	5.27E-02 lbs/day
Dichlorobromomethane(HM)	7.94E-01 ug/l	3.31E-03 lbs/day
Chlorodibromomethane (HM)	1.21E+00 ug/l	5.02E-03 lbs/day
Hexachlorocyclopentadiene	7.05E+02 ug/l	2.94E+00 lbs/day
Isophorone	2.47E+01 ug/l	1.03E-01 lbs/day
Naphthalene		
Nitrobenzene	5.00E+01 ug/l	2.08E-01 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	2.06E+02 ug/l	8.58E-01 lbs/day
4,6-Dinitro-o-cresol	3.82E+01 ug/l	1.59E-01 lbs/day
N-Nitrosodimethylamine	2.03E-03 ug/l	8.46E-06 lbs/day
N-Nitrosodiphenylamine	1.47E+01 ug/l	6.13E-02 lbs/day
N-Nitrosodi-n-propylamine	1.47E-02 ug/l	6.13E-05 lbs/day
Pentachlorophenol	8.23E-01 ug/l	3.43E-03 lbs/day
Phenol	6.17E+04 ug/l	2.57E+02 lbs/day
Bis(2-ethylhexyl)phthalate	5.29E+00 ug/l	2.21E-02 lbs/day
Butyl benzyl phthalate	8.82E+03 ug/l	3.68E+01 lbs/day
Di-n-butyl phthalate	7.94E+03 ug/l	3.31E+01 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	6.76E+04 ug/l	2.82E+02 lbs/day
Dimethyl phthlate	9.20E+05 ug/l	3.84E+03 lbs/day
Benzo(a)anthracene (PAH)	8.23E-03 ug/l	3.43E-05 lbs/day
Benzo(a)pyrene (PAH)	8.23E-03 ug/l	3.43E-05 lbs/day
Benzo(b)fluoranthene (PAH)	8.23E-03 ug/l	3.43E-05 lbs/day
Benzo(k)fluoranthene (PAH)	8.23E-03 ug/l	3.43E-05 lbs/day
Chrysene (PAH)	8.23E-03 ug/l	3.43E-05 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	8.23E-03 ug/l	3.43E-05 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	8.23E-03 ug/l	3.43E-05 lbs/day

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Pyrene (PAH)	2.82E+03 ug/l	1.18E+01 lbs/day
Tetrachloroethylene	2.35E+00 ug/l	9.80E-03 lbs/day
Toluene	2.00E+04 ug/l	8.33E+01 lbs/day
Trichloroethylene	7.94E+00 ug/l	3.31E-02 lbs/day
Vinyl chloride	5.88E+00 ug/l	2.45E-02 lbs/day

Pesticides

Aldrin	3.82E-04 ug/l	1.59E-06 lbs/day
Dieldrin	4.11E-04 ug/l	1.72E-06 lbs/day
Chlordane	1.68E-03 ug/l	6.98E-06 lbs/day
4,4'-DDT	1.73E-03 ug/l	7.23E-06 lbs/day
4,4'-DDE	1.73E-03 ug/l	7.23E-06 lbs/day
4,4'-DDD	2.44E-03 ug/l	1.02E-05 lbs/day
alpha-Endosulfan	2.73E+00 ug/l	1.14E-02 lbs/day
beta-Endosulfan	2.73E+00 ug/l	1.14E-02 lbs/day
Endosulfan sulfate	2.73E+00 ug/l	1.14E-02 lbs/day
Endrin	2.23E+00 ug/l	9.31E-03 lbs/day
Endrin aldehyde	2.23E+00 ug/l	9.31E-03 lbs/day
Heptachlor	6.17E-04 ug/l	2.57E-06 lbs/day
Heptachlor epoxide		

PCB's

PCB 1242 (Arochlor 1242)	1.29E-04 ug/l	5.39E-07 lbs/day
PCB-1254 (Arochlor 1254)	1.29E-04 ug/l	5.39E-07 lbs/day
PCB-1221 (Arochlor 1221)	1.29E-04 ug/l	5.39E-07 lbs/day
PCB-1232 (Arochlor 1232)	1.29E-04 ug/l	5.39E-07 lbs/day
PCB-1248 (Arochlor 1248)	1.29E-04 ug/l	5.39E-07 lbs/day
PCB-1260 (Arochlor 1260)	1.29E-04 ug/l	5.39E-07 lbs/day
PCB-1016 (Arochlor 1016)	1.29E-04 ug/l	5.39E-07 lbs/day

Pesticide

Toxaphene	2.15E-03 ug/l	8.95E-06 lbs/day
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Metals

Antimony	41.15 ug/l	0.17 lbs/day
Arsenic	145.42 ug/l	0.61 lbs/day
Asbestos	2.06E+07 ug/l	8.58E+04 lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	3821.01 ug/l	15.93 lbs/day
Cyanide	2057.47 ug/l	8.58 lbs/day
Lead	0.00	0.00
Mercury	0.41 ug/l	0.00 lbs/day
Nickel	1792.93 ug/l	7.48 lbs/day
Selenium	0.00	0.00
Silver	0.00	0.00
Thallium	5.00 ug/l	0.02 lbs/day
Zinc		

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Dioxin

Dioxin (2,3,7,8-TCDD) 3.82E-08 ug/l 1.59E-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		1474.9				1474.9	N/A
Antimony			41.1	12638.7		41.1	
Arsenic	293.9	668.9	145.4		0.0	145.4	556.9
Barium					2939.2	2939.2	
Beryllium						0.0	
Cadmium	29.2	11.6			0.0	11.6	1.5
Chromium (III)		8082.8			0.0	8082.8	575.0
Chromium (VI)	292.4	27.7			0.0	27.66	24.62
Copper	586.3	70.3	3821.0			70.3	63.1
Cyanide		43.3	646632.2			43.3	15.3
Iron		1968.4				1968.4	
Lead	292.4	576.7			0.0	292.4	32.0
Mercury		4.73	0.4	0.44	0.0	0.41	0.035
Nickel		2160.5	1792.9	13520.5		1792.9	357.0
Selenium	143.9	37.9			0.0	37.9	10.4
Silver		41.9			0.0	41.9	
Thallium			5.0	18.5		5.0	
Zinc		552.6				552.6	824.6
Boron	2204.4					2204.4	

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	1474.9	N/A	
Antimony	41.15		
Arsenic	145.4	556.9	Acute Controls
Asbestos	2.06E+07		
Barium			
Beryllium			
Cadmium	11.6	1.5	
Chromium (III)	8082.8	575	
Chromium (VI)	27.7	24.6	
Copper	70.3	63.1	

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Cyanide	43.3	15.3	
Iron	1968.4		
Lead	292.4	32.0	
Mercury	0.411	0.035	
Nickel	1792.9	357	
Selenium	37.9	10.4	
Silver	41.9	N/A	
Thallium	5.0		
Zinc	552.6	824.6	Acute Controls
Boron	2204.43		

Other Effluent Limitations are based upon R317-1.

E. coli	126.0 organisms per 100 ml
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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.

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 Review is 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.

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.

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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.

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File Name: Coalville_WLA_3-16-09.xls

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APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day 2.000	CBOD Coeff. FORCED (Kd)/day 0.000	CBOD Coeff. (Ka)T 1/day 1.649	REAER. Coeff. (Ka)20 (Ka)/day 68.686	REAER. Coeff. FORCED 1/day 0.000	REAER. Coeff. (Ka)T 1/day 62.174	NBOD Coeff. (Kn)20 1/day 0.400	NBOD Coeff. (Kn)T 1/day 0.290
Open Coeff. (K4)20 1/day 0.000	Open Coeff. (K4)T 1/day 0.000	NH3 LOSS (K5)20 1/day 4.000	NH3 LOSS (K5)T 1/day 3.298	NO2+NO3 LOSS (K6)20 1/day 0.000	NO2+NO3 LOSS (K6)T 1/day 0.000	TRC Decay K(CI)20 1/day 32.000	TRC K(CI)(T) 1/day 25.053
BENTHIC DEMAND (SOD)20 gm/m2/day 1.000	BENTHIC DEMAND (SOD)T gm/m2/day 0.768						
K1 CBOD {theta} 1.0	K2 Reaer. {theta} 1.0	K3 NH3 {theta} 1.1	K4 Open {theta} 1.0	K5 NH3 Loss {theta} 1.0	K6 NO2+3 {theta} 1.0	K(CI) TRC {theta} 1.1	S Benthic {theta} 1.1

Utah Division of Water Quality
Salt Lake City, Utah

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Review by: _____

2/21/2012

MEETING MINUTES

Subject: Coalville Anti-Degradation Review Coordination Meeting

Date: July 28, 2011

Attendees: DWQ – Lisa Nelson, Nick Von Stackelberg, Dave Wham, Bill Damery, Kim Shelley, Kari Lundeen. JUB Engineers – Trevor Lindley, Jim Goodley

Purpose of the Meeting: Coalville Anti-Deg Review (ADR)

1. **Welcome – Bill Damery.**
2. **Project Status – JUB Engineers.** Trevor Lindley gave a brief history of the existing facility including the negotiations with the Bureau of Reclamation (BOR) and the BORs desire to have the facility relocated. The current status is JUB is putting together USDA submittal packages for USDA to review in anticipation of USDA serving as a funding partner. The WQ Board has already agreed to funding 50 percent of the project with a mix of grant and loan. The City is actively pursuing two parcels of land that are the most feasible for the new site. Those negotiations have been going relatively slow. The City has increased the offer on the land to move an agreement forward. The City would rather not pursue imminent domain.
3. **Anti-Degradation Review.** The primary questions JUB has on the ADR is (1) how/who determines constituents of concern and what might they be (2) how many alternatives need to be investigated.

Constituents of Concern:

Nick and Dave explained the permittee (Coalville/JUB) essentially needs to look at background water quality concentrations and the effluent quality and if an effluent concentration is greater than background then potentially that item is a constituents of concern. After some discussion and review of the background water quality concentrations it was determined the most likely constituents of concern include: BOD, TSS, phosphorus, dissolved oxygen, ammonia, and TDS. Of note on these items:

- a. Phosphorus and oxygen will not have to be included in the ADR because they are addressed in the TMDL.
- b. There is no nitrate data; our goal of TN of 10 is to prepare for future secondary limits.
- c. With the plant making a TN of 10 the ammonia concentration will likely be around 1-2 mg/l which is higher than background. David noted the wasteload allocation for Chalk Creek has ample assimilative capacity.
- d. TDS will be addressed briefly by noting the challenges of brine disposal, cost of TDS removal, and the fact that the proposed system takes the user rates to maximum on MAGI.

Alternatives

It was noted the draft facility plan completed in 2007 proposed maximizing the use of the existing facility. With BOR's stance on vacating the parcel; the Facility Plan Update (December 2010) focused on feasible technologies to meet secondary standards and remove nutrients to a TN of < 10 mg/l and a TP of < 1 mg/l. The alternatives also considered site constraints for the land parcels the City considered to be favorable. The two alternatives for the new site include conventional activated sludge using an MLE process (modified Ludzack-Ettinger) or a membrane bioreactor (MBR). The MLE process targets biological nitrogen removal to reliably meet a TN limit of < 10 mg/l. The MLE process would be site planned for anaerobic zones (bio-P removal) and tertiary filters (Type 1 reuse or further TP removal). The MLE process would start with chemical addition to target effluent TP of < 1 mg/l. The MLE process was selected due to estimated lower capital and operational costs.

The only other potentially viable alternative that was not investigated was an alternative to "get out of the river" and might include aerated lagoons, winter storage, and land application. After some discussion, JUB will investigate that kind of an alternative to see how the numbers come in. The big challenge continues to be finding viable land. This alternative can be discussed in generic terms without specific land being identified.

DWQ noted they will review the ADR but it would likely be an outside stakeholder that would challenge the ADR with regard to if appropriate alternatives have been investigated.

- 4. Ambient WQ and Facility Wasteload.** Dave Wham provided ambient WQ data and the draft wasteload. Of all the constituents discussed and included in the wasteload, DO may need the most attention in the design. The current design does not have re-aeration. The design may need to include re-aeration or try to accommodate a cascade weir at the back end of the facility.

There was quite a lengthy discussion on receiving water. It was noted in the late spring and early summer the receiving water will essentially be the backwaters of Echo Reservoir. In the fall and winter the receiving water will be un-named tributary to Chalk Creek. DWQ at this point has run the wasteload and background on Chalk Creek. After some discussion it was decided to maintain Chalk Creek as the receiving water. However, once the land is finalized DWQ will want to walk the site and look at the un-named tributary. If the un-named tributary has a year round flow it is possible the receiving water will be reclassified. All agreed the un-named tributary was likely a "water of the state" (defined as such if it crosses property boundaries). It was also noted the un-named tributary enters Chalk Creek only a short distance above its own confluence with the Weber River.

- 5. TMDL Status (Kari Lundeen).** DWQ is gathering background data. TMDL will likely go out to contract next year. It will cover Echo and Rockport Reservoirs and the Weber drainage above these two reservoirs. Kari would like to be done in 2014. No stakeholder meetings have been held to date.
- 6. UPDES Timing (Kim Shelley):** DWQ is pushing to have UPDES permits issued prior to construction. All agreed that would be a good thing to have done. Trevor highlighted the schedule with ADR, funding, environmental spanning July, August, September, October. Design October through May and bidding and construction starting summer of 2012. So under that

type of schedule the permit would be issued in about May of 2012. DWQ is starting a fee schedule for permittees. The upside to issuing a permit prior to construction is it seems to give citizens and elected officials a better feeling that the facility will get the permit. The downside is with the permit being issued the 5 year clock starts ticking so for 1 to 2 years during construction the permit is active but in a sense not being used. For Coalville they would have two permits at the same time. The old permit expires August of 2014 which should fit fine with the new permit.

7. Action Items/Other Discussion:

- a. Schedule: JUB anticipates sending out the agency notices early in August and giving them 30 days to respond. JUB would hope to have a draft Env. Report/ADR available early in September. DWQ will need at least 30 days to review the ADR. So the public comment period would potentially be mid-October through mid-November.
- b. The Env. Report will have an ADR section. We proposed referring to an Appendix in the Env. Report and including the ADR forms and narrative in that Appendix. That will allow DWQ to focus on the ADR appendix.
- c. We may have to re-open the Facility Plan if any new alternatives (like land application) are more fully developed. We would rather not re-open the facility plan and just make the Env. Report cover the items necessary for ADR.
- d. JUB will keep the group informed on the land so DWQ can perform a site walk if they need to as part of the Env. Report.

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility: Coalville City WWTP
UPDES No: UT-0021288
Current Flow: 0.58 MGD Design Flow
Design Flow 0.58 MGD

Receiving Water: Unnamed trib =>Chalk Creek=>Weber River
Stream Classification: 1C, 2B, 3A, 4
Stream Flows [cfs]:
1.5 Summer (July-Sept) 7Q10 Estimate
1.5 Fall (Oct-Dec) 7Q10 Estimate
1.5 Winter (Jan-Mar) 7Q10 Estimate
1.5 Spring (Apr-June) 7Q10 Estimate
2.5 Average
Stream TDS Values:
339.0 Summer (July-Sept) 80th Percentile
339.0 Fall (Oct-Dec) 80th Percentile
339.0 Winter (Jan-Mar) 80th Percentile
339.0 Spring (Apr-June) 80th Percentile

Effluent Limits:			WQ Standard:
Flow, MGD:	0.58	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:	6.1	Summer	Varies Function of pH and Temperature
TDS, mg/l:	2639.4	Summer	1200.0

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

Level 1 Antidegradation Level Completed: Level II Review required

Date: 10/4/2011

Permit Writer: _____
WLA by: *[Signature]* _____ 4-2-13
WQM Sec. Approval: _____
TMDL Sec. Approval: _____

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis

4-Oct-11
4:00 PM

Facilities: Coalville City WWTP
Discharging to: Unnamed trib =>Chalk Creek=>Weber River

UPDES No: UT-0021288

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

Unnamed trib =>Chalk Creek=>Weber 1C, 2B, 3A, 4
Antidegradation Review: Antidegradation Level II 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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Salt Lake City, Utah**

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**	0.421 lbs/day	750.00	ug/l	3.627 lbs/day
Arsenic	190.00 ug/l	0.919 lbs/day	340.00	ug/l	1.644 lbs/day
Cadmium	0.57 ug/l	0.003 lbs/day	5.92	ug/l	0.029 lbs/day
Chromium III	196.16 ug/l	0.949 lbs/day	4104.14	ug/l	19.849 lbs/day
ChromiumVI	11.00 ug/l	0.053 lbs/day	16.00	ug/l	0.077 lbs/day
Copper	22.01 ug/l	0.106 lbs/day	36.06	ug/l	0.174 lbs/day
Iron			1000.00	ug/l	4.836 lbs/day
Lead	11.43 ug/l	0.055 lbs/day	293.20	ug/l	1.418 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40	ug/l	0.012 lbs/day
Nickel	122.00 ug/l	0.590 lbs/day	1097.30	ug/l	5.307 lbs/day
Selenium	4.60 ug/l	0.022 lbs/day	20.00	ug/l	0.097 lbs/day
Silver	N/A ug/l	N/A lbs/day	21.29	ug/l	0.103 lbs/day
Zinc	280.59 ug/l	1.357 lbs/day	280.59	ug/l	1.357 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 273 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	0.007 lbs/day
Chlordane	0.004 ug/l	0.056 lbs/day	1.200	ug/l	0.006 lbs/day
DDT, DDE	0.001 ug/l	0.013 lbs/day	0.550	ug/l	0.003 lbs/day
Dieldrin	0.002 ug/l	0.025 lbs/day	1.250	ug/l	0.006 lbs/day
Endosulfan	0.056 ug/l	0.724 lbs/day	0.110	ug/l	0.001 lbs/day
Endrin	0.002 ug/l	0.030 lbs/day	0.090	ug/l	0.000 lbs/day
Guthion			0.010	ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.049 lbs/day	0.260	ug/l	0.001 lbs/day
Lindane	0.080 ug/l	1.034 lbs/day	1.000	ug/l	0.005 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	0.181 lbs/day	2.000	ug/l	0.010 lbs/day
Pentachlorophenol	13.00 ug/l	167.976 lbs/day	20.000	ug/l	0.097 lbs/day
Toxephene	0.0002 ug/l	0.003 lbs/day	0.7300	ug/l	0.004 lbs/day

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Salt Lake City, Utah**

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	1.81 lbs/day
Cadmium			10.0 ug/l	0.02 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	2.90 tons/day

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

Metals	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	Load*	Concentration	Load*
Arsenic			50.0 ug/l	0.646 lbs/day
Barium			1000.0 ug/l	12.921 lbs/day
Cadmium			10.0 ug/l	0.129 lbs/day
Chromium			50.0 ug/l	0.646 lbs/day
Lead			50.0 ug/l	0.646 lbs/day
Mercury			2.0 ug/l	0.026 lbs/day
Selenium			10.0 ug/l	0.129 lbs/day
Silver			50.0 ug/l	0.646 lbs/day
Fluoride (3)			1.4 ug/l	0.018 lbs/day
to			2.4 ug/l	0.031 lbs/day
Nitrates as N			10.0 ug/l	0.129 lbs/day

Chlorophenoxy Herbicides

2,4-D	100.0 ug/l	1.292 lbs/day
2,4,5-TP	10.0 ug/l	0.129 lbs/day
Endrin	0.2 ug/l	0.003 lbs/day
cyclohexane (Lindane)	4.0 ug/l	0.052 lbs/day
Methoxychlor	100.0 ug/l	1.292 lbs/day
Toxaphene	5.0 ug/l	0.065 lbs/day

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

Toxic Organics	Maximum Conc., ug/l - Acute Standards			
	Class 1C		Class 3A, 3B	
	[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	15.51 lbs/day	2700.0 ug/l	34.89 lbs/day
Acrolein	320.00 ug/l	4.13 lbs/day	780.0 ug/l	10.08 lbs/day
Acrylonitrile	0.06 ug/l	0.00 lbs/day	0.7 ug/l	0.01 lbs/day
Benzene	1.20 ug/l	0.02 lbs/day	71.0 ug/l	0.92 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	0.00 lbs/day	4.4 ug/l	0.06 lbs/day
Chlorobenzene	680.00 ug/l	8.79 lbs/day	21000.0 ug/l	271.35 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	0.00 lbs/day	99.0 ug/l	1.28 lbs/day

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1,1,1-Trichloroethane				
Hexachloroethane	1.90 ug/l	0.02 lbs/day	8.9 ug/l	0.11 lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	0.61 ug/l	0.01 lbs/day	42.0 ug/l	0.54 lbs/day
1,1,2,2-Tetrachloroethane	0.17 ug/l	0.00 lbs/day	11.0 ug/l	0.14 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	0.02 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	21.97 lbs/day	4300.0 ug/l	55.56 lbs/day
2,4,6-Trichlorophenol	2.10 ug/l	0.03 lbs/day	6.5 ug/l	0.08 lbs/day
p-Chloro-m-cresol			0.0 ug/l	0.00 lbs/day
Chloroform (HM)	5.70 ug/l	0.07 lbs/day	470.0 ug/l	6.07 lbs/day
2-Chlorophenol	120.00 ug/l	1.55 lbs/day	400.0 ug/l	5.17 lbs/day
1,2-Dichlorobenzene	2700.00 ug/l	34.89 lbs/day	17000.0 ug/l	219.66 lbs/day
1,3-Dichlorobenzene	400.00 ug/l	5.17 lbs/day	2600.0 ug/l	33.60 lbs/day
1,4-Dichlorobenzene	400.00 ug/l	5.17 lbs/day	2600.0 ug/l	33.60 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	0.04 lbs/day
1,2-trans-Dichloroethylene	700.00 ug/l	9.04 lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dichlorophenol	93.00 ug/l	1.20 lbs/day	790.0 ug/l	10.21 lbs/day
1,2-Dichloropropane	0.52 ug/l	0.01 lbs/day	39.0 ug/l	0.50 lbs/day
1,3-Dichloropropylene	10.00 ug/l	0.13 lbs/day	1700.0 ug/l	21.97 lbs/day
2,4-Dimethylphenol	540.00 ug/l	6.98 lbs/day	2300.0 ug/l	29.72 lbs/day
2,4-Dinitrotoluene	0.11 ug/l	0.00 lbs/day	9.1 ug/l	0.12 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	0.01 lbs/day
Ethylbenzene	3100.00 ug/l	40.06 lbs/day	29000.0 ug/l	374.72 lbs/day
Fluoranthene	300.00 ug/l	3.88 lbs/day	370.0 ug/l	4.78 lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) ether	1400.00 ug/l	18.09 lbs/day	170000.0 ug/l	2196.61 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	0.06 lbs/day	1600.0 ug/l	20.67 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	0.06 lbs/day	360.0 ug/l	4.65 lbs/day
Dichlorobromomethane	0.27 ug/l	0.00 lbs/day	22.0 ug/l	0.28 lbs/day
Chlorodibromomethane	0.41 ug/l	0.01 lbs/day	34.0 ug/l	0.44 lbs/day
Hexachlorobutadiene(c)	0.44 ug/l	0.01 lbs/day	50.0 ug/l	0.65 lbs/day
Hexachlorocyclopentadiene	240.00 ug/l	3.10 lbs/day	17000.0 ug/l	219.66 lbs/day
Isophorone	8.40 ug/l	0.11 lbs/day	600.0 ug/l	7.75 lbs/day
Naphthalene				
Nitrobenzene	17.00 ug/l	0.22 lbs/day	1900.0 ug/l	24.55 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	0.90 lbs/day	14000.0 ug/l	180.90 lbs/day
4,6-Dinitro-o-cresol	13.00 ug/l	0.17 lbs/day	765.0 ug/l	9.88 lbs/day
N-Nitrosodimethylamine	0.00069 ug/l	0.00 lbs/day	8.1 ug/l	0.10 lbs/day
N-Nitrosodiphenylamine	5.00 ug/l	0.06 lbs/day	16.0 ug/l	0.21 lbs/day
N-Nitrosodi-n-propylamine	0.01 ug/l	0.00 lbs/day	1.4 ug/l	0.02 lbs/day
Pentachlorophenol	0.28 ug/l	0.00 lbs/day	8.2 ug/l	0.11 lbs/day

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Phenol	2.10E+04 ug/l	2.71E+02 lbs/day	4.6E+06 ug/l	5.94E+04 lbs/day
Bis(2-ethylhexyl)phthala	1.80 ug/l	0.02 lbs/day	5.9 ug/l	0.08 lbs/day
Butyl benzyl phthalate	3000.00 ug/l	38.76 lbs/day	5200.0 ug/l	67.19 lbs/day
Di-n-butyl phthalate	2700.00 ug/l	34.89 lbs/day	12000.0 ug/l	155.05 lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	23000.00 ug/l	297.19 lbs/day	120000.0 ug/l	1550.55 lbs/day
Dimethyl phthlate	3.13E+05 ug/l	4.04E+03 lbs/day	2.9E+06 ug/l	3.75E+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	124.04 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	12.40 lbs/day	11000.0 ug/l	142.13 lbs/day
Tetrachloroethylene	0.80 ug/l	0.01 lbs/day	8.9 ug/l	0.11 lbs/day
Toluene	6800.00 ug/l	87.86 lbs/day	200000 ug/l	2584.25 lbs/day
Trichloroethylene	2.70 ug/l	0.03 lbs/day	81.0 ug/l	1.05 lbs/day
Vinyl chloride	2.00 ug/l	0.03 lbs/day	525.0 ug/l	6.78 lbs/day
			0.0	0.00 lbs/day
			0.0	0.00 lbs/day
Pesticides				
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	0.03 lbs/day
beta-Endosulfan	0.9300 ug/l	0.01 lbs/day	2.0 ug/l	0.03 lbs/day
Endosulfan sulfate	0.9300 ug/l	0.01 lbs/day	2.0 ug/l	0.03 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 124	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1221 (Arochlor 124	0.000044 ug/l	0.00 lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1232 (Arochlor 124	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 124	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

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Metals

Antimony	14.0 ug/l	0.18 lbs/day		
Arsenic	50.0 ug/l	0.65 lbs/day	4300.00 ug/l	55.56 lbs/day
Asbestos	7.00E+06 ug/l	9.04E+04 lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	1.30E+03 ug/l	16.80 lbs/day	2.2E+05 ug/l	2842.67 lbs/day
Lead	700.0 ug/l	9.04 lbs/day		
Mercury			0.15 ug/l	0.00 lbs/day
Nickel			4600.00 ug/l	59.44 lbs/day
Selenium	0.1 ug/l	0.00 lbs/day		
Silver	610.0 ug/l	7.88 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.

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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)	1.5	15.8	8.2	0.03	0.10	7.24	0.00	339.0
Fall	1.5	5.2	8.2	0.03	0.10	---	0.00	339.0
Winter	1.5	2.3	8.2	0.03	0.10	---	0.00	339.0
Spring	1.5	9.8	8.3	0.03	0.10	---	0.00	339.0
Dissolved Metals	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	1.59*	0.53*	0.053*	0.53*	2.65*	0.53*	0.83*	0.53*
Dissolved Metals	Hg	Ni	Se	Ag	Zn	Boron		
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
All Seasons	0.0000	0.53*	1.06*	0.1*	0.053*	10.0		* 1/2 MDL

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Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	0.58000	16.7	400.00	0.96725
Fall	0.58000	10.9		
Winter	0.58000	12.0		
Spring	0.58000	15.0		

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	0.580 MGD	0.897 cfs
Fall	0.580 MGD	0.897 cfs
Winter	0.580 MGD	0.897 cfs
Spring	0.580 MGD	0.897 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.58 MGD. If the discharger is allowed to have a flow greater than 0.58 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 >	EOP Effluent	[Acute]
	IC25 >	37.4% 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	Load
Summer	25.0 mg/l as BOD5	120.9 lbs/day
Fall	25.0 mg/l as BOD5	120.9 lbs/day
Winter	25.0 mg/l as BOD5	120.9 lbs/day
Spring	25.0 mg/l as BOD5	120.9 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	6.1 mg/l as N	29.4 lbs/day
	1 Hour Avg. - Acute	13.1 mg/l as N	63.3 lbs/day
Fall	4 Day Avg. - Chronic	7.1 mg/l as N	34.3 lbs/day
	1 Hour Avg. - Acute	12.7 mg/l as N	61.2 lbs/day
Winter	4 Day Avg. - Chronic	5.9 mg/l as N	28.5 lbs/day
	1 Hour Avg. - Acute	12.4 mg/l as N	59.7 lbs/day
Spring	4 Day Avg. - Chronic	6.7 mg/l as N	0.0 lbs/day
	1 Hour Avg. - Acute	12.7 mg/l as N	0.0 lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 100.0%.

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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	0.029 mg/l	0.14 lbs/day
	1 Hour Avg. - Acute	0.051 mg/l	0.24 lbs/day
Fall	4 Day Avg. - Chronic	0.029 mg/l	0.14 lbs/day
	1 Hour Avg. - Acute	0.051 mg/l	0.24 lbs/day
Winter	4 Day Avg. - Chronic	0.029 mg/l	0.14 lbs/day
	1 Hour Avg. - Acute	0.051 mg/l	0.24 lbs/day
Spring	4 Day Avg. - Chronic	0.029 mg/l	0.00 lbs/day
	1 Hour Avg. - Acute	0.051 mg/l	0.00 lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration	Load
Summer	Maximum, Acute	2639.4 mg/l	6.38 tons/day
Fall	Maximum, Acute	2639.4 mg/l	6.38 tons/day
Winter	Maximum, Acute	2639.4 mg/l	6.38 tons/day
Spring	4 Day Avg. - Chronic	2639.4 mg/l	6.38 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 273 mg/l):

	4 Day Average		1 Hour Average		Load
	Concentration	Load	Concentration	Load	
Aluminum	N/A	N/A	1,374.9	ug/l	6.6 lbs/day
Arsenic	506.30 ug/l	1.6 lbs/day	623.5	ug/l	3.0 lbs/day
Cadmium	1.39 ug/l	0.0 lbs/day	10.8	ug/l	0.1 lbs/day
Chromium III	522.77 ug/l	1.6 lbs/day	7,534.0	ug/l	36.4 lbs/day
Chromium VI	22.74 ug/l	0.1 lbs/day	26.1	ug/l	0.1 lbs/day
Copper	57.46 ug/l	0.2 lbs/day	65.5	ug/l	0.3 lbs/day
Iron	N/A	N/A	1,834.8	ug/l	8.9 lbs/day
Lead	29.20 ug/l	0.1 lbs/day	537.6	ug/l	2.6 lbs/day
Mercury	0.03 ug/l	0.0 lbs/day	4.4	ug/l	0.0 lbs/day
Nickel	324.62 ug/l	1.0 lbs/day	2,013.8	ug/l	9.7 lbs/day
Selenium	9.63 ug/l	0.0 lbs/day	35.4	ug/l	0.2 lbs/day
Silver	N/A ug/l	N/A lbs/day	39.1	ug/l	0.2 lbs/day

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Zinc	749.54 ug/l	2.3 lbs/day	515.1	ug/l	2.5 lbs/day
Cyanide	13.89 ug/l	0.0 lbs/day	40.4	ug/l	0.2 lbs/day

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

Summer	21.1 Deg. C.	70.1 Deg. F
Fall	10.5 Deg. C.	51.0 Deg. F
Winter	7.6 Deg. C.	45.8 Deg. F
Spring	15.1 Deg. C.	59.3 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		1 Hour Average		
	Concentration	Load	Concentration		Load
Aldrin			1.5E+00	ug/l	1.12E-02 lbs/day
Chlordane	4.30E-03 ug/l	2.08E-02 lbs/day	1.2E+00	ug/l	8.98E-03 lbs/day
DDT, DDE	1.00E-03 ug/l	4.84E-03 lbs/day	5.5E-01	ug/l	4.11E-03 lbs/day
Dieldrin	1.90E-03 ug/l	9.19E-03 lbs/day	1.3E+00	ug/l	9.35E-03 lbs/day
Endosulfan	5.60E-02 ug/l	2.71E-01 lbs/day	1.1E-01	ug/l	8.23E-04 lbs/day
Endrin	2.30E-03 ug/l	1.11E-02 lbs/day	9.0E-02	ug/l	6.73E-04 lbs/day
Guthion	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	7.48E-05 lbs/day
Heptachlor	3.80E-03 ug/l	1.84E-02 lbs/day	2.6E-01	ug/l	1.95E-03 lbs/day
Lindane	8.00E-02 ug/l	3.87E-01 lbs/day	1.0E+00	ug/l	7.48E-03 lbs/day
Methoxychlor	0.00E+00 ug/l	0.00E+00 lbs/day	3.0E-02	ug/l	2.24E-04 lbs/day
Mirex	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	7.48E-05 lbs/day
Parathion	0.00E+00 ug/l	0.00E+00 lbs/day	4.0E-02	ug/l	2.99E-04 lbs/day
PCB's	1.40E-02 ug/l	6.77E-02 lbs/day	2.0E+00	ug/l	1.50E-02 lbs/day
Pentachlorophenol	1.30E+01 ug/l	6.29E+01 lbs/day	2.0E+01	ug/l	1.50E-01 lbs/day
Toxephene	2.00E-04 ug/l	9.67E-04 lbs/day	7.3E-01	ug/l	5.46E-03 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	24.2 lbs/day
Nitrates as N	4.0 mg/l	19.3 lbs/day
Total Phosphorus as P	0.05 mg/l	0.2 lbs/day
Total Suspended Solids	90.0 mg/l	435.3 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	3.21E+03 ug/l	1.55E+01 lbs/day
Acrolein	8.55E+02 ug/l	4.13E+00 lbs/day
Acrylonitrile	1.58E-01 ug/l	7.62E-04 lbs/day
Benzene	3.21E+00 ug/l	1.55E-02 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	6.68E-01 ug/l	3.23E-03 lbs/day
Chlorobenzene	1.82E+03 ug/l	8.79E+00 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	2.00E-03 ug/l	9.69E-06 lbs/day
1,2-Dichloroethane	1.02E+00 ug/l	4.91E-03 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	5.08E+00 ug/l	2.46E-02 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	1.63E+00 ug/l	7.88E-03 lbs/day
1,1,2,2-Tetrachloroethane	4.54E-01 ug/l	2.20E-03 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	8.28E-02 ug/l	4.01E-04 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	4.54E+03 ug/l	2.20E+01 lbs/day
2,4,6-Trichlorophenol	5.61E+00 ug/l	2.71E-02 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	1.52E+01 ug/l	7.37E-02 lbs/day
2-Chlorophenol	3.21E+02 ug/l	1.55E+00 lbs/day
1,2-Dichlorobenzene	7.21E+03 ug/l	3.49E+01 lbs/day
1,3-Dichlorobenzene	1.07E+03 ug/l	5.17E+00 lbs/day

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1,4-Dichlorobenzene	1.07E+03 ug/l	5.17E+00 lbs/day
3,3'-Dichlorobenzidine	1.07E-01 ug/l	5.17E-04 lbs/day
1,1-Dichloroethylene	1.52E-01 ug/l	7.37E-04 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	2.48E+02 ug/l	1.20E+00 lbs/day
1,2-Dichloropropane	1.39E+00 ug/l	6.72E-03 lbs/day
1,3-Dichloropropylene	2.67E+01 ug/l	1.29E-01 lbs/day
2,4-Dimethylphenol	1.44E+03 ug/l	6.98E+00 lbs/day
2,4-Dinitrotoluene	2.94E-01 ug/l	1.42E-03 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	1.07E-01 ug/l	5.17E-04 lbs/day
Ethylbenzene	8.28E+03 ug/l	4.01E+01 lbs/day
Fluoranthene	8.02E+02 ug/l	3.88E+00 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	3.74E+03 ug/l	1.81E+01 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	1.26E+01 ug/l	6.07E-02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	1.15E+01 ug/l	5.56E-02 lbs/day
Dichlorobromomethane(HM)	7.21E-01 ug/l	3.49E-03 lbs/day
Chlorodibromomethane (HM)	1.10E+00 ug/l	5.30E-03 lbs/day
Hexachlorocyclopentadiene	6.41E+02 ug/l	3.10E+00 lbs/day
Isophorone	2.24E+01 ug/l	1.09E-01 lbs/day
Naphthalene		
Nitrobenzene	4.54E+01 ug/l	2.20E-01 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	1.87E+02 ug/l	9.04E-01 lbs/day
4,6-Dinitro-o-cresol	3.47E+01 ug/l	1.68E-01 lbs/day
N-Nitrosodimethylamine	1.84E-03 ug/l	8.92E-06 lbs/day
N-Nitrosodiphenylamine	1.34E+01 ug/l	6.46E-02 lbs/day
N-Nitrosodi-n-propylamine	1.34E-02 ug/l	6.46E-05 lbs/day
Pentachlorophenol	7.48E-01 ug/l	3.62E-03 lbs/day
Phenol	5.61E+04 ug/l	2.71E+02 lbs/day
Bis(2-ethylhexyl)phthalate	4.81E+00 ug/l	2.33E-02 lbs/day
Butyl benzyl phthalate	8.02E+03 ug/l	3.88E+01 lbs/day
Di-n-butyl phthalate	7.21E+03 ug/l	3.49E+01 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	6.15E+04 ug/l	2.97E+02 lbs/day
Dimethyl phthlate	8.36E+05 ug/l	4.04E+03 lbs/day
Benzo(a)anthracene (PAH)	7.48E-03 ug/l	3.62E-05 lbs/day
Benzo(a)pyrene (PAH)	7.48E-03 ug/l	3.62E-05 lbs/day
Benzo(b)fluoranthene (PAH)	7.48E-03 ug/l	3.62E-05 lbs/day
Benzo(k)fluoranthene (PAH)	7.48E-03 ug/l	3.62E-05 lbs/day
Chrysene (PAH)	7.48E-03 ug/l	3.62E-05 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	7.48E-03 ug/l	3.62E-05 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	7.48E-03 ug/l	3.62E-05 lbs/day

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Pyrene (PAH)	2.56E+03 ug/l	1.24E+01 lbs/day
Tetrachloroethylene	2.14E+00 ug/l	1.03E-02 lbs/day
Toluene	1.82E+04 ug/l	8.79E+01 lbs/day
Trichloroethylene	7.21E+00 ug/l	3.49E-02 lbs/day
Vinyl chloride	5.34E+00 ug/l	2.58E-02 lbs/day
Pesticides		
Aldrin	3.47E-04 ug/l	1.68E-06 lbs/day
Dieldrin	3.74E-04 ug/l	1.81E-06 lbs/day
Chlordane	1.52E-03 ug/l	7.37E-06 lbs/day
4,4'-DDT	1.58E-03 ug/l	7.62E-06 lbs/day
4,4'-DDE	1.58E-03 ug/l	7.62E-06 lbs/day
4,4'-DDD	2.22E-03 ug/l	1.07E-05 lbs/day
alpha-Endosulfan	2.48E+00 ug/l	1.20E-02 lbs/day
beta-Endosulfan	2.48E+00 ug/l	1.20E-02 lbs/day
Endosulfan sulfate	2.48E+00 ug/l	1.20E-02 lbs/day
Endrin	2.03E+00 ug/l	9.82E-03 lbs/day
Endrin aldehyde	2.03E+00 ug/l	9.82E-03 lbs/day
Heptachlor	5.61E-04 ug/l	2.71E-06 lbs/day
Heptachlor epoxide		
PCB's		
PCB 1242 (Arochlor 1242)	1.18E-04 ug/l	5.69E-07 lbs/day
PCB-1254 (Arochlor 1254)	1.18E-04 ug/l	5.69E-07 lbs/day
PCB-1221 (Arochlor 1221)	1.18E-04 ug/l	5.69E-07 lbs/day
PCB-1232 (Arochlor 1232)	1.18E-04 ug/l	5.69E-07 lbs/day
PCB-1248 (Arochlor 1248)	1.18E-04 ug/l	5.69E-07 lbs/day
PCB-1260 (Arochlor 1260)	1.18E-04 ug/l	5.69E-07 lbs/day
PCB-1016 (Arochlor 1016)	1.18E-04 ug/l	5.69E-07 lbs/day
Pesticide		
Toxaphene	1.95E-03 ug/l	9.43E-06 lbs/day
Metals		
Antimony	37.40 ug/l	0.18 lbs/day
Arsenic	132.26 ug/l	0.64 lbs/day
Asbestos	1.87E+07 ug/l	9.04E+04 lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	3473.28 ug/l	16.80 lbs/day
Cyanide	1870.23 ug/l	9.04 lbs/day
Lead	0.00	0.00
Mercury	0.37 ug/l	0.00 lbs/day
Nickel	1629.77 ug/l	7.88 lbs/day
Selenium	0.00	0.00
Silver	0.00	0.00
Thallium	4.54 ug/l	0.02 lbs/day
Zinc		

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Cyanide	40.4	13.9	
Iron	1834.8		
Lead	265.8	29.2	
Mercury	0.374	0.032	
Nickel	1629.8	325	
Selenium	35.4	9.6	
Silver	39.1	N/A	
Thallium	4.5		
Zinc	515.1	749.5	Acute Controls
Boron	2003.82		

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.

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 Review is 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.

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.

**Utah Division of Water Quality
Salt Lake City, Utah**

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.

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Salt Lake City, Utah**

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day 2.000	CBOD Coeff. FORCED (Kd)/day 0.000	CBOD Coeff. (Ka)T 1/day 1.649	REAER. Coeff. (Ka)20 (Ka)/day 68.686	REAER. Coeff. FORCED 1/day 0.000	REAER. Coeff. (Ka)T 1/day 62.174	NBOD Coeff. (Kn)20 1/day 0.400	NBOD Coeff. (Kn)T 1/day 0.290
Open Coeff. (K4)20 1/day 0.000	Open Coeff. (K4)T 1/day 0.000	NH3 LOSS (K5)20 1/day 4.000	NH3 LOSS (K5)T 1/day 3.298	NO2+NO3 LOSS (K6)20 1/day 0.000	NO2+NO3 LOSS (K6)T 1/day 0.000	TRC Decay K(CI)20 1/day 32.000	TRC K(CI)(T) 1/day 25.053
BENTHIC DEMAND (SOD)20 gm/m2/day 1.000	BENTHIC DEMAND (SOD)T gm/m2/day 0.768						
K1 CBOD {theta} 1.0	K2 Reaer. {theta} 1.0	K3 NH3 {theta} 1.1	K4 Open {theta} 1.0	K5 NH3 Loss {theta} 1.0	K6 NO2+3 {theta} 1.0	K(CI) TRC {theta} 1.1	S Benthic {theta} 1.1

Utah Division of Water Quality
Salt Lake City, Utah

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Review by: _____

4/2/2013