

FACT SHEET
AND
STATEMENT OF BASIS

RICHMOND CITY
UTAH POLLUTION DISCHARGE ELIMINATION SYSTEM PERMIT NO. UT0020907

FACILITY CONTACT:

Responsible Official: Mike Hall
Mayor, City of Richmond
6 West Main, PO Box 9
Richmond, Utah 84333
Phone: (435) 258-1731

Operator: Scott Ball
6 West Main, PO Box 9
Richmond, Utah 84333
Phone: (435) 994-1572

DESCRIPTION OF FACILITY:

The Richmond City treatment plant (RCTP) has a design capacity of 0.5 MGD. They use an activated sludge process for treatment. Raw wastewater is first treated using a 2 mm screen and compactor followed by grit removal. Following the grit removal system, the process water will enter an aeration basin and then directly into a Membrane Bioreactor (MBR) for microfiltration. The effluent from the MBR will enter an ultra violet disinfection system and then be discharged into an un-named irrigation ditch or to the old lagoon cells and eventually the Cub River.

DESCRIPTION OF DISCHARGE:

Outfall 001 is from the old lagoon cells located at an approximate latitude 41° 55' 25" N and longitude 111° 49' 45" W and has STORET #490372.

A new outfall will be established. This outfall is to an unnamed irrigation ditch to the Cub River. Outfall 002 is located at an approximate latitude 41° 55' 29.463" North and longitude 111° 50' 2.876" West.

RECEIVING WATER CLASSIFICATION:

The Cub River is classified 2B, 3B, and 4. According to Utah Administrative Code (UAC) R317-2-6 the use designations are as follows:

Class 2B Protected for secondary contact recreation such as boating, wading, or similar uses.

- Class 3B Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
- Class 4 Protected for agriculture use including irrigation of crops and stock watering.

SIGNIFICANT PERMIT CHANGES:

During the previous permit cycle, the Richmond City Wastewater treatment plant transitioned from facultative lagoons to Membrane Bio-Reactor facility. As a result of this change, an additional outfall is being added. Additionally, a limit for total phosphorus was added to the permit. This was added because of the finalized TMDL for Cutler Reservoir. The Phosphorous limit for the facility will now be 0.23 Kg per day from April 1-September 30 and 1 mg/L from October 1 – March 31. The facility cannot discharge more than 84 Kg/year of total phosphorous as a sum total of all outfalls. The monthly sum total must be reported on the DMR reports for each month.

The sampling frequency for the facility has been changed to twice monthly based upon the design flow of the facility and the continuous nature of the new discharge.

EFFLUENT LIMITATIONS, SELF-MONITORING AND REPORTING REQUIREMENTS:

Permit effluent limitations are summarized below:

Parameter	Effluent Limitations a/			
	Maximum Monthly Avg	Maximum Weekly Avg	Daily Minimum	Daily Maximum
Effluent Flow, MGD	0.5	NA	NA	NA
BOD ₅ , mg/L	25	35	NA	NA
BOD ₅ Min. % Removal	85	NA	NA	NA
TSS, mg/L	25	35	NA	NA
TSS Min. % Removal	85	NA	NA	NA
E-Coli, No./100mL	126	157	NA	NA
TRC, mg/L a/	NA	NA	NA	0.419
DO, mg/L	NA	NA	5.5	NA
Oil & Grease, mg/L	NA	NA	NA	Visual/10
pH, Standard Units	NA	NA	6.5	9.0
Total Phosphorous, Kg/Year /b /c	NA	NA	NA	84
April 1–September 30, Kg/Day /c	NA	NA	NA	0.23
October 1 – March 31, mg/L	NA	NA	NA	1.0

NA – Not Applicable

- a/ TRC is only required to be sampled from Outfall 001.
- b/ The yearly load cannot exceed the total of the maximum daily load x 365 (0.23 x 365 = 84 Kg).
- c/ Total load as the sum of all outfalls. This total shall be calculated monthly and reported on the Discharge Monitoring report.

Self-Monitoring and Reporting Requirements a/ b/			
Parameter	Frequency	Sample Type	Units
Effluent Total Flow <u>c/ d/</u>	Continuous	Recorder	MGD
BOD ₅ , Influent <u>e/</u> Effluent	2x Monthly	Grab	mg/L
	2x Monthly	Grab	mg/L
TSS, Influent <u>e/</u> Effluent	2x Monthly	Grab	mg/L
	2x Monthly	Grab	mg/L
<i>E. coli</i>	2x Monthly	Grab	No./100mL
TRC <u>f/</u>	Daily	Grab	mg/L
DO	2x Monthly	Grab	mg/L
Oil & Grease <u>g/</u>	2x Monthly	Visual/Grab	mg/L
PH	2x Monthly	Grab	SU
Total Phosphorous	2x Monthly	Grab	mg/L
Total Phosphorous <u>h/</u>	Daily	Calculation	kg/Day

- a/ See Definitions, *Part VI*, for definition of terms.
- b/ If the effluent is used for Type II reuse as defined in R-317-13, then the facility must meet the requirements for Type II reuse as found in R-317-11.5
- c/ Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.
- d/ If the rate of discharge is controlled, the rate and duration of discharge shall be reported.
- e/ In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge.
- f/ TRC is required to be sampled at Outfall 001 when Outfall 001 is discharging.
- g/ A visual monitoring will be conducted monthly for an oil and grease sheen. If a sheen is observed, then a grab sample shall be taken and shall not exceed 10 mg/L.
- h/ Total daily phosphorus load shall be calculated by using the bi-monthly Total Phosphorus concentration and total daily flow of all outfalls.

The sampling frequency for the facility has been changed to twice monthly based upon the design flow of the facility and the continuous nature of the new discharge.

BIOSOLIDS (SEWAGE SLUDGE)

DESCRIPTION OF TREATMENT AND DISPOSAL

The RCWRF is expected to dispose of approximately one hundred and twenty five to one hundred fifty dry metric tons (DMT) of wastewater solids (sewage sludge) per year. The wastewater solids will be stabilized during the MBR process with an average retention time of over 60 days. The wastewater solids from the MBR process will be wasted to the primary cell of the lagoon system where the bio-solids will be naturally attenuated. This method of treatment was approved by the Division of Water Quality in a letter dated June 29, 2011 (Appendix B). Please refer to that letter for further requirements with regards to treatment of biosolids at the Richmond City Wastewater Treatment facility.

PRETREATMENT REQUIREMENTS

RCTP has not been designated for a pretreatment program development because it does not meet conditions which necessitate a full program. The flow through the plant is less than one (1) MGD, and there are no categorical industries discharging to the plant.

Although the permittee does not have a State-approved pretreatment program, any wastewater discharges to the sanitary sewer by industrial users are subject to Federal, State and local pretreatment regulations. Pursuant to *Section 307 of the Clean Water Act*, the permittee shall comply with all applicable Federal General Pretreatment Regulations promulgated, found in *40 CFR 403* and the State Pretreatment Requirements found in *UAC R317-8-8*.

An industrial waste survey (IWS) is required of the permittee as stated in Part II of the permit. The IWS is to assess the needs of the permittee regarding pretreatment assistance. The IWS is required to be submitted within sixty (60) days after the issuance of the permit. If an Industrial User begins to discharge or an existing Industrial User changes their discharge the permittee must resubmit an IWS no later than sixty days following the introduction or change as stated in Part II of the permit.

It is recommended that the permittee perform an annual evaluation of the need to revise or develop technically based local limits for pollutants of concern, to implement the general and specific prohibitions *40 CFR, Part 403.5(a)* and *Part 403.5(b)*. This evaluation may indicate that present local limits are sufficiently protective, need to be revised or should be developed. It is required that the permittee submit any local limits that are developed to the Division of Water Quality for review and if needed public notice.

WHOLE EFFLUENT TOXICITY TESTING:

The need for WET testing at the facility was examined and it was determined that no WET testing is needed at this time. As stated above, the facility has no pretreatment program and there are no categorical industries that discharge to the system. Additionally, the facility has historically only intermittently discharged and the facility's discharge only makes up a small portion of the receiving water. If it is determined that WET testing is needed in the future, Section *V.Q* of the permit allows the permit to be reopened.

PERMIT DURATION:

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by Lonnie Shull
Environmental Scientist
Utah Division of Water Quality
Drafted September 11, 2013
Updated February 11, 2014

Appendix A

Wasteload Analysis

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility: Richmond WWTP

UPDES No: UT-0020907
Current Flow: 0.36 MGD Current flow is intermittent. This value represents an average flow over the
Design Flow 0.50 MGD

Receiving Water: Cub River

Stream Classification: 2B, 3B, 4
Stream Flows [cfs]: 32.6 Summer (July-Sept) 20th Percentile value used for all seasons
32.6 Fall (Oct-Dec) 20th Percentile
32.6 Winter (Jan-Mar) 20th Percentile
32.6 Spring (Apr-June) 20th Percentile
120.3 Average
Stream TDS Values: 338.4 Summer (July-Sept) 80th Percentile value used for all seasons
338.4 Fall (Oct-Dec) 80th Percentile
338.4 Winter (Jan-Mar) 80th Percentile
338.4 Spring (Apr-June) 80th Percentile

Effluent Limits:

Flow, MGD:	0.50 MGD	Design Flow	
BOD, mg/l:	25.0 Summer	5.0 Indicator	
Dissolved Oxygen, mg/l:	5.0 Summer	5.5 30 Day Average	
TNH3, Chronic, mg/l:	52.6 Summer	Varies	Function of pH and Temperature
TDS, mg/l:	37513.1 Summer	1200.0	

WQ Standard:

Modeling Parameters:

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

Antidegradation level I complete, Level II antidegradation review NOT required.

Date: 7/2/2013

Permit Writer:

Louis A. Suetterly

7-8-2013

WLA by:

Phil M. Wray

7-2-13

WQM Sec. Approval:

TMDL Sec. Approval:

Utah Division of Water Quality
Salt Lake City, Utah

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

2-Jul-13
4:00 PM

Facilities: Richmond WWTP
Discharging to: Cub River

UPDES No: UT-0020907

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

Cub River:	2B, 3B, 4
Antidegradation Review:	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)	5.50 mg/l (30 Day Average) 4.00 mg/l (7Day Average) 3.00 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		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	0.61 ug/l	0.003 lbs/day	6.52	ug/l	0.027 lbs/day
Chromium III	211.92 ug/l	0.884 lbs/day	4433.71	ug/l	18.485 lbs/day
ChromiumVI	11.00 ug/l	0.046 lbs/day	16.00	ug/l	0.067 lbs/day
Copper	23.85 ug/l	0.099 lbs/day	39.41	ug/l	0.164 lbs/day
Iron			1000.00	ug/l	4.169 lbs/day
Lead	12.88 ug/l	0.054 lbs/day	330.60	ug/l	1.378 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40	ug/l	0.010 lbs/day
Nickel	132.13 ug/l	0.551 lbs/day	1188.44	ug/l	4.955 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	25.04	ug/l	0.104 lbs/day
Zinc	303.93 ug/l	1.267 lbs/day	303.93	ug/l	1.267 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 300 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	0.773 lbs/day	1.200	ug/l	0.005 lbs/day
DDT, DDE	0.001 ug/l	0.180 lbs/day	0.550	ug/l	0.002 lbs/day
Dieldrin	0.002 ug/l	0.342 lbs/day	1.250	ug/l	0.005 lbs/day
Endosulfan	0.056 ug/l	10.073 lbs/day	0.110	ug/l	0.000 lbs/day
Endrin	0.002 ug/l	0.414 lbs/day	0.090	ug/l	0.000 lbs/day
Guthion			0.010	ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.684 lbs/day	0.260	ug/l	0.001 lbs/day
Lindane	0.080 ug/l	14.391 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	2.518 lbs/day	2.000	ug/l	0.008 lbs/day
Pentachlorophenol	13.00 ug/l	2338.481 lbs/day	20.000	ug/l	0.083 lbs/day
Toxephene	0.0002 ug/l	0.036 lbs/day	0.7300	ug/l	0.003 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	lbs/day
Cadmium			10.0 ug/l	0.02 lbs/day
Chromium			100.0 ug/l	lbs/day

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

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			ug/l	lbs/day
Barium			ug/l	lbs/day
Cadmium			ug/l	lbs/day
Chromium			ug/l	lbs/day
Lead			ug/l	lbs/day
Mercury			ug/l	lbs/day
Selenium			ug/l	lbs/day
Silver			ug/l	lbs/day
Fluoride (3) to			ug/l	lbs/day
Nitrates as N			ug/l	lbs/day
Chlorophenoxy Herbicides				
2,4-D			ug/l	lbs/day
2,4,5-TP			ug/l	lbs/day
Endrin			ug/l	lbs/day
ocyclohexane (Lindane)			ug/l	lbs/day
Methoxychlor			ug/l	lbs/day
Toxaphene			ug/l	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	ug/l	lbs/day	2700.0 ug/l	485.68 lbs/day
Acrolein	ug/l	lbs/day	780.0 ug/l	140.31 lbs/day
Acrylonitrile	ug/l	lbs/day	0.7 ug/l	0.12 lbs/day
Benzene	ug/l	lbs/day	71.0 ug/l	12.77 lbs/day
Benzidine	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Carbon tetrachloride	ug/l	lbs/day	4.4 ug/l	0.79 lbs/day
Chlorobenzene	ug/l	lbs/day	21000.0 ug/l	3777.55 lbs/day
1,2,4-Trichlorobenzene				
Hexachlorobenzene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Dichloroethane	ug/l	lbs/day	99.0 ug/l	17.81 lbs/day
1,1,1-Trichloroethane				
Hexachloroethane	ug/l	lbs/day	8.9 ug/l	1.60 lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	ug/l	lbs/day	42.0 ug/l	7.56 lbs/day
1,1,2,2-Tetrachloroetha	ug/l	lbs/day	11.0 ug/l	1.98 lbs/day
Chloroethane			0.0 ug/l	0.00 lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4 ug/l	0.25 lbs/day

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

2-Chloroethyl vinyl ether	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0 ug/l	773.50 lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5 ug/l	1.17 lbs/day
p-Chloro-m-cresol			0.0 ug/l	0.00 lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0 ug/l	84.55 lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0 ug/l	71.95 lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0 ug/l	3058.01 lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0 ug/l	467.70 lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0 ug/l	467.70 lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1 ug/l	0.01 lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2 ug/l	0.58 lbs/day
1,2-trans-Dichloroethyle	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dichlorophenol	ug/l	lbs/day	790.0 ug/l	142.11 lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0 ug/l	7.02 lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0 ug/l	305.80 lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0 ug/l	413.73 lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1 ug/l	1.64 lbs/day
2,6-Dinitrotoluene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Diphenylhydrazine	ug/l	lbs/day	0.5 ug/l	0.10 lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0 ug/l	5216.61 lbs/day
Fluoranthene	ug/l	lbs/day	370.0 ug/l	66.56 lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) e'	ug/l	lbs/day	170000.0 ug/l	30580.14 lbs/day
Bis(2-chloroethoxy) met	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Methylene chloride (HM)	ug/l	lbs/day	1600.0 ug/l	287.81 lbs/day
Methyl chloride (HM)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Methyl bromide (HM)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Bromoform (HM)	ug/l	lbs/day	360.0 ug/l	64.76 lbs/day
Dichlorobromomethane	ug/l	lbs/day	22.0 ug/l	3.96 lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0 ug/l	6.12 lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0 ug/l	8.99 lbs/day
Hexachlorocyclopentadi	ug/l	lbs/day	17000.0 ug/l	3058.01 lbs/day
Isophorone	ug/l	lbs/day	600.0 ug/l	107.93 lbs/day
Naphthalene				
Nitrobenzene	ug/l	lbs/day	1900.0 ug/l	341.78 lbs/day
2-Nitrophenol	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4-Nitrophenol	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
2,4-Dinitrophenol	ug/l	lbs/day	14000.0 ug/l	2518.36 lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0 ug/l	137.61 lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1 ug/l	1.46 lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0 ug/l	2.88 lbs/day
N-Nitrosodi-n-propylami	ug/l	lbs/day	1.4 ug/l	0.25 lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2 ug/l	1.48 lbs/day
Phenol	ug/l	lbs/day	4.6E+06 ug/l	8.27E+05 lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9 ug/l	1.06 lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0 ug/l	935.39 lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0 ug/l	2158.60 lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	ug/l	lbs/day	120000.0 ug/l	21585.98 lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06 ug/l	5.22E+05 lbs/day

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

Benzo(a)anthracene (PAH)	ug/l	lbs/day	0.0 ug/l	0.01 lbs/day
Benzo(a)pyrene (PAH)	ug/l	lbs/day	0.0 ug/l	0.01 lbs/day
Benzo(b)fluoranthene (PAH)	ug/l	lbs/day	0.0 ug/l	0.01 lbs/day
Benzo(k)fluoranthene (PAH)	ug/l	lbs/day	0.0 ug/l	0.01 lbs/day
Chrysene (PAH)	ug/l	lbs/day	0.0 ug/l	0.01 lbs/day
Acenaphthylene (PAH)				
Anthracene (PAH)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Dibenzo(a,h)anthracene	ug/l	lbs/day	0.0 ug/l	0.01 lbs/day
Indeno(1,2,3-cd)pyrene	ug/l	lbs/day	0.0 ug/l	0.01 lbs/day
Pyrene (PAH)	ug/l	lbs/day	11000.0 ug/l	1978.71 lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9 ug/l	1.60 lbs/day
Toluene	ug/l	lbs/day	200000.0 ug/l	35976.63 lbs/day
Trichloroethylene	ug/l	lbs/day	81.0 ug/l	14.57 lbs/day
Vinyl chloride	ug/l	lbs/day	525.0 ug/l	94.44 lbs/day
				lbs/day
Pesticides				lbs/day
Aldrin	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Dieldrin	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Chlordane	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDT	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDE	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
4,4'-DDD	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
alpha-Endosulfan	ug/l	lbs/day	2.0 ug/l	0.36 lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0 ug/l	0.36 lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0 ug/l	0.36 lbs/day
Endrin	ug/l	lbs/day	0.8 ug/l	0.15 lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8 ug/l	0.15 lbs/day
Heptachlor	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Heptachlor epoxide				
PCB's				
PCB 1242 (Arochlor 1242)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1254 (Arochlor 1254)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1221 (Arochlor 1221)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1232 (Arochlor 1232)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1248 (Arochlor 1248)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1260 (Arochlor 1260)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
PCB-1016 (Arochlor 1016)	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Pesticide				
Toxaphene	ug/l		0.0 ug/l	0.00 lbs/day
Dioxin				
Dioxin (2,3,7,8-TCDD)	ug/l	lbs/day		
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	773.50 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				

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

Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	39574.30 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.03 lbs/day
Nickel			4600.00 ug/l	827.46 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	1.13 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

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

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)	32.6	20.0	8.2	0.10	0.50	6.86	0.00	338.4	
Fall	32.6	12.0	8.1	0.10	0.50	---	0.00	338.4	
Winter	32.6	4.0	8.0	0.10	0.50	---	0.00	338.4	
Spring	32.6	12.0	8.1	0.10	0.50	---	0.00	338.4	
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

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	0.50000	17.0	400.00	0.83383
Fall	0.50000	15.0		
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.

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

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 >	15.8% Effluent	[Acute]
	IC25 >	2.3% 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	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

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

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	52.6 mg/l as N	219.3 lbs/day
	1 Hour Avg. - Acute	97.8 mg/l as N	407.7 lbs/day
Fall	4 Day Avg. - Chronic	88.5 mg/l as N	368.8 lbs/day
	1 Hour Avg. - Acute	109.6 mg/l as N	457.1 lbs/day
Winter	4 Day Avg. - Chronic	101.7 mg/l as N	423.9 lbs/day
	1 Hour Avg. - Acute	128.3 mg/l as N	534.7 lbs/day
Spring	4 Day Avg. - Chronic	88.5 mg/l as N	0.0 lbs/day
	1 Hour Avg. - Acute	109.6 mg/l as N	0.0 lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50.0%.

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	0.475 mg/l	1.98 lbs/day
	1 Hour Avg. - Acute	0.419 mg/l	1.75 lbs/day
Fall	4 Day Avg. - Chronic	0.475 mg/l	1.98 lbs/day
	1 Hour Avg. - Acute	0.419 mg/l	1.75 lbs/day
Winter	4 Day Avg. - Chronic	0.475 mg/l	1.98 lbs/day
	1 Hour Avg. - Acute	0.419 mg/l	1.75 lbs/day
Spring	4 Day Avg. - Chronic	0.475 mg/l	0.00 lbs/day
	1 Hour Avg. - Acute	0.419 mg/l	0.00 lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

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

Season		Concentration	Load
Summer	Maximum, Acute	37513.1 mg/l	78.20 tons/day
Fall	Maximum, Acute	37513.1 mg/l	78.20 tons/day
Winter	Maximum, Acute	37513.1 mg/l	78.20 tons/day
Spring	4 Day Avg. - Chronic	37513.1 mg/l	78.20 tons/day

Colorado Salinity Form 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 300 mg/l):

	4 Day Average		1 Hour Average		Load
	Concentration	Load	Concentration	Load	
Aluminum	N/A	N/A	16,504.5	ug/l	68.8 lbs/day
Arsenic	8,164.25 ug/l	22.0 lbs/day	7,488.1	ug/l	31.2 lbs/day
Cadmium	23.00 ug/l	0.1 lbs/day	142.2	ug/l	0.6 lbs/day
Chromium III	9,109.88 ug/l	24.6 lbs/day	97,848.7	ug/l	407.9 lbs/day
Chromium VI	307.08 ug/l	0.8 lbs/day	269.4	ug/l	1.1 lbs/day
Copper	995.63 ug/l	2.7 lbs/day	853.2	ug/l	3.6 lbs/day
Iron	N/A	N/A	22,046.7	ug/l	91.9 lbs/day
Lead	522.35 ug/l	1.4 lbs/day	7,280.6	ug/l	30.4 lbs/day
Mercury	0.52 ug/l	0.0 lbs/day	53.0	ug/l	0.2 lbs/day
Nickel	5,667.45 ug/l	15.3 lbs/day	26,215.7	ug/l	109.3 lbs/day
Selenium	131.46 ug/l	0.4 lbs/day	408.0	ug/l	1.7 lbs/day
Silver	N/A ug/l	N/A lbs/day	552.7	ug/l	2.3 lbs/day
Zinc	##### ug/l	35.3 lbs/day	6,707.1	ug/l	28.0 lbs/day
Cyanide	224.36 ug/l	0.6 lbs/day	485.6	ug/l	2.0 lbs/day

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

Summer	64.1 Deg. C.	147.5 Deg. F
Fall	56.1 Deg. C.	133.1 Deg. F
Winter	48.1 Deg. C.	118.7 Deg. F
Spring	56.1 Deg. C.	133.1 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:

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

	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

**Effluent Targets for Pollution Indicators
Based upon Water Quality Standards**

In-stream indicator criteria of downstream segments for Pollution Indicators would be met by achieving the following effluent targets

	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:

Toxic Organics	Maximum Concentration	
	Concentration	Load
Acenaphthene	1.16E+05 ug/l	4.86E+02 lbs/day
Acrolein	3.37E+04 ug/l	1.40E+02 lbs/day
Acrylonitrile	2.85E+01 ug/l	1.19E-01 lbs/day
Benzene	3.06E+03 ug/l	1.28E+01 lbs/day

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

	ug/l	lbs/day
Benzidine		
Carbon tetrachloride	1.90E+02 ug/l	7.91E-01 lbs/day
Chlorobenzene	9.06E+05 ug/l	3.78E+03 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	3.32E-02 ug/l	1.39E-04 lbs/day
1,2-Dichloroethane	4.27E+03 ug/l	1.78E+01 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	3.84E+02 ug/l	1.60E+00 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	1.81E+03 ug/l	7.56E+00 lbs/day
1,1,2,2-Tetrachloroethane	4.75E+02 ug/l	1.98E+00 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	6.04E+01 ug/l	2.52E-01 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	1.86E+05 ug/l	7.73E+02 lbs/day
2,4,6-Trichlorophenol	2.80E+02 ug/l	1.17E+00 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	2.03E+04 ug/l	8.45E+01 lbs/day
2-Chlorophenol	1.73E+04 ug/l	7.20E+01 lbs/day
1,2-Dichlorobenzene	7.33E+05 ug/l	3.06E+03 lbs/day
1,3-Dichlorobenzene	1.12E+05 ug/l	4.68E+02 lbs/day
1,4-Dichlorobenzene	1.12E+05 ug/l	4.68E+02 lbs/day
3,3'-Dichlorobenzidine	3.32E+00 ug/l	1.39E-02 lbs/day
1,1-Dichloroethylene	1.38E+02 ug/l	5.76E-01 lbs/day
1,2-trans-Dichloroethylene ¹		
2,4-Dichlorophenol	3.41E+04 ug/l	1.42E+02 lbs/day
1,2-Dichloropropane	1.68E+03 ug/l	7.02E+00 lbs/day
1,3-Dichloropropylene	7.33E+04 ug/l	3.06E+02 lbs/day
2,4-Dimethylphenol	9.92E+04 ug/l	4.14E+02 lbs/day
2,4-Dinitrotoluene	3.93E+02 ug/l	1.64E+00 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	2.33E+01 ug/l	9.71E-02 lbs/day
Ethylbenzene	1.25E+06 ug/l	5.22E+03 lbs/day
Fluoranthene	1.60E+04 ug/l	6.66E+01 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	7.33E+06 ug/l	3.06E+04 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	6.90E+04 ug/l	2.88E+02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	1.55E+04 ug/l	6.48E+01 lbs/day
Dichlorobromomethane(HM)	9.49E+02 ug/l	3.96E+00 lbs/day
Chlorodibromomethane (HM)	1.47E+03 ug/l	6.12E+00 lbs/day
Hexachlorocyclopentadiene	7.33E+05 ug/l	3.06E+03 lbs/day
Isophorone	2.59E+04 ug/l	1.08E+02 lbs/day
Naphthalene		
Nitrobenzene	8.20E+04 ug/l	3.42E+02 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	6.04E+05 ug/l	2.52E+03 lbs/day

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

4,6-Dinitro-o-cresol	3.30E+04 ug/l	1.38E+02 lbs/day
N-Nitrosodimethylamine	3.49E+02 ug/l	1.46E+00 lbs/day
N-Nitrosodiphenylamine	6.90E+02 ug/l	2.88E+00 lbs/day
N-Nitrosodi-n-propylamine	6.04E+01 ug/l	2.52E-01 lbs/day
Pentachlorophenol	3.54E+02 ug/l	1.48E+00 lbs/day
Phenol	1.98E+08 ug/l	8.27E+05 lbs/day
Bis(2-ethylhexyl)phthalate	2.55E+02 ug/l	1.06E+00 lbs/day
Butyl benzyl phthalate	2.24E+05 ug/l	9.35E+02 lbs/day
Di-n-butyl phthalate	5.18E+05 ug/l	2.16E+03 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	5.18E+06 ug/l	2.16E+04 lbs/day
Dimethyl phthlate	1.25E+08 ug/l	5.22E+05 lbs/day
Benzo(a)anthracene (PAH)	1.34E+00 ug/l	5.58E-03 lbs/day
Benzo(a)pyrene (PAH)	1.34E+00 ug/l	5.58E-03 lbs/day
Benzo(b)fluoranthene (PAH)	1.34E+00 ug/l	5.58E-03 lbs/day
Benzo(k)fluoranthene (PAH)	1.34E+00 ug/l	5.58E-03 lbs/day
Chrysene (PAH)	1.34E+00 ug/l	5.58E-03 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	1.34E+00 ug/l	5.58E-03 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	1.34E+00 ug/l	5.58E-03 lbs/day
Pyrene (PAH)	4.75E+05 ug/l	1.98E+03 lbs/day
Tetrachloroethylene	3.84E+02 ug/l	1.60E+00 lbs/day
Toluene	8.63E+06 ug/l	3.60E+04 lbs/day
Trichloroethylene	3.49E+03 ug/l	1.46E+01 lbs/day
Vinyl chloride	2.27E+04 ug/l	9.44E+01 lbs/day
Pesticides		
Aldrin	6.04E-03 ug/l	2.52E-05 lbs/day
Dieldrin	6.04E-03 ug/l	2.52E-05 lbs/day
Chlordane	2.55E-02 ug/l	1.06E-04 lbs/day
4,4'-DDT	2.55E-02 ug/l	1.06E-04 lbs/day
4,4'-DDE	2.55E-02 ug/l	1.06E-04 lbs/day
4,4'-DDD	3.62E-02 ug/l	1.51E-04 lbs/day
alpha-Endosulfan	8.63E+01 ug/l	3.60E-01 lbs/day
beta-Endosulfan	8.63E+01 ug/l	3.60E-01 lbs/day
Endosulfan sulfate	8.63E+01 ug/l	3.60E-01 lbs/day
Endrin	3.49E+01 ug/l	1.46E-01 lbs/day
Endrin aldehyde	3.49E+01 ug/l	1.46E-01 lbs/day
Heptachlor	9.06E-03 ug/l	3.78E-05 lbs/day
Heptachlor epoxide		
PCB's		
PCB 1242 (Arochlor 1242)	1.94E-03 ug/l	8.09E-06 lbs/day
PCB-1254 (Arochlor 1254)	1.94E-03 ug/l	8.09E-06 lbs/day
PCB-1221 (Arochlor 1221)	1.94E-03 ug/l	8.09E-06 lbs/day
PCB-1232 (Arochlor 1232)	1.94E-03 ug/l	8.09E-06 lbs/day
PCB-1248 (Arochlor 1248)	1.94E-03 ug/l	8.09E-06 lbs/day
PCB-1260 (Arochlor 1260)	1.94E-03 ug/l	8.09E-06 lbs/day
PCB-1016 (Arochlor 1016)	1.94E-03 ug/l	8.09E-06 lbs/day

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

Pesticide		
Toxaphene	3.24E-02 ug/l	1.35E-04 lbs/day
Metals		
Antimony	ug/l	lbs/day
Arsenic	ug/l	lbs/day
Asbestos	ug/l	lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	ug/l	lbs/day
Cyanide	ug/l	lbs/day
Lead		
Mercury	ug/l	lbs/day
Nickel	ug/l	lbs/day
Selenium		
Silver		
Thallium	ug/l	lbs/day
Zinc		
Dioxin		
Dioxin (2,3,7,8-TCDD)	6.04E-07 ug/l	2.52E-09 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		16504.5				16504.5	N/A
Antimony				185528.2		185528.2	
Arsenic	4314.6	7488.1			0.0	4314.6	8164.3
Barium						0.0	
Beryllium						0.0	
Cadmium	428.1	142.2			0.0	142.2	23.0
Chromium (III)		97848.7			0.0	97848.7	9109.9
Chromium (VI)	4281.1	269.4			0.0	269.40	307.08
Copper	8595.7	853.2				853.2	995.6
Cyanide		485.6	9492139.6			485.6	224.4
Iron		22046.7				22046.7	
Lead	4281.1	7280.6			0.0	4281.1	522.3
Mercury		52.98		6.47	0.0	6.47	0.518
Nickel		26215.7		198472.0		26215.7	5667.4
Selenium	2090.3	408.0			0.0	408.0	131.5

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

Silver	552.7		0.0	552.7	
Thallium		271.8		271.8	
Zinc	6707.1			6707.1	13110.2
Boron	32359.6			32359.6	

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	16504.5	N/A	
Antimony	185528.18		
Arsenic	4314.6	8164.3	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	142.2	23.0	
Chromium (III)	97848.7	9110	
Chromium (VI)	269.4	307.1	Acute Controls
Copper	853.2	995.6	Acute Controls
Cyanide	485.6	224.4	
Iron	22046.7		
Lead	4281.1	522.3	
Mercury	6.472	0.518	
Nickel	26215.7	5667	
Selenium	408.0	131.5	
Silver	552.7	N/A	
Thallium	271.8		
Zinc	6707.1	13110.2	Acute Controls
Boron	32359.57		

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.

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

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

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.

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.

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.

XIV. Special Considerations - TMDL

The Richmond Lagoons discharge to a segment of the Cub River that is 303(d) listed for total phosphorous (TP). A TP Total Maximum Daily Load (TMDL) was completed for the Cub River on December 23, 1997. The TMDL indicated that the lagoons were contributing a TP load of approximately 2.3 kg/d, and recommended a load reduction to .23 kg/d TP. The city is currently constructing a membrane bioreactor wastewater plant to achieve these more stringent phosphorous limits. When construction is completed, the current permit will be reopened to include TP limits. Additionally, the Cutler Reservoir and Cub River TMDLs are currently scheduled for revision by 2014.

Prepared by:
David Wham
Utah Division of Water Quality
801-538-6052
File Name: Richmond_WLA_7-2-13

APPENDIX - Coefficients and Other Model Information

CBOD	CBOD	CBOD	REAER.	REAER.	REAER.	NBOD	NBOD
Coeff.							

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

(Kd)20	FORCED	(Ka)T	(Ka)20	FORCED	(Ka)T	(Kn)20	(Kn)T
1/day	(Kd)/day	1/day	(Ka)/day	1/day	1/day	1/day	1/day
2.000	0.000	2.000	13.890	0.000	13.890	0.400	0.400
Open	Open	NH3	NH3	NO2+NO3	NO2+NO3	TRC	TRC
Coeff.	Coeff.	LOSS		LOSS		Decay	
(K4)20	(K4)T	(K5)20	(K5)T	(K6)20	(K6)T	K(Cl)20	K(Cl)(T)
1/day	1/day	1/day	1/day	1/day	1/day	1/day	1/day
0.000	0.000	4.000	4.000	0.000	0.000	32.000	32.000
BENTHIC	BENTHIC						
DEMAND	DEMAND						
(SOD)20	(SOD)T						
gm/m2/day	gm/m2/day						
1.000	1.000						
K1	K2	K3	K4	K5	K6	K(Cl)	S
CBOD	Reaer.	NH3	Open	NH3 Loss	NO2+3	TRC	Benthic
{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}
1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1

Appendix B
Biosolids Letter June 29, 2011

PND DRAFT



State of Utah

GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

6/29/11
7-2011
FILE COPY

June 29, 2011

The Honorable Michael Hall
Mayor of Richmond City
P.O. Box 9
Richmond, UT 84333

Document Date 12/18/2013



DWQ-2011-009721

Dear Mayor Hall:

Subject: Approval to Waste Biosolids to the Richmond Sewage Lagoon Primary Cell

We apologize for the amount of time it has taken us to respond to your letter dated April 25, 2011. Proposals similar to those in your letter, to waste and treat biosolids to the primary cell of the Richmond City sewage lagoons, have not been previously approved here in the State of Utah. Considerable discussion and debate were needed to allow us to make a decision regarding the feasibility of the proposal.

The Division of Water Quality (DWQ) has decided that Richmond City can waste biosolids from its membrane bioreactor sewage plant to the primary sewage lagoon cell on an experimental basis, providing the following best management practices and requirements are followed.

- Richmond City must evaluate the lagoon liner in accordance with the liner criteria tables of the Natural Resource Conservation Service (NRCS) Standard Practice 313 and determine if the liner design is adequate to protect underlying ground water for this application. The evaluation must be submitted to the DWQ for review and approval within 120 days of the date of this letter. The liner must be approved for this application if this disposal method is to be approved to continue beyond 180 days of the date of this letter.
- This biosolids disposal method must be terminated immediately, and the biosolids inventory removed from the lagoon and disposed of properly, if the practice is found to cause a threat to ground water, human health, or create an unacceptable nuisance or odor situation or otherwise cause an adverse impact on the environment. The biosolids must be moved as soon as possible, but no longer than 120 days after an unacceptable situation is declared and the current management scheme is determined to be unacceptable. The DWQ and/or the Bear River Health Department will decide the acceptability of any possible unsuitable situations, and Richmond City may be required to dispose of biosolids by one of the two alternate methods identified in the Biosolids Management Plan if an unacceptable situation is created by the proposal.
- A Biosolids Management Plan must be submitted by Richmond City within 120 days upon

195 North 1950 West • Salt Lake City, UT
Mailing Address: P.O. Box 144870 • Salt Lake City, UT 84114-4870
Telephone (801) 536-4300 • Fax (801) 536-4301 • T.D.D. (801) 536-4414

www.deq.utah.gov

Printed on 100% recycled paper

Mr. Michael Hall
June 29, 2011
Page 2 of 2

receipt of this letter. The plan must be approved by the DWQ prior to the issuance of the Biosolids permit.

- Biosolids will only be wasted to the primary cell of the Richmond City wastewater lagoon system. No other cells of the lagoon will be used for biosolids disposal.
- The Biosolids Management Plan shall be appended to the Richmond City Biosolids Permit and considered as a part of that permit. If the Biosolids Management Plan and permit are not followed, as agreed upon by Richmond City and the DWQ, please be aware that Richmond City could be subject to an enforcement action.
- The Biosolids Management Plan shall fully detail at least two alternate methods of proper biosolids disposal in accordance with 40 CFR 503.
- Within the lagoon disposal cell, the sludge blanket will not accumulate to more than 2 feet deep, with no more than 2 feet of water above the sludge blanket, for a total of no more than 4 feet of sludge and water depth. When the sludge blanket reaches a 2 foot depth, further disposal into the cell will be terminated immediately and the biosolids will be removed from the lagoon and disposed of in an acceptable manner within 120 days of reaching the two foot biosolids' depth.
- The Biosolids Management Plan shall describe how the sludge will be removed from the primary cell of the lagoon system. Removal shall be achieved without causing any damage to the original cell liner.

If Richmond City agrees to submit a Biosolids Management Plan, with all of the conditions above, including those in the Biosolids Management Plan, the DWQ will continue to allow Richmond City to waste biosolids to the primary cell of the Richmond City sewage lagoon system as an experimental program.

We wish you success in your attempt to waste and treat biosolids to your primary cell from your membrane bioreactor sewage plant. If you should have comments, suggestions, or questions, please call Mark Schmitz at (801) 536-4384, or email Mark at mschmitz@utah.gov

Sincerely,



Walt Baker, P.E.
Director

MS:mc

cc: Bear River Health Department
Bob Brobst, EPA Region 8
Stephanie Gieck, EPA Region 8
Brad Rasmussen, Aqua, Engineering