FACT SHEET AND STATEMENT OF BASIS
FRESENIUS MEDICAL CARE
RENEWAL PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0023752
MINOR INDUSTRIAL

FACILITY CONTACTS

Person Name:	Brett Barton
Position:	Plant Manager
Person Name:	Jennifer Johnson
Position:	EHS Associate Specialist
Phone Number:	(801) 866-1642
Facility Name:	Fresenius Medical Care
Mailing and Facility Address:	475 West 13th Street Ogden, Utah 84404
Telephone:	(801) 866-1642

DESCRIPTION OF FACILITY

Fresenius Medical Care (FMC) formulates, packages, and manufactures products used in different applications for the treatment of Renal Disease (kidney failure). One product is dialysate solution, and is used in the treatment of peritoneal dialysis. The other product is a dialyzer (special filter), used in hemodialysis treatment. Both of these products and treatments replace the work of kidneys. The plant was remodeled in 2006 to its current standards. FMC has a Standard Industrial Classification (SIC) code of 3841 for Surgical and Medical Instruments and 2834 for Pharmaceutical Preparations. FMC's discharge is located at latitude 41° 14' 32.38" and longitude 111° 59' 22.42", in Weber County, Utah. It has STORET number 492306 and one discharge point, Outfall 001.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

Since the last permit, FMC has expanded their property, mostly to include additional employee parking. Also, in 2020, FMC completed installation of a Micro Lab, but discharges from the lab are directed to the Central Weber Sanitary Sewer District Wastewater Treatment Plant and are not covered by this permit. Consequently, discharges covered in this UPDES permit renewal will remain the same as the previous permit -- non-contact cooling water and stormwater contributing to Outfall 001.

As part of the plant expansion FMC has constructed a detention basin on site. The basin receives all water from Outfall 001, as well as stormwater runoff from the new parking area and other areas of the facility. As this basin was completed in early 2021, FMC is unsure of how it will function when fully operational. The hope is that the basin will act as an evaporation and infiltration pond, with little discharge leaving the property. If the water found in basin, which is a combination of Outfall 001 discharge and stormwater runoff from various areas of the property, leaves the property, it does so by entering a storm drain that leads to the Plain City Canal.

Previously, stormwater discharge requirements and coverage were combined in this individual permit. Permit coverages for non-contact cooling water discharge and stormwater discharge not included in Outfall 001 have been separated to provide consistency among permittees, electronic reporting for stormwater discharge monitoring reports, and increase flexibility to changing site conditions. Therefore, FMC will need to obtain permit coverage under the Multi Sector General Permit (MSGP) for Storm Water Discharges from Industrial Activities. If the facility is not already covered, it has 30 days from when this permit is issued to submit the appropriate Notice of Intent (NOI) for the MSGP or exclusion documentation.

Per *UAC R317-2-13*, the designated beneficial uses of the affected assessment units in the immediate area are (13.13): "all waters not specifically classified are presumptively classified: 2B, 3D" into (13.4a): "Weber River, from Great Salt Lake to Slaterville diversion, except as listed below: 2B, 3C, 3D, 4". However, the Plain City Canal can be designated as a tributary to Mill Creek, a stream not specifically classified, an agricultural irrigation canal, or a drainage canal. The Division of Water Quality (DWQ) believes that the Ogden Nature Center has modified the Plain City Canal into an irrigation canal. Therefore, the designated beneficial uses for the Plain City Canal are (13.9): "All irrigation canals and ditches statewide, except as otherwise designated: 2B, 3E, 4".

DISCHARGE

DESCRIPTION OF DISCHARGE

All water discharged by Outfall 001 is derived from the Ogden City culinary water system and stormwater runoff from specific locations on facility property. Approximately 21,500 gallons per day (gpd) of non-contact cooling water from the production heat exchanger and stormwater runoff contributing to Outfall 001 is discharged to the detention basin. If the basin discharges, it does so via the Plain City Canal, which flows into Mill Creek. Due to the addition of stormwater discharging through Outfall 001, FMC does not sample during storm events greater than 0.10 tenths of an inch or 24 hours thereafter, when flows greater than 21,500 gpd may be present. As a result, a discharge flow rate of 70,000 gpd was used for development of the effluent limits. Five years of self-monitoring shows that FMC has not had any violations during the previous permit cycle.

All sanitary waste, recycled cooling tower water from the boilers, and wastewater from Micro Lab are discharged to the Central Weber Sewer Improvement District's sanitary sewer.

Outfall	Description of Discharge Point
01	Located at latitude 41º 14' 32.38" and longitude 111º 59' 22.42". The discharge flows into the detention basin, then to the Plain City Canal, then to Mill Creek, which is a tributary of the Weber River and hence to the Great Salt Lake. STORET discharge location is 492306.

RECEIVING WATERS AND STREAM CLASSIFICATION

If the discharge leaves the property, it discharges into the Plain City Canal, determined to be an irrigation canal, thence to Mill Creek, which is a tributary of the Weber River. Irrigation canals are classified as 2B, 3E, and 4, and Mill Creek is classified 2B, 3C, 3D, and 4 as is the Weber River from Great Salt Lake to the Slaterville Diversion, according to *Utah Administrative Code (UAC) R317-2-13*:

Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.

Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS

The biological oxygen demand (BOD5) limit is based on the Wasteload Analysis (WLA) and the oil and grease limit is based on best professional judgment (BPJ). Limitations on total suspended solids (TSS) and pH are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. Although FMC is not a publicly owned treatment works (POTW), these standards will be maintained from previous permit to protect water quality, based on BPJ. In accordance with *UAC R317-1-3.2,* FMC has demonstrated that the Technology-based Phosphorus Effluent Limit (TBPEL) is clearly unnecessary to protect waters downstream from the point of discharge, thus no TBPEL has been applied. The TDS limit is based on water quality criteria standard for Class 4 receiving water classification, according to *UAC R317-2.* An Antidegradation Level II review is not required since the Level I review shows that water quality impacts are minimal.

TOTAL MAXIMUM DAILY LOAD REQUIREMENTS

According to the *Utah's 2016 303(d) Water Quality Assessment Report* dated December 7, 2016, the receiving water for the discharge, Weber River and tributaries from Great Salt Lake to Slaterville Diversion was listed as "Not Supporting" for OE Bioassessment and Total Ammonia with impaired beneficial uses 3C and 3D. DWQ has not completed a TMDL for OE Bioassessment or Total Ammonia in the Weber River and has set the development priority as "Low". As the flow is expected to have little impact on these parameters, these listings have not impacted the limits presented in this FSSOB.

Attached is a Wasteload Analysis for this discharge into Mill Creek. It has been determined that this discharge will not cause a violation of water quality standards. The permittee is expected to be able to comply with the permit limitations below.

Reasonable Potential Analysis

Since January 1, 2016, DWQ has conducted reasonable potential analysis (RP) on all new and renewal applications received after that date. RP for this permit renewal was conducted following DWQ's September 10, 2015 Reasonable Potential Analysis Guidance (RP Guidance). There are four outcomes defined in the RP Guidance: Outcome A, B, C, or D. These Outcomes provide a frame work for what routine monitoring or effluent limitations are required. See Attachment 3 for more details.

The permit limitations are:

Parameter	Effluent Limitations *a				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
BOD_5, mg/L	25	35	--	--	--
TSS, mg/L	25	35	--	--	--
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9
TDS, mg/L	--	--	--	--	1,200

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same as in the previous permit. The permit will require reports to be submitted monthly and annually, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Effective January 1, 2017, monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception.

Self-Monitoring and Reporting Requirements *a			
Parameter	Frequency	Sample Type	Units
Total Flow *b, *c	Quarterly	Estimate	MGD
BOD_5	Quarterly	Grab	mg/L
TSS	Quarterly	Grab	mg/L
pH	Quarterly	Grab	SU
Oil & Grease *d	Quarterly/ When Sheen Observed	Grab	mg/L
TDS, mg/L	Quarterly	Grab	mg/L

*a See Definitions, *Part VIII*, for definition of terms.

*b Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

*c If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

*d Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report NA.

STORMWATER

Permit coverage under the Multi Sector General Permit (MSGP) for Storm Water Discharges from Industrial Activities is required based on the Standard Industrial Classification (SIC) code for the facility and the types of industrial activities occurring. If the facility is not already covered, it has 30 days from when this permit is issued to submit the appropriate Notice of Intent (NOI) for the MSGP or exclusion documentation. Previously stormwater discharge requirements and coverage were combined in this individual permit. These have been separated to provide consistency among permittees, electronic reporting for storm water discharge monitoring reports, and increase flexibility to changing site conditions.

Permit coverage under the Construction General Storm Water Permit (CGP) is required for any construction at the facility which disturb an acre or more, or is part of a common plan of development or sale that is an acre or greater. A Notice of Intent (NOI) is required to obtain a construction stormwater permit prior to the period of construction.

Information on storm water permit requirements can be found at http://stormwater.utah.gov

PRETREATMENT REQUIREMENTS

Any wastewater discharged to a POTW, either as a direct discharge or as a hauled waste, is subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of the CWA, the permittee shall comply with all applicable Federal Pretreatment Regulations promulgated at 40 CFR Part 403, the State Pretreatment Requirements at UAC R317-8-8, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with 40 CFR Part 403.12(p)(1), the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if the permittee discharges any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under 40 CFR Part 261. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the Utah Pollutant Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring), dated February 2018. Authority to require effluent biomonitoring is provided in Permit Conditions, UAC R317-8-4.2, Permit Provisions, UAC R317-8-5.3 and Water Quality Standards, UAC R317-2-5 and R317 -2-7.2.

The permittee is a minor municipal facility that will be discharging an infrequent amount of effluent, in which toxicity is neither an existing concern, nor likely to be present. The source of the effluent is culinary water and storm water. Based on these considerations, there is no reasonable potential for toxicity in the permittee's discharge (per State of Utah Permitting and Enforcement Guidance Document for WET Control). As such, there will be no numerical WET limitations or WET monitoring requirements in this permit. However, the permit will contain a toxicity limitation re-opener provision that allows for modification of the permit should additional information indicate the presence of toxicity in the discharge.

PERMIT DURATION

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

Drafted by
Danielle Lenz, Discharge
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Carl Adams, Stormwater
Danielle Lenz, Reasonable Potential Analysis

Christopher Shope, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: May 28, 2021
Ended: June 28, 2021

Comments will be received at: 195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

The Public Noticed draft permit was published on the DEQ webpage.

During the public comment period provided under R317-8-6.5, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments will be considered in making the final decision and shall be answered as provided in R317-8-6.12.

ADDENDUM TO FSSOB

During finalization of the Permit certain dates, spelling edits and minor language corrections were completed. Due to the nature of these changes they were not considered Major and the permit is not required to be re Public Noticed.

Responsiveness Summary

No comments were received during the Public Notice comment period.

DWQ-2021-005454

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ATTACHMENT 1

Effluent Monitoring Data

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Effluent Monitoring Data.

Month	Flow	pH	O & G	TDS	BOD5	TSS
Mar-18	0.005517	7.71	Pass	220	--	6
Jun-18	0.004883	7.89	Pass	240	--	8
Sep-18	0.003527	7.46	Pass	184	--	12
Dec-18	0.00521	7.6	Pass	380	8	4
Mar-19	0.004539	7.82	Pass	664	9	--
Jun-19	0.0058	7.84	Pass	284	--	4
Sep-19	0.005089	7.86	Pass	276	5	--
Dec-19	0.005517	7.84	Pass	464	7	6
Mar-20	0.007233	7.86	Pass	276	22	--
Jun-20	0.007574	7.84	Pass	120	--	--
Sep-20	0.004338	7.81	Pass	376	--	--
Dec-20	0.005036	7.61	Pass	212	5	--

-- : Below Detection

ATTACHMENT 2

Wasteload Analysis

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

Date: **March 18, 2021**

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

Facility: **Fresenius Medical Care**
475 West 13th St, Ogden, UT
UPDES Permit No. UT-0023752

Receiving water: **Plain City Canal (2B, 3E, 4) into Mill Creek (2B, 3D) into Weber River (2B, 3C, 3D, 4)**

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

Discharge

Outfall 001has a design flow rate of 0.0215 MGD, consisting of non-contact cooling water and stormwater. Outfall 001 enters the stormwater infiltration pond. Excess storage from the stormwater infiltration pond exits the pond at Outfall 002, with a design flow rate of 0.0485 MGD and includes stormwater and flow from Outfall 001. The point of compliance remains Outfall 001.

Receiving Water

The receiving water for Outfalls 001 and 002 is a concrete storm drain that conveys water to the Plain City Canal, into Mill Creek, into the Weber River, and into Great Salt Lake

Per UAC R317-2-13, the designated beneficial uses of the affected assessment units in the immediate area are (13.13): “all waters not specifically classified are presumptively classified: 2B, 3D” into (13.4a): “Weber River, from Great Salt Lake to Slaterville diversion, except as listed below: 2B, 3C, 3D, 4”. However, the Plain City Canal can be designated as a tributary to Mill Creek, a stream not specifically classified, an agricultural irrigation canal, or a drainage canal. DWQ believes that the Ogden Nature Center has modified the Plain City Canal into an irrigation canal. Therefore, the designated beneficial uses for the Plain City Canal are (13.9): “All irrigation canals and ditches statewide, except as otherwise designated: 2B, 3E, 4”.

- *Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*

- *Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.*

- *Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*

- *Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.*

- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). The only upstream monitoring data available for the Mill Creek receiving water was located at USGS 0411433111564801 Mill Creek Near Pioneer Power Plant approximately 3.6 miles upstream and used to evaluate ambient or background flow conditions. However, extremely limited flow rate data was available from 1979 and 1980. Since Plain City Canal is considered a water of the state, it is identified as the receiving water. However, no discharge measurements are available. A site inspection of the Plain City Canal on March 10, 2021 at baseflow conditions, exhibited negligible flow. For these reasons, no flow conditions in the receiving water are reasonable and requires that the wasteload analysis compliance point be at Outfall 001.DWQ used a conservative estimate for the annual critical flow in the receiving water at Plain City Canal of 0.001 ft3/s.

Ambient, upstream, background receiving water quality was also interrogated using a combination of data from USGS 0411433111564801 Mill Creek Near Pioneer Power Plant for spring and summer conditions, the previous 2015 wasteload analysis, and visual observations of the receiving water. The average seasonal value was calculated for each constituent, where data was available, in the receiving water. Effluent discharge parameters, where available, were characterized using data supplied in the permit application, the discharge monitoring report (DMR), and the previous 2015 wasteload analysis estimates at monitoring site Outfall 001 (DWQ 4923060).

Total Maximum Daily Load (TMDL)

According to the Utah's 2016 303(d) Water Quality Assessment Report dated December 7, 2016, the receiving water for the discharge, Weber River and tributaries from Great Salt Lake to Slaterville Diversion (UT16020102-001_00) was listed as "Not Supporting" for OE Bioassessment and Total Ammonia with impaired beneficial uses 3C and 3D.

DWQ has not completed a TMDL for OE Bioassessment or Total Ammonia in the Weber River and has set the development priority as "Low".

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and for chronic conditions is 2500 ft, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

The modeled plume width at 15 minutes of travel time or 2 ft is 100% of the river and the plume width at 2500 ft downstream is 100% of the width of the river. Therefore, the plume is considered to be completely mixed. Acute limits were calculated using 50% of the seasonal critical low flow. However, because there is no quantifiable background discharge, there is not a mixing zone.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were determined in consultation with the UPDES Permit Writer, the renewal application, and the industry SIC codes from https://www.osha.gov/data/sic-search. The potential parameters of concern for this facility include: Temperature, TDS, BOD5, metals, and major ions. Utah DWQ evaluated the BOD5 to achieve a minimum DO concentration (DO sag) of 5.0 mg/l according to R317-2.14.2. The BOD5 concentration will remain 25 mg/l, as in the previous wasteload analysis.

WET Limits

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

Table 2: WET Limits for IC_{25}

Outfall	Percent Effluent
Outfall 001	99.1%

Wasteload Allocation Methods

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

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

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

Antidegradation Level I Review

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

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

Documents:

Wasteload Document*: Fresenius_WLA_2021.docx*
Wasteload Analysis and Addendums: *Fresenius_WLA_2021.xlsm*

References:

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

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

Utah Division of Water Quality
Salt Lake City, Utah

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

28-Apr-21
4:00 PM

Facilities: **Fresenius Medical Care** **UPDES No: UT-0023752**
Discharging to: **Storm drain TO Plain City Canal TO Mill Creek**

I. Introduction

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

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

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

II. Receiving Water and Stream Classification

Storm drain TO Plain City Canal TO Mill Creek: 2B, 3C, 3D, 3E, 4
Antidegradation Review: Level I review completed. Level II review is 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)	0.0	mg/l (4 Day Average)
	0.0	mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.0	mg/l (30 Day Average)
	N/A	mg/l (7Day Average)
	3.0	mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0	mg/l

Utah Division of Water Quality
Salt Lake City, Utah

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*	1 Hour Average (Acute) Standard Concentration		Load*
Aluminum	87.00	ug/l**	0.061 lbs/day	750.00	ug/l	0.526 lbs/day
Arsenic	150.00	ug/l	0.105 lbs/day	340.00	ug/l	0.238 lbs/day
Cadmium	1.90	ug/l	0.001 lbs/day	5.57	ug/l	0.004 lbs/day
Chromium III	211.92	ug/l	0.149 lbs/day	4433.71	ug/l	3.108 lbs/day
ChromiumVI	11.00	ug/l	0.008 lbs/day	16.00	ug/l	0.011 lbs/day
Copper	23.85	ug/l	0.017 lbs/day	39.41	ug/l	0.028 lbs/day
Iron				1000.00	ug/l	0.701 lbs/day
Lead	12.88	ug/l	0.009 lbs/day	330.60	ug/l	0.232 lbs/day
Mercury	0.0120	ug/l	0.000 lbs/day	2.40	ug/l	0.002 lbs/day
Nickel	132.13	ug/l	0.093 lbs/day	1188.44	ug/l	0.833 lbs/day
Selenium	4.60	ug/l	0.003 lbs/day	20.00	ug/l	0.014 lbs/day
Silver	N/A	ug/l	N/A lbs/day	25.04	ug/l	0.018 lbs/day
Zinc	303.93	ug/l	0.213 lbs/day	303.93	ug/l	0.213 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 Concentration		Load*	1 Hour Average (Acute) Standard Concentration		Load*
Aldrin				1.500	ug/l	0.001 lbs/day
Chlordane	0.004	ug/l	0.003 lbs/day	1.200	ug/l	0.001 lbs/day
DDT, DDE	0.001	ug/l	0.001 lbs/day	0.550	ug/l	0.000 lbs/day
Dieldrin	0.002	ug/l	0.001 lbs/day	1.250	ug/l	0.001 lbs/day
Endosulfan	0.056	ug/l	0.033 lbs/day	0.110	ug/l	0.000 lbs/day
Endrin	0.002	ug/l	0.001 lbs/day	0.090	ug/l	0.000 lbs/day
Guthion				0.010	ug/l	0.000 lbs/day
Heptachlor	0.004	ug/l	0.002 lbs/day	0.260	ug/l	0.000 lbs/day
Lindane	0.080	ug/l	0.047 lbs/day	1.000	ug/l	0.001 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	0.008 lbs/day	2.000	ug/l	0.001 lbs/day
Pentachlorophenol	13.00	ug/l	7.658 lbs/day	20.000	ug/l	0.014 lbs/day
Toxephene	0.0002	ug/l	0.000 lbs/day	0.7300	ug/l	0.001 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	0.00 lbs/day
Chromium			100.0 ug/l	lbs/day
Copper			200.0 ug/l	lbs/day
Lead			100.0 ug/l	lbs/day
Selenium			50.0 ug/l	lbs/day
TDS, Summer			1200.0 mg/l	0.42 tons/day

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

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

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		Class 3A, 3B	
Toxic Organics	[2 Liters/Day for 70 Kg Person over 70 Yr.]		[6.5 g for 70 Kg Person over 70 Yr.]	
Acenaphthene	ug/l	lbs/day	2700.0 ug/l	1.59 lbs/day
Acrolein	ug/l	lbs/day	780.0 ug/l	0.46 lbs/day
Acrylonitrile	ug/l	lbs/day	0.7 ug/l	0.00 lbs/day
Benzene	ug/l	lbs/day	71.0 ug/l	0.04 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	0.00 lbs/day
Chlorobenzene	ug/l	lbs/day	21000.0 ug/l	12.37 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	0.06 lbs/day

1,1,1-Trichloroethane					
Hexachloroethane	ug/l	lbs/day	8.9	ug/l	0.01 lbs/day
1,1-Dichloroethane					
1,1,2-Trichloroethane	ug/l	lbs/day	42.0	ug/l	0.02 lbs/day
1,1,2,2-Tetrachloroethar	ug/l	lbs/day	11.0	ug/l	0.01 lbs/day
Chloroethane			0.0	ug/l	0.00 lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4	ug/l	0.00 lbs/day
2-Chloroethyl vinyl ethe	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0	ug/l	2.53 lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5	ug/l	0.00 lbs/day
p-Chloro-m-cresol			0.0	ug/l	0.00 lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0	ug/l	0.28 lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0	ug/l	0.24 lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0	ug/l	10.01 lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	1.53 lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	1.53 lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1	ug/l	0.00 lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2	ug/l	0.00 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	0.47 lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0	ug/l	0.02 lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0	ug/l	1.00 lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0	ug/l	1.35 lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1	ug/l	0.01 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	0.00 lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0	ug/l	17.08 lbs/day
Fluoranthene	ug/l	lbs/day	370.0	ug/l	0.22 lbs/day
4-Chlorophenyl phenyl ether					
4-Bromophenyl phenyl ether					
Bis(2-chloroisopropyl) e	ug/l	lbs/day	170000.0	ug/l	100.14 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	0.94 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	0.21 lbs/day
Dichlorobromomethane(	ug/l	lbs/day	22.0	ug/l	0.01 lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0	ug/l	0.02 lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0	ug/l	0.03 lbs/day
Hexachlorocyclopentadi	ug/l	lbs/day	17000.0	ug/l	10.01 lbs/day
Isophorone	ug/l	lbs/day	600.0	ug/l	0.35 lbs/day
Naphthalene					
Nitrobenzene	ug/l	lbs/day	1900.0	ug/l	1.12 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	8.25 lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0	ug/l	0.45 lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1	ug/l	0.00 lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0	ug/l	0.01 lbs/day
N-Nitrosodi-n-propylami	ug/l	lbs/day	1.4	ug/l	0.00 lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2	ug/l	0.00 lbs/day

Phenol	ug/l	lbs/day	4.6E+06	ug/l	2.71E+03 lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9	ug/l	0.00 lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0	ug/l	3.06 lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0	ug/l	7.07 lbs/day
Di-n-octyl phthlate					
Diethyl phthalate	ug/l	lbs/day	120000.0	ug/l	70.69 lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06	ug/l	1.71E+03 lbs/day
Benzo(a)anthracene (P/	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(a)pyrene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(b)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(k)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Chrysene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 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	0.00 lbs/day
Indeno(1,2,3-cd)pyrene	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Pyrene (PAH)	ug/l	lbs/day	11000.0	ug/l	6.48 lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9	ug/l	0.01 lbs/day
Toluene	ug/l	lbs/day	200000	ug/l	117.81 lbs/day
Trichloroethylene	ug/l	lbs/day	81.0	ug/l	0.05 lbs/day
Vinyl chloride	ug/l	lbs/day	525.0	ug/l	0.31 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	0.00 lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.00 lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0	ug/l	0.00 lbs/day
Endrin	ug/l	lbs/day	0.8	ug/l	0.00 lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8	ug/l	0.00 lbs/day
Heptachlor	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Heptachlor epoxide					
PCB's					
PCB 1242 (Arochlor 12	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1254 (Arochlor 12	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1221 (Arochlor 12	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1232 (Arochlor 12	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1248 (Arochlor 12	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1260 (Arochlor 12	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1016 (Arochlor 10	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	2.53 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	129.60 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.00 lbs/day
Nickel			4600.00 ug/l	2.71 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	0.00 lbs/day
Zinc				

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

VII. Mathematical Modeling of Stream Quality

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

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

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

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

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

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

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

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

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

VIII. Modeling Information

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

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

Other Conditions

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

Model Inputs

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

Current Upstream Information

	Stream Critical Low Flow cfs	Temp. Deg. C	pH	T-NH3 mg/l as N	BOD5 mg/l	DO mg/l	TRC mg/l	TDS mg/l
Summer (Irrig. Season)	0.0	14.0	7.3	0.00	1.00	11.29	0.00	650.0
Fall	0.0	12.0	8.1	0.00	1.00	---	0.00	650.0
Winter	0.0	4.0	8.0	0.00	1.00	---	0.00	650.0
Spring	0.0	9.4	8.0	0.00	1.00	---	0.00	650.0

Dissolved Metals	Al ug/l	As ug/l	Cd ug/l	CrIII ug/l	CrVI ug/l	Copper ug/l	Fe ug/l	Pb ug/l
All Seasons	1.59*	0.53*	0.053*	0.53*	2.65*	0.53*	0.83*	0.53*

Dissolved Metals	Hg ug/l	Ni ug/l	Se ug/l	Ag ug/l	Zn ug/l	Boron ug/l		
All Seasons	0.0000	0.53*	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	0.07000	31.3	316.00	0.09222
Fall	0.07000	23.4		
Winter	0.07000	17.7		
Spring	0.07000	25.8		

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	0.070 MGD	0.108 cfs
Fall	0.070 MGD	0.108 cfs
Winter	0.070 MGD	0.108 cfs
Spring	0.070 MGD	0.108 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.07 MGD. If the discharger is allowed to have a flow greater than 0.07 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 >	EOP	Effluent	[Acute]
	IC25 >	99.1%	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	14.6 lbs/day
Fall	25.0 mg/l as BOD5	14.6 lbs/day
Winter	25.0 mg/l as BOD5	14.6 lbs/day
Spring	25.0 mg/l as BOD5	14.6 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	4.9	mg/l as N	2.9	lbs/day
	1 Hour Avg. - Acute	17.5	mg/l as N	10.2	lbs/day
Fall	4 Day Avg. - Chronic	4.4	mg/l as N	2.6	lbs/day
	1 Hour Avg. - Acute	14.3	mg/l as N	8.3	lbs/day
Winter	4 Day Avg. - Chronic	4.6	mg/l as N	2.7	lbs/day
	1 Hour Avg. - Acute	14.6	mg/l as N	8.5	lbs/day
Spring	4 Day Avg. - Chronic	4.4	mg/l as N	2.6	lbs/day
	1 Hour Avg. - Acute	14.3	mg/l as N	8.3	lbs/day

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

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

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

Season		Concentration		Load	
Summer	4 Day Avg. - Chronic	0.011	mg/l	0.01	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.01	lbs/day
Fall	4 Day Avg. - Chronic	0.011	mg/l	0.01	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.01	lbs/day
Winter	4 Day Avg. - Chronic	0.011	mg/l	0.01	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.01	lbs/day
Spring	4 Day Avg. - Chronic	0.011	mg/l	0.00	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.00	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	1205.1	mg/l	0.35	tons/day
Fall	Maximum, Acute	1205.1	mg/l	0.35	tons/day
Winter	Maximum, Acute	1205.1	mg/l	0.35	tons/day
Spring	4 Day Avg. - Chronic	1205.1	mg/l	0.35	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 300 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		756.9	ug/l	0.5	lbs/day
Arsenic	151.38	ug/l	0.1	lbs/day	343.1	ug/l	0.2	lbs/day
Cadmium	1.91	ug/l	0.0	lbs/day	5.6	ug/l	0.0	lbs/day
Chromium III	213.87	ug/l	0.1	lbs/day	4,474.6	ug/l	3.1	lbs/day
Chromium VI	11.06	ug/l	0.0	lbs/day	16.1	ug/l	0.0	lbs/day
Copper	24.07	ug/l	0.0	lbs/day	39.8	ug/l	0.0	lbs/day
Iron	N/A		N/A		1,009.2	ug/l	0.7	lbs/day
Lead	12.99	ug/l	0.0	lbs/day	333.6	ug/l	0.2	lbs/day
Mercury	0.01	ug/l	0.0	lbs/day	2.4	ug/l	0.0	lbs/day
Nickel	133.34	ug/l	0.1	lbs/day	1,199.4	ug/l	0.8	lbs/day
Selenium	4.63	ug/l	0.0	lbs/day	20.2	ug/l	0.0	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	25.3	ug/l	0.0	lbs/day

Zinc	306.74	ug/l	0.1	lbs/day	306.7	ug/l	0.2 lbs/day
Cyanide	5.25	ug/l	0.0	lbs/day	22.2	ug/l	0.0 lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	16.0	Deg. C.	60.8	Deg. F
Fall	14.0	Deg. C.	57.2	Deg. F
Winter	6.0	Deg. C.	42.8	Deg. F
Spring	11.4	Deg. C.	52.6	Deg. F

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

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

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aldrin					1.5E+00	ug/l	1.63E-03	lbs/day
Chlordane	4.30E-03	ug/l	2.51E-03	lbs/day	1.2E+00	ug/l	1.30E-03	lbs/day
DDT, DDE	1.00E-03	ug/l	5.84E-04	lbs/day	5.5E-01	ug/l	5.97E-04	lbs/day
Dieldrin	1.90E-03	ug/l	1.11E-03	lbs/day	1.3E+00	ug/l	1.36E-03	lbs/day
Endosulfan	5.60E-02	ug/l	3.27E-02	lbs/day	1.1E-01	ug/l	1.19E-04	lbs/day
Endrin	2.30E-03	ug/l	1.34E-03	lbs/day	9.0E-02	ug/l	9.76E-05	lbs/day
Guthion	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	1.08E-05	lbs/day
Heptachlor	3.80E-03	ug/l	2.22E-03	lbs/day	2.6E-01	ug/l	2.82E-04	lbs/day
Lindane	8.00E-02	ug/l	4.67E-02	lbs/day	1.0E+00	ug/l	1.08E-03	lbs/day
Methoxychlor	0.00E+00	ug/l	0.00E+00	lbs/day	3.0E-02	ug/l	3.25E-05	lbs/day
Mirex	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	1.08E-05	lbs/day
Parathion	0.00E+00	ug/l	0.00E+00	lbs/day	4.0E-02	ug/l	4.34E-05	lbs/day
PCB's	1.40E-02	ug/l	8.17E-03	lbs/day	2.0E+00	ug/l	2.17E-03	lbs/day
Pentachlorophenol	1.30E+01	ug/l	7.59E+00	lbs/day	2.0E+01	ug/l	2.17E-02	lbs/day
Toxephene	2.00E-04	ug/l	1.17E-04	lbs/day	7.3E-01	ug/l	7.92E-04	lbs/day

Effluent Targets for Pollution Indicators
Based upon Water Quality Standards

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

	1 Hour Average	
	Concentration	Loading
Gross Beta (pCi/l)	50.0 pCi/L	
BOD (mg/l)	5.0 mg/l	3.5 lbs/day
Nitrates as N	4.0 mg/l	2.8 lbs/day
Total Phosphorus as P	0.05 mg/l	0.0 lbs/day
Total Suspended Solids	90.0 mg/l	63.1 lbs/day

Note: Pollution indicator targets are for information purposes only.

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

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

	Maximum Concentration	
	Concentration	**Load**
Toxic Organics		
Acenaphthene	2.72E+03 ug/l	1.59E+00 lbs/day
Acrolein	7.87E+02 ug/l	4.59E-01 lbs/day
Acrylonitrile	6.66E-01 ug/l	3.89E-04 lbs/day
Benzene	7.17E+01 ug/l	4.18E-02 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	4.44E+00 ug/l	2.59E-03 lbs/day
Chlorobenzene	2.12E+04 ug/l	1.24E+01 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	7.77E-04 ug/l	4.54E-07 lbs/day
1,2-Dichloroethane	9.99E+01 ug/l	5.83E-02 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	8.98E+00 ug/l	5.24E-03 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	4.24E+01 ug/l	2.47E-02 lbs/day
1,1,2,2-Tetrachloroethane	1.11E+01 ug/l	6.48E-03 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	1.41E+00 ug/l	8.25E-04 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	4.34E+03 ug/l	2.53E+00 lbs/day
2,4,6-Trichlorophenol	6.56E+00 ug/l	3.83E-03 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	4.74E+02 ug/l	2.77E-01 lbs/day
2-Chlorophenol	4.04E+02 ug/l	2.36E-01 lbs/day
1,2-Dichlorobenzene	1.72E+04 ug/l	1.00E+01 lbs/day
1,3-Dichlorobenzene	2.62E+03 ug/l	1.53E+00 lbs/day

1,4-Dichlorobenzene	2.62E+03 ug/l	1.53E+00 lbs/day
3,3'-Dichlorobenzidine	7.77E-02 ug/l	4.54E-05 lbs/day
1,1-Dichloroethylene	3.23E+00 ug/l	1.89E-03 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	7.97E+02 ug/l	4.65E-01 lbs/day
1,2-Dichloropropane	3.94E+01 ug/l	2.30E-02 lbs/day
1,3-Dichloropropylene	1.72E+03 ug/l	1.00E+00 lbs/day
2,4-Dimethylphenol	2.32E+03 ug/l	1.35E+00 lbs/day
2,4-Dinitrotoluene	9.18E+00 ug/l	5.36E-03 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	5.45E-01 ug/l	3.18E-04 lbs/day
Ethylbenzene	2.93E+04 ug/l	1.71E+01 lbs/day
Fluoranthene	3.73E+02 ug/l	2.18E-01 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	1.72E+05 ug/l	1.00E+02 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	1.61E+03 ug/l	9.43E-01 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	3.63E+02 ug/l	2.12E-01 lbs/day
Dichlorobromomethane(HM)	2.22E+01 ug/l	1.30E-02 lbs/day
Chlorodibromomethane (HM)	3.43E+01 ug/l	2.00E-02 lbs/day
Hexachlorocyclopentadiene	1.72E+04 ug/l	1.00E+01 lbs/day
Isophorone	6.06E+02 ug/l	3.53E-01 lbs/day
Naphthalene		
Nitrobenzene	1.92E+03 ug/l	1.12E+00 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	1.41E+04 ug/l	8.25E+00 lbs/day
4,6-Dinitro-o-cresol	7.72E+02 ug/l	4.51E-01 lbs/day
N-Nitrosodimethylamine	8.17E+00 ug/l	4.77E-03 lbs/day
N-Nitrosodiphenylamine	1.61E+01 ug/l	9.43E-03 lbs/day
N-Nitrosodi-n-propylamine	1.41E+00 ug/l	8.25E-04 lbs/day
Pentachlorophenol	8.28E+00 ug/l	4.83E-03 lbs/day
Phenol	4.64E+06 ug/l	2.71E+03 lbs/day
Bis(2-ethylhexyl)phthalate	5.95E+00 ug/l	3.48E-03 lbs/day
Butyl benzyl phthalate	5.25E+03 ug/l	3.06E+00 lbs/day
Di-n-butyl phthalate	1.21E+04 ug/l	7.07E+00 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	1.21E+05 ug/l	7.07E+01 lbs/day
Dimethyl phthlate	2.93E+06 ug/l	1.71E+03 lbs/day
Benzo(a)anthracene (PAH)	3.13E-02 ug/l	1.83E-05 lbs/day
Benzo(a)pyrene (PAH)	3.13E-02 ug/l	1.83E-05 lbs/day
Benzo(b)fluoranthene (PAH)	3.13E-02 ug/l	1.83E-05 lbs/day
Benzo(k)fluoranthene (PAH)	3.13E-02 ug/l	1.83E-05 lbs/day
Chrysene (PAH)	3.13E-02 ug/l	1.83E-05 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	3.13E-02 ug/l	1.83E-05 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	3.13E-02 ug/l	1.83E-05 lbs/day

Pyrene (PAH)	1.11E+04 ug/l	6.48E+00 lbs/day
Tetrachloroethylene	8.98E+00 ug/l	5.24E-03 lbs/day
Toluene	2.02E+05 ug/l	1.18E+02 lbs/day
Trichloroethylene	8.17E+01 ug/l	4.77E-02 lbs/day
Vinyl chloride	5.30E+02 ug/l	3.09E-01 lbs/day
Pesticides		
Aldrin	1.41E-04 ug/l	8.25E-08 lbs/day
Dieldrin	1.41E-04 ug/l	8.25E-08 lbs/day
Chlordane	5.95E-04 ug/l	3.48E-07 lbs/day
4,4'-DDT	5.95E-04 ug/l	3.48E-07 lbs/day
4,4'-DDE	5.95E-04 ug/l	3.48E-07 lbs/day
4,4'-DDD	8.48E-04 ug/l	4.95E-07 lbs/day
alpha-Endosulfan	2.02E+00 ug/l	1.18E-03 lbs/day
beta-Endosulfan	2.02E+00 ug/l	1.18E-03 lbs/day
Endosulfan sulfate	2.02E+00 ug/l	1.18E-03 lbs/day
Endrin	8.17E-01 ug/l	4.77E-04 lbs/day
Endrin aldehyde	8.17E-01 ug/l	4.77E-04 lbs/day
Heptachlor	2.12E-04 ug/l	1.24E-07 lbs/day
Heptachlor epoxide		
PCB's		
PCB 1242 (Arochlor 1242)	4.54E-05 ug/l	2.65E-08 lbs/day
PCB-1254 (Arochlor 1254)	4.54E-05 ug/l	2.65E-08 lbs/day
PCB-1221 (Arochlor 1221)	4.54E-05 ug/l	2.65E-08 lbs/day
PCB-1232 (Arochlor 1232)	4.54E-05 ug/l	2.65E-08 lbs/day
PCB-1248 (Arochlor 1248)	4.54E-05 ug/l	2.65E-08 lbs/day
PCB-1260 (Arochlor 1260)	4.54E-05 ug/l	2.65E-08 lbs/day
PCB-1016 (Arochlor 1016)	4.54E-05 ug/l	2.65E-08 lbs/day
Pesticide		
Toxaphene	7.57E-04 ug/l	4.42E-07 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)	1.41E-08 ug/l	8.25E-12 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		756.9				756.9	N/A
Antimony				4339.7		4339.7	
Arsenic	100.9	343.1			0.0	100.9	151.4
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	10.1	5.6			0.0	5.6	1.9
Chromium (III)		4474.6			0.0	4474.6	213.9
Chromium (VI)	100.9	16.1			0.0	16.11	11.06
Copper	201.8	39.8				39.8	24.1
Cyanide		22.2	222031.6			22.2	5.2
Iron		1009.2				1009.2	
Lead	100.9	333.6			0.0	100.9	13.0
Mercury		2.42		0.15	0.0	0.15	0.012
Nickel		1199.4		4642.5		1199.4	133.3
Selenium	50.4	20.2			0.0	20.2	4.6
Silver		25.3			0.0	25.3	
Thallium				6.4		6.4	
Zinc		306.7				306.7	306.7
Boron	756.9					756.9	

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	756.9	N/A	
Antimony	4339.71		
Arsenic	100.9	151.4	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	5.6	1.9	
Chromium (III)	4474.6	214	
Chromium (VI)	16.1	11.1	

Copper	39.8	24.1
Cyanide	22.2	5.2
Iron	1009.2	
Lead	100.9	13.0
Mercury	0.151	0.012
Nickel	1199.4	133
Selenium	20.2	4.6
Silver	25.3	N/A
Thallium	6.4	
Zinc	306.7	306.7
Boron	756.93	

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 Level II Review is not required.

XI. Colorado River Salinity Forum Considerations

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

XII. Summary Comments

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

XIII. Notice of UPDES Requirement

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

Utah Division of Water Quality
801-538-6052
File Name: Fresenius_WLA_2021.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
2.000	0.000	0.803	20.000	20.000	12.487	0.400	0.087

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	1.607	0.000	0.000	32.000	10.059

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.286

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

Antidegredation Review

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

DWQ-2021-005443

ATTACHMENT 3

Reasonable Potential Analysis

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REASONABLE POTENTIAL ANALYSIS

Water Quality has worked to improve our reasonable potential analysis (RP) for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in the renewal permit. A Copy of the Reasonable Potential Analysis Guidance (RP Guide) is available at Water Quality. There are four outcomes for the RP Analysis[1]. They are;

Outcome A: A new effluent limitation will be placed in the permit.
Outcome B: No new effluent limitation. Routine monitoring requirements will be placed or increased from what they are in the permit,
Outcome C: No new effluent limitation. Routine monitoring requirements maintained as they are in the permit,
Outcome D: No limitation or routine monitoring requirements are in the permit.

Initial screening of data submitted through the discharge monitoring reports showed that a closer look at limit parameters is not needed.

[1] See Reasonable Potential Analysis Guidance for definitions of terms

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