

**FACT SHEET AND STATEMENT OF BASIS
CASTLE VALLEY SPECIAL SERVICE DISTRICT, CASTLE DALE LAGOONS
RENEWAL PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0023663
MINOR MUNICIPAL**

FACILITY CONTACTS

Person Name: Jacob Sharp, P.E.
Position: District Manager
Phone Number: (435) 381-5333

Facility Name: Castle Dale Lagoons
Mailing and Facility Address: Castle Valley Special Service District
PO Box 877
20 South 100 East,
Castle Dale, Utah 84513

Telephone: (435) 381-5333
Actual Address: Just Southeast of Castle Dale City off Hwy 10 in Emery County

DESCRIPTION OF FACILITY

Castle Valley Special Service District (CVSSD) operates the Castle Dale Lagoons (Castle Dale) domestic wastewater treatment facility. The facility is a four-cell, flow-thru lagoon system serving the population of Castle Dale and Orangeville Cities with no significant industrial users on the system. The first cell is the largest followed by 3 smaller cells and then 3 alternating sand filters. The first cells are mechanically aerated with multiple aerators currently in service. The outfall is located after the final lagoon cell and the 3 sand filters into Cottonwood Creek. The facility is an intermittent discharger based on seasonal loading and precipitation events with discharges occurring 2-3 times each year on average. The lagoon has an average monthly design capacity of 0.7 million gallon per day (MGD).

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

1. Reasonable Potential Analysis

During the permit cycle, Water Quality has worked to improve our reasonable potential analysis (RP) for parameters to have limits included by using an EPA provided model. The results of the RP Analysis are included in Attachment 4 of the FSSOB. Huntington is a minor discharger with no known industrial dischargers with a low reasonable potential for toxics to be in the effluent, therefore they are not required to monitor metals, and RP is not required to be run on their effluent at this time. If and when this changes, metals monitoring may be added to the permit.

2. TBPEL Rule

Water Quality adopted UAC R317-1-3.3, Technology-Based Phosphorus Effluent Limit (TBPEL) Rule on December 16, 2014. No TBPEL will be instituted for discharging treatment lagoons. Instead, each discharging lagoon was evaluated to determine the current annual average total phosphorus load measured in pounds per year based on monthly average flow rates and concentrations. Absent field data to determine these loads, and in case of intermittent discharging lagoons, the phosphorus load cap will be estimated by the Director.

The TBPEL discharging treatment works are required to implement, at a minimum, monthly monitoring of the following beginning July 1, 2015:

R317-1-3.3, E, 1, a. Influent for total phosphorus (as P) and total Kjeldahl nitrogen (as N) concentrations;

R317-1-3.3, E, 1, b. Effluent for total phosphorus and orthophosphate (as P), ammonia, nitrate-nitrite and total Kjeldahl nitrogen (an N);

In R317-1-3.3, E, 3 the rule states that all monitoring shall be based on 24-hour composite samples by use of an automatic sampler or a minimum of four grab samples collected a minimum of two hours apart.

A cap of 125% of the current annual total phosphorus load has been established and is referred to as phosphorus loading cap. It is the intent of *UAC R317-3.3.B* to provide capacity for growth within your facility's service area by setting the loading cap at 125 percent of your current annual total phosphorus load. Castle Dale's current annual total phosphorus load was calculated based on the data reported on your monthly discharge monitoring reports. The Castle Dale phosphorus loading cap is 324 lbs/year and went into effect July 1, 2018.

Once the lagoon's phosphorus loading cap has been reached, the owner of the facility will have five years to construct treatment processes or implement treatment alternatives to prevent the total phosphorus loading cap from being exceeded.

The permit effluent limits will incorporate the following change as a result of the phosphorus loading cap:

Parameter	Effluent Limitations				
	Maximum Monthly Avg	Maximum Weekly Avg	lbs./Year	Daily Minimum	Daily Maximum
Total Phosphorus, lbs	-	-	324	-	-

3. Critical Low Flow in the WLA

The critical low flow used in the permit has reduced from 1.1 cfs to 0.3 cfs. This has resulted in a reduction in the chronic limits for ammonia and acute limit for total residual chlorine limit (TRC). The changes in the limits are summarized in the table below.

Changes in Effluent Limits				
Parameter	Previous Limit		New Limit	
	Maximum Monthly Avg	Daily Maximum	Maximum Monthly Avg	Daily Maximum
Total Ammonia (as N), mg/L				
Summer (Jul-Sep)	6.8	-	4.3	-
Fall (Oct-Dec)	8.3	-	4.7	-
Winter (Jan-Mar)	6.8	-	4.7	-
Spring (Apr-Jun)	8.8	-	4.8	-
TRC, mg/L	-	0.06	-	0.024

4. Total Residual Chlorine

The TRC limit is based on the acute TRC water quality standard at end-of-pipe. This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved TRC methods. The Division has determined the current acceptable ML to be .06 mg/L and the method detection limit (MDL) to be 0.02 mg/L when using the DPD colorimetric Method #4500 – CL G. Measured values greater than or equal to the ML of .06 mg/l will be considered violations of the permit, and values less than the ML of .06 mg/l will be considered to be in compliance with the permit. For purposes of calculating averages and reporting on the Discharge Monitoring Report form, the following will apply:

- 1) analytical values less than 0.02 mg/L shall be considered zero; and
- 2) analytical values less than .06 mg/L and equal to or greater than .02 mg/L will be recorded as measured.

DISCHARGE

DESCRIPTION OF DISCHARGE

Castle Dale has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis. Castle Dale is an intermittent discharger based on seasonal loading and precipitation events with discharges occurring 2-3 times each year on average. There have been no violations or discharges since 2005.

Outfall	Description of Discharge Point
001	Located at latitude 39°11'30" and longitude 111°00'30". The discharge is through sand filter beds and by pipe to Cottonwood Creek.

RECEIVING WATERS AND STREAM CLASSIFICATION

If a discharge were to occur, it would be by gravity flow to Cottonwood Creek, which is part of the San Rafael and Colorado River systems. Cottonwood Creek is classified a Class 2B, 3C, and 4 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 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS

Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD5), *E. coli*, pH and percent removal for BOD5 and TSS are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. The oil and grease is based on best professional judgment (BPJ). Attached is a Wasteload Analysis for this discharge into the unnamed irrigation ditch. It has been determined that this discharge will not cause a violation of water quality standards. An Antidegradation Level II review is not required since the Level I review shows that water quality impacts are minimal. The permittee is expected to be able to comply with these limitations. :

The TDS concentration limit of 3500 mg/L is based upon the approved Total Maximum Daily Load

(TMDL) study for the San Rafael River watershed (which includes Cottonwood Creek), in which a site specific criterion was developed for TDS and can be found in Table A-12 of the document entitled, “Price River, San Rafael River, and Muddy Creek TMDLs for Total Dissolved Solids, West Colorado Watershed Management Unit, Utah”, EPA Approval Date: August 4, 2004.

Total dissolved solids (TDS) limitations are based upon Utah Water Quality Standards for concentration values and the Colorado River Basin Salinity Control Forum (CRBSCF) for mass loading values when applicable as authorized in *UAC R317-2-4*. CRBSCF has established a policy for the reasonable increase of salinity for municipal discharges to any portion of the Colorado River stream system that has an impact on the lower main stem. The CRBSCF Policy entitled “NPDES Permit Program Policy for Implementation of Colorado River Salinity Standards” (Policy), with the most current version dated October 2017, states that the incremental increase in salinity shall be 400 mg/L or less, which is considered to be a reasonable incremental increase above the flow weighted average salinity of the intake water supply. The permittee previously requested a salt loading (TDS) of 1 ton/day, or 366 tons/year in lieu of the requirement that the effluent not exceeding the culinary source water intake by more than 400 mg/L of TDS, which is in allowable under CRBSCF Policy.

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.

A qualitative RP check was performed on the pollutants of concern to determine if there was enough data to perform a reasonable potential analysis on the outfall. Castle Dale is a minor discharger with no known industrial dischargers and a low reasonable potential for toxics to be present in the effluent, therefore they have not been required to monitor metals, and RP is not required to be run on their effluent at this time. If and when this changes, metals monitoring may be added to the permit.

The permit limitations are

Parameter	Effluent Limitations ¹				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow	0.7	-	-	-	-
BOD ₅ , mg/L	25	35	-	-	-
BOD ₅ Min. % Removal	85	-	-	-	-
TSS, mg/L	25	35	-	-	-
TSS Min. % Removal	85	-	-	-	-
Dissolved Oxygen, mg/L	-	-	-	5.0	-
Total Ammonia (as N), mg/L					
Summer (Jul-Sep)	4.3	-	-	-	9.5
Fall (Oct-Dec)	4.7	-	-	-	9.1
Winter (Jan-Mar)	4.7	-	-	-	9.3
Spring (Apr-Jun)	4.8	-	-	-	9.1
TDS, mg/L	-	-	-	-	3500
TRC, mg/L ²	-	-	-	-	0.024

¹ See Definitions, Part VIII, for definition of terms.

Parameter	Effluent Limitations ¹				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
<i>E. coli</i> , No./100mL	126	157	-	-	-
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9
Mass Loading Limits					
Parameter	Maximum Monthly Avg	Maximum Weekly Avg	Year	Daily Minimum	Daily Maximum
Total Phosphorus, lbs	-	-	324	-	-
TDS, Ton/Day ³	-	-	-	-	1
Tons/Year	-	-	366	-	-

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are updated from 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. Lab sheets for biomonitoring must be attached to the biomonitoring DMR. Lab sheets for metals and toxic organics must be attached to the DMRs.

Self-Monitoring and Reporting Requirements ¹			
Parameter	Frequency	Sample Type	Units
Total Flow ^{4, 5}	Continuous	Recorder	MGD
BOD ₅ , Influent ⁶	Twice Monthly	Composite	mg/L
Effluent	Twice Monthly	Composite	mg/L
TSS, Influent ⁶	Twice Monthly	Composite	mg/L
Effluent	Twice Monthly	Composite	mg/L
<i>E. coli</i>	Twice Monthly	Grab	No./100mL
pH	Twice Monthly	Grab	SU
Total Ammonia (as N)	How Often?	Composite	mg/L
DO	Twice Monthly	Grab	mg/L
TRC, mg/L, ⁷	Daily, if chlorinating	Grab	mg/L
Oil & Grease ⁸	When Sheen Observed	Visual, Grab	mg/L
TDS, mg/L	Twice Monthly	Grab	mg/L
TDS, Daily Ton ⁹	Annually	Calculate	Ton/Day

² Analytical results less than 0.06 mg/l will not be considered out of compliance with the permit. For purposes of calculating averages and reporting on the Discharge Monitoring Report form, the following will apply:

- 1) Analytical values less than 0.02 mg/L shall be considered zero; and
- 2) Analytical values less than 0.06 mg/L and equal to or greater than 0.02 mg/L will be recorded as measured.

³ The salt loading (TDS) limit is 1 ton/day, or 366 tons/year.

⁴ 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

⁵ If the rate of discharge is controlled, the rate and duration of discharge shall be reported

⁶ 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

⁷ Total residual chlorine monitoring frequency is Daily, but only if the facility is chlorinating the effluent during monitoring period. If not chlorinating, report NA

⁸ Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report NA

TDS, Total Ton	Annually	Calculate	Ton/Year
Orthophosphate (as P), ¹⁰ Effluent	Monthly	Composite	mg/L
Total Phosphorus (as P), ¹⁰ Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Total Kjeldahl Nitrogen TKN (as N), ¹⁰ Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Nitrate, NO ₃ ¹⁰	Monthly	Composite	mg/L
Nitrite, NO ₂ ¹⁰	Monthly	Composite	mg/L

BIOSOLIDS

The State of Utah has adopted the 40 CFR 503 federal regulations for the disposal of sewage sludge (biosolids) by reference. However, since this facility is a lagoon, there is not any regular sludge production. Therefore 40 CFR 503 does not apply at this time. In the future, if the sludge needs to be removed from the lagoons and is disposed in some way, the Division of Water Quality must be contacted prior to the removal of the sludge to ensure that all applicable state and federal regulations are met

STORM WATER

STORMWATER REQUIREMENTS

Because the design flow is less than 1.0 MGD a storm water UPDES permit is not required. Therefore, storm water permit provisions have not been included with the permit renewal. However, at any time during the lifetime of this permit it may be re-opened and modified, following proper administrative procedures as per UAC R317-8, to include any applicable storm water provisions and requirements.

PRETREATMENT REQUIREMENTS

The permittee has not been designated for pretreatment program development because it does not meet conditions which necessitate a full program. The flow through the plant is less than five (5) MGD, there are no known categorical industries discharging to the treatment facility, and there is no indication of pass through or interference with the operation of the treatment facility such as upsets or violations of the POTW's UPDES permit limits.

Although the permittee does not have to develop a State-approved Pretreatment Program, any wastewater discharges to the sanitary sewer are subject to Federal, State and local 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.

⁹ In addition to the total dissolved solids (TDS) effluent concentration limitation, TDS effluent loading is limited to one-ton/day. If the one-ton/day effluent loading limitation cannot be met, then the permittee is limited to 366-tons/year total TDS effluent loading from the facility. It is the responsibility of the permittee to maintain annual TDS loading information and upon request the permittee shall submit to the Director the annual TDS loading information

¹⁰ These reflect changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule

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. 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 required that the permittee submit for review any local limits that are developed to the Division of Water Quality for review. If local limits are developed it is required 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.

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 infrequently discharging a minimal amount of effluent, in which toxicity is neither an existing concern, nor likely to be present. 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
Daniel Griffin, Discharge, Biosolids, Reasonable Potential Analysis
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Lisa Stevens, Storm Water
Nick von Stackelberg, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: June 10, 2020

Ended: July 10, 2020

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

The Public Noticed of the draft permit was published in the Emery County Progress.

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.

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.

No Comments were received regarding this permit.

DWQ-2020-009762

ATTACHMENT 1

Industrial Waste Survey

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Industrial Pretreatment Wastewater Survey



Do you periodically experience any of the following treatment works problems:

- foam, floaties or unusual colors
- plugged collection lines caused by grease, sand, flour, etc.
- discharging excessive suspended solids, even in the winter
- smells unusually bad
- waste treatment facility doesn't seem to be treating the waste right

Perhaps the solution to a problem like one of these may lie in investigating the types and amounts of wastewater entering the sewer system from industrial users.

An industrial user (IU) is defined as a non-domestic user discharging to the waste treatment facility which meets any of the following criteria:

1. **has a lot of process wastewater (5% of the flow at the waste treatment facility or more than 25,000 gallons per work day.)**

Examples: Food processor, dairy, slaughterhouse, industrial laundry.

2. **is subject to Federal Categorical Pretreatment Standards;**

Examples: metal plating, cleaning or coating of metals, blueing of metals, aluminum extruding, circuit board manufacturing, tanning animal skins, pesticide formulating or packaging, and pharmaceutical manufacturing or packaging,

3. **is a concern to the POTW.**

Examples: septage hauler, restaurant and food service, car wash, hospital, photo lab, carpet cleaner, commercial laundry.

All users of the water treatment facility are **prohibited** from making the following types of discharges:

1. A discharge which creates a fire or explosion hazard in the collection system.
2. A discharge which creates toxic gases, vapor or fumes in the collection system.
3. A discharge of solids or thick liquids which creates flow obstructions in the collection system.
4. An acidic discharge (low pH) which causes corrosive damage to the collection system.
5. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause problems in the collection system or at the waste treatment facility.
6. Waste haulers are prohibited from discharging without permission. (No midnight dumping!)

When the solution to a sewer system problem may be found by investigating the types and amounts of wastewater entering the sewer system discharged from IUs, it's appropriate to conduct an Industrial Waste Survey.

An Industrial Waste Survey consists of:

Step 1: Identify Industrial Users

Make a list of all the commercial and industrial sewer connections.

Sources for the list:

business license, building permits, water and wastewater billing, Chamber of Commerce, newspaper, telephone book, yellow pages.

Split the list into two groups:

domestic wastewater only--no further information needed
everyone else (IUs)

Step 2: Preliminary Inspection

Go visit each IU identified on the "everybody else" list.

Fill out the **Preliminary Inspection Form** during the site visit.

Step 3: Informing the State

Please fax or send a copy of the Preliminary inspection form (both sides) to:

Jennifer Robinson

Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, UT 84114-4870

Phone: (801) 536-4383
Fax: (801) 536-4301
E-mail: jenrobinson@utah.gov

PRELIMINARY INSPECTION FORM

INSPECTION DATE ___ / ___ /

Name of Business _____ **Person Contacted** _____
Address _____ **Phone Number** _____

Description of Business _____

Principal product or service: _____

Raw Materials used: _____

Production process is: Batch Continuous Both

Is production subject to seasonal variation? yes no

If yes, briefly describe seasonal production cycle.

This facility generates the following types of wastes (check all that apply):

- | | |
|--|--|
| 1. <input type="checkbox"/> Domestic wastes | (Restrooms, employee showers, etc.) |
| 2. <input type="checkbox"/> Cooling water, non-contact | 3. <input type="checkbox"/> Boiler/Tower blowdown |
| 4. <input type="checkbox"/> Cooling water, contact | 5. <input type="checkbox"/> Process |
| 6. <input type="checkbox"/> Equipment/Facility wash-down | 7. <input type="checkbox"/> Air Pollution Control Unit |
| 8. <input type="checkbox"/> Storm water runoff to sewer | 9. <input type="checkbox"/> Other describe |

Wastes are discharged to (check all that apply):

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> Sanitary sewer | <input type="checkbox"/> Storm sewer |
| <input type="checkbox"/> Surface water | <input type="checkbox"/> Ground water |
| <input type="checkbox"/> Waste haulers | <input type="checkbox"/> Evaporation |
| <input type="checkbox"/> Other (describe) | |

Name of waste hauler(s), if used

Is a grease trap installed? Yes No

Is it operational? Yes No

Does the business discharge a lot of process wastewater?

- | | | |
|---|-----|----|
| • More than 5% of the flow to the waste treatment facility? | Yes | No |
| • More than 25,000 gallons per work day? | Yes | No |

Does the business do any of the following:

- | | |
|---|--|
| <input type="checkbox"/> Adhesives | <input type="checkbox"/> Car Wash |
| <input type="checkbox"/> Aluminum Forming | <input type="checkbox"/> Carpet Cleaner |
| <input type="checkbox"/> Battery Manufacturing | <input type="checkbox"/> Dairy |
| <input type="checkbox"/> Copper Forming | <input type="checkbox"/> Food Processor |
| <input type="checkbox"/> Electric & Electronic Components | <input type="checkbox"/> Hospital |
| <input type="checkbox"/> Explosives Manufacturing | <input type="checkbox"/> Laundries |
| <input type="checkbox"/> Foundries | <input type="checkbox"/> Photo Lab |
| <input type="checkbox"/> Inorganic Chemicals Mfg. or Packaging | <input type="checkbox"/> Restaurant & Food Service |
| <input type="checkbox"/> Industrial Porcelain Ceramic Manufacturing | <input type="checkbox"/> Septage Hauler |
| <input type="checkbox"/> Iron & Steel | <input type="checkbox"/> Slaughter House |
| <input type="checkbox"/> Metal Finishing, Coating or Cleaning | |
| <input type="checkbox"/> Mining | |
| <input type="checkbox"/> Nonferrous Metals Manufacturing | |
| <input type="checkbox"/> Organic Chemicals Manufacturing or Packaging | |
| <input type="checkbox"/> Paint & Ink Manufacturing | |
| <input type="checkbox"/> Pesticides Formulating or Packaging | |
| <input type="checkbox"/> Petroleum Refining | |
| <input type="checkbox"/> Pharmaceuticals Manufacturing or Packaging | |
| <input type="checkbox"/> Plastics Manufacturing | |
| <input type="checkbox"/> Rubber Manufacturing | |
| <input type="checkbox"/> Soaps & Detergents Manufacturing | |
| <input type="checkbox"/> Steam Electric Generation | |
| <input type="checkbox"/> Tanning Animal Skins | |
| <input type="checkbox"/> Textile Mills | |

Are any process changes or expansions planned during the next three years? Yes No
If yes, attach a separate sheet to this form describing the nature of planned changes or expansions.

Inspector

Waste Treatment Facility

Please send a copy of the preliminary inspection form (both sides) to:

**Jennifer Robinson
Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870**

**Phone: (801) 536-4383
Fax: (801) 536-4301
E-Mail: jenrobinson@utah.gov**

	Industrial User	Jurisdiction	SIC Codes	Categorical Standard Number	Total Average Process Flow (gpd)	Total Average Facility Flow (gpd)	Facility Description
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

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ATTACHMENT 2

Effluent Monitoring Data

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ATTACHMENT 3

Wasteload Analysis

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

Date: April 16, 2020

Facility: Castle Dale Wastewater Treatment Facility
Castle Valley Special Service District
UPDES No. UT0026663

Receiving water: Cottonwood Creek (2B, 3C, 4)

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

Discharge

Outfall 001: Cottonwood Creek

The maximum daily design discharge is 0.95 MGD and the maximum monthly design discharge is 0.70 MGD for the facility.

Effluent parameters were characterized using data from monitoring site 4930900 Castle Dale Lagoons Outfall.

Receiving Water

The receiving water for Outfall 001 is Cottonwood Creek, which is tributary to Huntington Creek, which drains to the San Rafael River and the Colorado River.

Per UAC R317-2-13.1(b), the designated beneficial uses for Cottonwood Creek from confluence with Huntington Creek to Highway U-57 crossing are 2B, 3C and 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 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Due to a lack of flow records

Utah Division of Water Quality
Wasteload Analysis
Castle Dale Wastewater Treatment Facility
UPDES No. UT0026663

for Cottonwood Creek, the 20th percentile of flow measurements taken upstream of the outfall at the Highway U-10 crossing was calculated to estimate annual critical flow in the receiving water (Table 1).

Table 1: Annual critical low flow for Cottonwood Creek at U-10 crossing

Season	Flow (cfs)
Annual	0.3

Receiving water quality data were obtained from monitoring site 4930930 Cottonwood Creek at U-10 Crossing in Castle Dale. The average seasonal value was calculated for each constituent with available data in the receiving water.

Mixing Zone

Per UAC R317-2-5, a discharge is considered instantaneously fully mixed if the discharge is more than twice the ambient flow. Therefore, no mixing zone is granted for this discharge.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were total suspended solids (TSS), dissolved oxygen (DO), BOD₅, total phosphorus (TP), total nitrogen (TN), total ammonia (NH₃-N), E. coli, pH, and total residual chlorine (TRC) as determined in consultation with the UPDES Permit Writer.

TMDL

Cottonwood Creek from the confluence with Huntington Creek to Highway 57 was listed as impaired for pH according to the 303(d) list in *Utah's 2016 Integrated Report*. The San Rafael River downstream of the confluence with Cottonwood Creek is listed as impaired for benthic macroinvertebrates.

Per UAC R317-2-14, Cottonwood Creek from the confluence with Huntington Creek to U-57 has a site specific criterion for TDS concentration of 3,500 mg/L that is based upon the EPA approved Total Maximum Daily Load (TMDL) *Price River, San Rafael River, and Muddy Creek TMDLs for Total Dissolved Solids, West Colorado Watershed Management Unit, Utah* (MFG Inc., 2004).

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC₅₀ (lethal concentration, 50%) percent effluent for acute toxicity and the IC₂₅ (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC₅₀ is typically 100% effluent and does not need to be determined by the WLA.

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Table 2: WET Limits for IC₂₅

Season	Percent Effluent
Annual	78%

Water Quality Modeling

Effluent limits for conservative pollutants were determined using a mass balance mixing analysis (UDWQ 2012). The inputs and results of the mass balance analysis is summarized in Appendix A.

The water quality standard for chronic ammonia toxicity is dependent on temperature and pH, and the water quality standard for acute ammonia toxicity is dependent on pH. The AMMTOX Model developed by University of Colorado and adapted by Utah DWQ and EPA Region VIII was used to determine ammonia effluent limits (Lewis et al. 2002). The analysis is summarized in Appendix B.

The effluent limits for DO and BOD₅ in order to meet minimum DO criteria in the receiving water was evaluated using the Utah River Model. The analysis is summarized in Appendix B.

The limits for total residual chlorine were determined assuming a decay rate of 20 /day (at 20 °C) and a travel time of 8.3 minutes in the outlet pipe prior to discharge to Cottonwood Creek (approximately 1000 linear feet at 0.5 feet per second velocity). The analysis for TRC is summarized in Appendix C.

Model and supporting documentation are available for review upon request.

Effluent Limits

Select WQBELs are summarized in Table 3. The complete list of WQBELs is attached in the appendices.

Table 3: Water Quality Based Effluent Limits Summary

Effluent Constituent	Acute			Chronic		
	Standard	Limit	Averaging Period	Standard	Limit	Averaging Period
Flow (MGD)		0.95	1 day		0.70	30 days
Ammonia (mg/L)			1 hour			30 days
Summer (Jul-Sep)	9.7	16.1		2.7	4.3	
Fall (Oct-Dec)	9.7	15.4		3.1	4.7	
Winter (Jan-Mar)	9.7	14.8		3.1	4.7	
Spring (Apr-Jun)	9.7	15.9		3.1	4.8	
BOD ₅ (mg/L)	N/A	35	7 days	N/A	25	30 days
Dissolved Oxygen (mg/L)	3.0	5.0	Minimum	5.0	5.0	30 days
Total Dissolved Solids (mg/L)	3,500	3,500	Maximum			
Total Residual Chlorine (mg/L)	0.019	0.024	1 hour	0.011	0.016	4 days

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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 discharge since the pollutant concentration and load is not increasing under this permit renewal.

**Prepared by:
Nicholas von Stackelberg, P.E.
Watershed Protection Section**

Documents:

WLA Document: *CastleDaleWLA_2020-04-16.docx*

Wasteload Analysis: *CastleDaleWLA_2020.xlsm*

References:

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

Utah Division of Water Quality. 2016. *Utah's 2016 Integrated Report*.

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.

MFG Inc. 2004. *Price River, San Rafael River, and Muddy Creek TMDLs for Total Dissolved Solids, West Colorado Watershed Management Unit, Utah*. Utah Division of Water Quality.

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WASTELOAD ANALYSIS [WLA]

Date: 4/16/2020

Appendix A: Mass Balance Mixing Analysis for Conservative Constituents

Discharging Facility: Castle Dale Lagoons
 UPDES No: UT-0026663
 Permit Flow [MGD]: 0.95 Annual Max. Daily
 0.70 Annual Max. Monthly

Receiving Water: Cottonwood Creek
 Stream Classification: 2B, 3C, 4
 Stream Flows [cfs]: 0.30 All Seasons Critical Low Flow

Fully Mixed: YES
 Acute River Width: 100%
 Chronic River Width: 100%

Modeling Information

A simple mixing analysis was used to determine the effluent limits.

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

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 reflect the environmental conditions expected at low stream flows.

Effluent Limitations for Protection of Recreation (Class 2B Waters)

No dilution in unnamed irrigation ditch.

Physical

Parameter	Maximum Concentration
pH Minimum	6.5
pH Maximum	9.0
Turbidity Increase (NTU)	10.0

Bacteriological

E. coli (30 Day Geometric Mean)	206 (#/100 mL)
E. coli (Maximum)	668 (#/100 mL)

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Effluent Limitations for Protection of Aquatic Wildlife (Assumed Class 3C Waters)

Inorganics	Chronic Standard (4 Day Average)		Acute Standard (1 Hour Average)
	Parameter	Standard	Standard
Phenol (mg/L)			0.010
Hydrogen Sulfide (Undissociated) [mg/L]			0.002

Metals-Total Recoverable

Parameter	Chronic (4-day ave)			Acute (1-hour ave)		
	Standard ¹	Background	Limit	Standard ¹	Background	Limit
Aluminum (µg/L)	N/A ³	242.3	N/A	750.0	242.3	853.6
Arsenic (µg/L)	150.0	0.9	191.3	340.0	0.9	409.2
Cadmium (µg/L)	2.4	0.05	3.0	7.4	0.05	8.9
Chromium III (µg/L)	11.0	2.0	13.5	16.0	2.0	18.9
Chromium VI (µg/L)	268.2	2.0	342.0	5,612	2.0	6,757
Copper (µg/L)	30.5	1.9	38.4	51.7	1.9	61.8
Cyanide (µg/L) ²	5.2	3.5	5.7	22.0	3.5	25.8
Iron (µg/L)				1,000	23.0	1,199
Lead (µg/L)	18.6	0.3	23.6	477	0.3	574
Mercury (µg/L) ²	0.012	0.008	0.013	2.4	0.008	2.9
Nickel (µg/L)	168.5	3.2	214.4	1,516	3.2	1,825
Selenium (µg/L)	4.6	0.5	5.7	18.4	0.5	22.0
Silver (µg/L)				41.1	0.3	49.4
Tributyltin (µg/L) ²	0.072	0.048	0.079	0.46	0.048	0.54
Zinc (µg/L)	387.8	6.5	493.5	387.8	6.5	465.7

1: Based upon a hardness of 400 mg/l as CaCO₃

2: Background concentration assumed 67% of chronic standard

3: Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaCO₃ in the receiving water after mixing, the 87 ug/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 ug/L acute aluminum criterion (expressed as total recoverable).

Organics [Pesticides]

Parameter	Chronic (4-day ave)		Acute (1-hour ave)	
	Standard	Limit	Standard	Limit
Aldrin (µg/L)			1.5	1.5
Chlordane (µg/L)	0.0043	0.0043	1.2	1.2
DDT, DDE (µg/L)	0.001	0.001	0.55	0.55
Diazinon (µg/L)	0.17	0.17	0.17	0.17
Dieldrin (µg/L)	0.0056	0.0056	0.24	0.24
Endosulfan, a & b (µg/L)	0.056	0.056	0.11	0.11
Endrin (µg/L)	0.036	0.036	0.086	0.086
Heptachlor & H. epoxide (µg/L)	0.0038	0.0038	0.26	0.26
Lindane (µg/L)	0.08	0.08	1.0	1.0
Methoxychlor (µg/L)			0.03	0.03
Mirex (µg/L)			0.001	0.001
Nonylphenol (µg/L)	6.6	6.6	28.0	28.0
Parathion (µg/L)	0.0130	0.0130	0.066	0.066
PCB's (µg/L)	0.014	0.014		
Pentachlorophenol (µg/L)	15.0	15.0	19.0	19.0
Toxephene (µg/L)	0.0002	0.0002	0.73	0.73

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Radiological	Parameter	Maximum Concentration Standard
	Gross Alpha (pCi/L)	15

Effluent Limitation for Protection of Agriculture (Class 4 Waters)

Parameter	Maximum Concentration			
	Standard	Background	Limit	
Total Dissolved Solids (mg/L)	3,500	3,500	3,500	Site specific standard
Boron (µg/L)	750	83.4	935	
Arsenic, Dissolved (µg/L)	100	0.9	127	
Cadmium, Dissolved (µg/L)	10	0.1	13	
Chromium, Dissolved (µg/L)	100	2.0	127	
Copper, Dissolved (µg/L)	200	1.9	255	
Lead, Dissolved (µg/L)	100	0.3	128	
Selenium, Dissolved (µg/L)	50	0.5	64	
Gross Alpha (pCi/L)	15	0.0	19	

WASTELOAD ANALYSIS [WLA]

Date: 4/16/2020

Appendix B: Utah Stream DO and AMMTOX Models

Discharging Facility: Castle Dale Lagoons
 UPDES No: UT-0026663
 Permit Flow [MGD]: 0.70 Annual Max. Daily
 0.95 Annual Max. Monthly

Receiving Water: Cottonwood Creek
 Stream Classification: 2B, 3C, 4
 Stream Flows [cfs]: 0.3 All Seasons Critical Low Flow

Fully Mixed: YES
 Acute River Width: 100%
 Chronic River Width: 100%

Modeling Information

The modeling approach used in this analysis included 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) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

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.

All model numerical inputs, intermediate calculations, outputs and graphs are available for review and comment at the Division of Water Quality.

Model Input

Current Upstream Information

Season	Critical Low							
	Flow cfs	Temp. Deg. C	pH Ave	pH Max	NH3 mg/L as N	BOD5 mg/l	DO mg/l	
Summer	0.3	16.8	8.20	8.40	0.02	1.60	6.79	
Fall	0.3	4.6	8.20	8.40	0.02	1.60	9.48	
Winter	0.3	5.9	8.20	8.40	0.02	1.60	10.05	
Spring	0.3	14.3	8.20	8.40	0.02	1.60	7.48	

Season	Org N	NO3
	mg/L as N	mg/L as N
Summer	0.25	0.32
Fall	0.25	0.32
Winter	0.25	0.32
Spring	0.25	0.32

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Projected Discharge Information

Season	Flow (MGD)		Temp.	pH	pH	Org N	NO3
	Max Daily	Ave Monthly	Deg. C	Ave	Max	mg/L as N	mg/L as N
Summer	1.0	0.7	16.5	7.60	7.70	0.75	1.09
Fall	1.0	0.7	11.4	7.60	7.70	0.75	1.09
Winter	1.0	0.7	8.6	7.60	7.70	0.75	1.09
Spring	1.0	0.7	12.4	7.60	7.70	0.75	1.09

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 reflect the environmental conditions expected at low stream flows.

Effluent Limitations for Protection of Aquatic Wildlife (Assumed Class 3C Waters)

Temperature (deg C)	Maximum
Instantaneous	27.0
Change	4.0

pH	Concentration
Minimum	6.5
Maximum	9.0

Dissolved Oxygen (mg/L)	Standard	Limit
Instantaneous Minimum	3.0	5.0
30-day Average Minimum	5.0	5.0

CBOD5 (mg/L)	Standard	Limit
Daily Maximum	N/A	35.0
30-day Average	N/A	25.0

Ammonia-Total (mg/L)	Chronic (30-day ave)			Acute (1-hour ave)			
	Season	Standard	Background	Limit	Standard	Background	Limit
Summer		2.7	0.02	4.3	9.7	0.02	16.1
Fall		3.1	0.02	4.7	9.7	0.02	15.4
Winter		3.1	0.02	4.7	9.7	0.02	14.8
Spring		3.1	0.02	4.8	9.7	0.02	15.9

Model Rate Parameters and Coefficients

CBOD	CBOD	REAER.	REAER.	NBOD	NBOD		
Kd(20)	Kd(T)	Ka(20)	Ka(T)	Kn(20)	Kn(T)		
/day	/day	/day	/day	/day	/day		
1.00	0.85	20.0	18.4	1.00	0.77		
NH3	NH3	NO3	NO3	BENTHIC	BENTHIC		
LOSS	LOSS	LOSS	LOSS	DEMAND	DEMAND		
K5(20)	K5(T)	K6(20)	K6(T)	SOD(20)	SOD(T)		
/day	/day	/day	/day	gm/m2/day	gm/m2/day		
3.00	2.56	0.25	0.21	1.00	0.80		
Kd	Ka	Kn	K4	K5	K6	KCI	SOD
CBOD	Reaer.	NH3	Open	NH3 Loss	NO2+3	TRC	Benthic
{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}
1.047	1.024	1.08	1	1.047	1.045	1.06	1.065

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WASTELOAD ANALYSIS [WLA]
Appendix C: Total Residual Chlorine

Date: 4/16/2020

Discharging Facility: Castle Dale Lagoons
 UPDES No: UT-0026663

CHRONIC

Decay Rate (/day)

	Season	Receiving Water	Standard	Total Effluent	Mixing Zone Boundary	Effluent Limit Without Decay	Temperature (°C)	@ 20 deg C	@ T deg C	Travel Time (min)	Decay Coefficient	Effluent Limit
Discharge (cfs)	Annual	0.3		1.1	1.4							
TRC (mg/L)	Annual	0.000	0.011			0.014	20.0	20	20.0	8.333333	0.89	0.016

ACUTE

Decay Rate (/day)

	Season	Receiving Water	Standard	Total Effluent	Mixing Zone Boundary	Effluent Limit Without Decay	Temperature (°C)	@ 20 °C	@ T °C	Travel Time (min)	Decay Coefficient	Effluent Limit
Discharge (cfs)	Annual	0.2		1.5	1.6							
TRC (mg/L)	Annual	0.000	0.019			0.021	20.0	20	20.0	8.333333	0.89	0.024

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ATTACHMENT 4

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 Analysis¹¹. 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.

Castle Dale is a minor discharger with no known industrial dischargers with a low reasonable potential for toxics to be in the effluent, therefore they are not required to monitor metals, and RP is not required to be run on their effluent at this time. If and when this changes, metals monitoring may be added to the permit.

¹¹ See Reasonable Potential Analysis Guidance for definitions of terms