

Official Draft Public Notice Version **March 29, 2024**

The findings, determinations, and assertions contained in this document are not final and subject to change following the public comment period.

**FACT SHEET AND STATEMENT OF BASIS
SPRINGDALE WASTEWATER LAGOONS
RENEWAL PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0025224
MINOR MUNICIPAL**

FACILITY CONTACTS

Permittee: Town of Springdale (Springdale)
Person Name: Barbara Bruno
Position: Mayor

Person Name: Rick Wixom
Position: City Manager

Person Name: Robert Totten
Position: Public Works Superintendent
Phone Number: (435) 243-3686

Facility Name: Springdale Wastewater Lagoons
Mailing and Facility Address: Springdale City Offices
PO Box 187
118 Lion Blvd
Springdale, Utah 84767
Telephone: (435) 772-6907

DESCRIPTION OF FACILITY

The Springdale Wastewater Lagoons (Facility) are located in Springdale, Washington County, Utah, and serve the towns of Springdale and Rockville, as well as Zion National Park, with the outfall located at latitude 37°09'45" and longitude 113°04'17". The design capacity is 0.29 million gallons a day (MGD), population equivalent of 4,500, but present flow averages 0.25 MGD.

The facility has a grinder, two aerated primary cells, and one secondary cell for sedimentation and clarification. The effluent is treated with ultraviolet (UV) light for disinfection. The total surface area of the lagoons is 19.38 acres and has a capacity of 52 million gallons. Due to compliance issues, the Facility is upgrading its headworks to include a powered screen to remove non-volatile solids from entering the lagoon system. A sand filtration system is also being constructed to help further reduce the level of total suspended solids (TSS). An updated compliance schedule for the completion of the abovementioned upgrades is included in the permit.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

Sampling and Limitations:

Ammonia sampling was changed to a twice monthly composite sample. An Oil and Grease limitation was added to be consistent with other permits. Boron was removed as enough data was collected to support the ongoing Total Daily Maximum Load (TMDL) work.

Compliance Schedule:

Springdale has requested an extension of the Compliance Schedule for Lagoon Upgrade found in the previous permit, specifically related to total suspended solids (TSS) and biochemical oxygen demand (BOD₅). The Division of Water Quality (DWQ) has approved this request, as Springdale is in the process of coming into compliance with their permit. This approval has been incorporated into this permit renewal as stipulated below:

Lagoon Upgrade	
Date	Milestone
November 1, 2024	Construction Completed and Approved by DWQ
December 1, 2024	Final Effluent Limitations in Effect

TSS			
Date	TSS Max. Monthly Average	TSS Max. Weekly Average	TSS Min. % Removal
Permit Issue – November 30, 2024	70 mg/L	70 mg/L	No limitation
December 1, 2024	45 mg/L	65 mg/L	85%

BOD₅			
Date	BOD Max. Monthly Average	BOD Max. Weekly Average	BOD Min. % Removal
Permit Issue – November 30, 2024	70 mg/L	70 mg/L	No limitation
December 1, 2024	45 mg/L	65 mg/L	85%

DISCHARGE

DESCRIPTION OF DISCHARGE

The wastewater treatment plant has one discharge point, Outfall 001. The discharge flows through an eight-inch green PVC pipe discharging directly to the Virgin River. The approximate average flow over the last five years is 0.268 MGD.

Springdale has been reporting self-monitoring results on Discharge Monitoring Reports (DMRs) on a monthly basis. There have been violations of TSS since the permit modification in October 2022. Effluent monitoring and compliance data information is available for public review at www.echo.epa.gov.

<u>Outfall</u>	<u>Description of Discharge Point</u>
001	Located at latitude 37° 09' 45" and longitude 113° 04' 17". An 8-inch green PVC pipe discharges directly to the Virgin River.

RECEIVING WATERS AND STREAM CLASSIFICATION

The Virgin River is classified as a Class 1C, 2B, 3C and 4 according to *Utah Administrative Code (UAC) R317-2-13*:

- Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water
- Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.
- Class 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.

TOTAL MAXIMUM DAILY LOAD (TMDL) REQUIREMENTS

According to the Utah's Final 2022 Integrated Report on Water Quality dated December 9, 2022, the receiving water for the discharge, "Virgin River and tributaries from North Creek confluence to North Fork Virgin River (Assessment Unit UT15010008-012_00)" was listed as "No Evidence of Impairment". Furthermore, downstream Assessment Unit (UT15010008-011_00) "Virgin River and tributaries from Quail Creek Diversion to North Creek confluence" was listed as "Fully Supporting".

BASIS FOR EFFLUENT LIMITATIONS

Effluent limitations on TSS, BOD₅, *E. coli*, pH, and percent removal for BOD₅ and TSS are based on current Utah Secondary Treatment Standards, Utah Administrative Code (UAC) R317-1-3.2. The Oil and Grease is based on best professional judgment (BPJ). Effluent limitations for flow and dissolved oxygen (DO) are based on the wasteload analysis (WLA).

Total phosphorus effluent limits are based on UAC R 317-1-3.3, TBPEL Rule. 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. Springdale's phosphorus loading cap is 3,490 lbs/year. If the lagoon's phosphorus loading cap has been reached, Springdale will have five years to construct treatment processes or implement treatment alternatives to prevent the total phosphorus loading cap from being exceeded. The TBPEL Rules also require additional monitoring; see Monitoring Table and associated footnotes for details.

Total dissolved solids (TDS) limitations are based upon Utah Water Quality Standards 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 2020, 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.

Attached is a Wasteload Analysis for this discharge into the Virgin River. 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.

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 framework for what routine monitoring or effluent limitations are required.

Springdale has not monitored for metals in the past. As a result, there is no data to evaluate in a RP analysis. Springdale does not have an approved pretreatment program, does not have any industrial users contributing pollutants, and has a discharge that is less than 1 MGD and is therefore not required to sample metals according to the UPDES Pretreatment Guidance for Sampling POTWs. Therefore, there is a low probability of RP for metals to cause a violation of a WQBEL or subsequent downstream water quality standard for the Virgin River as a result of discharge.

The permit limitations are:

Parameter	Table 1: Effluent Limitations at Outfall 001 ^(a)				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow	0.29	--	--	--	--
BOD ₅ , mg/L ^(b)	45	65	--	--	--
BOD ₅ Min. % Removal ^(b)	85	--	--	--	--
TSS, mg/L ^(b)	45	65	--	--	--
TSS Min. % Removal ^(b)	85	--	--	--	--
Dissolved Oxygen, mg/L	--	--	--	4.0	--
<i>E. coli</i> , No./100mL	126	157	--	--	--
Total Phosphorus, lbs/year	--	--	3,490	--	--
pH, Standard Units	--	--	--	6.5	9
TDS, mg/L ^(c)	<400 Increase	--	--	--	--

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same for Outfall 001 as in the previous permit, with the exception of boron, ammonia, and oil and grease. Boron was removed based on data collected during the

previous permit cycle. Ammonia was reduced to twice monthly composite sample. Oil and Grease was added to be consistent with all permits. 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.

Parameter	Frequency	Sample Type	Units
Total Flow ^{(d)(e)}	Continuous	Recorder	MGD
BOD ₅ ^{(f)(b)}			
Influent	2 x Monthly	Composite	mg/L
Effluent	2 x Monthly	Composite	mg/L
TSS ^{(f)(b)}			
Influent	2 x Monthly	Composite	mg/L
Effluent	2 x Monthly	Composite	mg/L
Dissolved Oxygen	2 x Monthly	Grab	mg/L
<i>E. coli</i>	2 x Monthly	Grab	No./100mL
pH	2 x Monthly	Grab	SU
TDS ^(c) , Effluent	Quarterly	Grab	
Source Water	Quarterly	Grab	mg/L
Temperature ^(g)	2 x Monthly	Grab	°F
Total Ammonia (as N)	2 x Monthly	Composite	mg/L
Oil & Grease ^(h)	When Sheen Observed	Grab	mg/L
Orthophosphate (as P) ⁽ⁱ⁾ Effluent	Monthly	Composite	mg/L
Total Phosphorus (as P) ⁽ⁱ⁾			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Total Kjeldahl Nitrogen, TKN (as N) ⁽ⁱ⁾			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Nitrate, NO ₃ ⁽ⁱ⁾	Monthly	Composite	mg/L
Nitrite, NO ₂ ⁽ⁱ⁾	Monthly	Composite	mg/L

Notes Tables 1 and 2

- a. See Definitions, *Part VIII*, for definition of terms.
- b. Interim limit effective through November 30, 2024. See Part I.C.3 of the permit.
- c. The effluent shall not exceed the culinary source water intake by more than 400 mg/L of TDS or the permittee could request 1 ton/day TDS loading or 366 tons/year.
- d. 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.
- e. If the rate of discharge is controlled, the rate and duration of discharge shall be reported.
- f. In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for effluent discharge. During months where a discharge will not occur, influent samples shall be taken and analyzed at the frequency stipulated in **Table 2**.
- g. Temperature is being sampled in support of work being done for the TMDL currently underway for the Virgin River. This pollutant of concern (POC) will be monitored and reported on a monthly basis by the facility on

DMRs but will not have a limit associated with it. If the Permittee decides to sample more frequently for this POC, the additional data will be welcome.

- h. Oil and grease shall be sampled when sheen is present or visible. If no sheen is present or visible, report NA.
- i. These reflect changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.

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

Separate storm water permits may be required based on the types of activities occurring on site.

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. Treatment Works treating domestic sewage or any other sewage sludge or wastewater treatment device, system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design floe on 1.0 million gallons per day (MGD) or more, or required to have an approved pretreatment program un 40 CFR Part 403. Springdale does not meet any of the above criteria.

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 storm water permit prior to the period of construction.

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

PRETREATMENT REQUIREMENTS

Springdale has not been designated for an Approved POTW Pretreatment Program (Program) because it does not meet the conditions that necessitate the Program. The flow through the plant is less than five (5) MGD and no Significant Industrial Users are discharging to the treatment facility.

Although Springdale does not have to develop a Program, any wastewater discharged by an Industrial User to the sanitary sewer is subject to Federal, State and local regulations. Pursuant to Section 307 of the Clean Water Act, Springdale 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.

The Industrial Users discharging to the Publicly Owned Treatment Works (POTW) include commercial users, restaurants, auto facilities, Zion National Park and hotels. There is a potential concern regarding

loading to the facility; therefore, outreach will occur to determine if Industrial Users are impacting the POTW.

Part II of the permit states that an industrial waste survey (IWS) is required. The IWS is to assess the need for pretreatment assistance. If an Industrial User begins to discharge or an existing Industrial User changes their discharge, Springdale 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 Springdale submit for review any Local Limits that are developed to protect the POTW to the Division of Water Quality for review. If Local Limits are developed, it is required that Springdale 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 discharging an infrequent amount of effluent, in which toxicity is neither an existing concern, nor likely to be present. Based on these considerations, and the absence of receiving stream water quality monitoring data, 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 and Reviewed by
Lindsay Cowles, Discharge Permit Writer
Daniel Griffin, Biosolids
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Carl Adams, Storm Water
Amy Dickey, TMDL/Watershed
Christopher Shope, PhD, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: Month Day, Year
Ended: Month Day, Year

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 on the DWQ 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

(Explain any comments received and response sent. Actual letters can be referenced, but not required to be included).

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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
P.O. 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 washdown | 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
P. O. 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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PV Draft

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: December 1, 2023

Prepared by: Christopher L. Shope
Standards and Technical Services

Facility: Springdale Wastewater Lagoons
UPDES Permit No. UT-0025224

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: direct discharge to Virgin River at 0.29 MGD design flow.

Receiving Water

The effluent discharges directly into the Virgin River between Rockland, UT and Virgin, UT.

Per UAC R317-2-13.4, the designated beneficial uses *Virgin River and tributaries, from the Quail Creek diversion to headwaters, except as listed below* are: 1C,2B,3C,4.

- *Class 1C – Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.*
- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*
- *Class 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.*

**Utah Division of Water Quality
Wasteload Analysis
Springdale Wastewater Lagoons, UPDES Permit No. UT-0025224**

Flow

Typically, the critical flow for the receiving water in a wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten-year return frequency (7Q10). Daily in-stream flow records were analyzed from USGS 09406000: VIRGIN RIVER AT VIRGIN, UT monitoring location. The annual 7Q10 critical flow value for the Virgin River at this location is 71.86 ft³/s. Receiving water quality was characterized using data from DWQ Monitoring Station DWQ 4950850: VIRGIN R 1 MI E OF VIRGIN for the period 2000-2023.

Both of the above monitoring stations are below the Springdale Wastewater Lagoons discharge location. However, review of available stations and associated data led to the conclusion that they are the most appropriate sites to characterize the receiving water. Upstream stations on the Virgin River are upstream of the confluence with major tributaries (East Fork of the Virgin River). Upstream water quality and discharge data were infrequently collected and have not been monitored for many years. Discharge data from Springdale Wastewater Lagoons indicate that they discharge on a very intermittent basis (on the order of 4 times per year). Additionally, the lagoon discharge rate (0.45 ft³/s) is very small compared to the receiving water flow (even at annual critical low flow of 71.86 ft³/s). Given these factors, it is unlikely that downstream data is significantly influenced by the lagoon discharge.

Total Maximum Daily Load (TMDL)

According to the Utah's [Final 2022 Integrated Report on Water Quality](#) dated December 9, 2022, the receiving water for the discharge, "Virgin River and tributaries from North Creek confluence to North Fork Virgin River (Assessment Unit UT15010008-012_00)" was listed as "No Evidence of Impairment". Furthermore, downstream Assessment Unit (UT15010008-011_00) "Virgin River and tributaries from Quail Creek Diversion to North Creek confluence" was listed as "Fully Supporting"

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

Individual mixing zones may be disallowed in consideration of site-specific factors. For the site location, biologically important areas such as fish spawning/nursery areas or segments with occurrences of federally listed threatened or endangered species may be present (R317-2-5.1.b.). According to US Fish and Wildlife Service (US FWS), endangered species downstream and possibly within this area include, Virgin River Chub (*Gila seminuda*) and Woundfin (*Plagopterus argentissimus*). Because the critical habitat of these species is potentially affected, authorized additional study may be required from agencies including but not limited to US EPA, US FWS, Utah Division of Wildlife Resources. In addition, early life species (ELS) are present at least January through August in this reach of Virgin River. Therefore, no mixing zone is granted for this effluent discharge point source. Water quality standards must be met at the end of pipe (EOP).

Further special studies commissioned by the permittee would be required to support inclusion of a dilution credit through the addition of a mixing zone.

**Utah Division of Water Quality
Wasteload Analysis
Springdale Wastewater Lagoons, UPDES Permit No. UT-0025224**

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were determined in consultation with the UPDES Permit Writer, the Utah Water Quality Assessment Reports, and the industry SIC codes from <https://www.osha.gov/data/sic-search>. The potential parameters of concern for this facility include: Temperature, TDS, TSS, pH, dissolved oxygen, total ammonia, BOD, phosphorous, nitrogen, TRC, toxic organics, metals, and major ions.

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.

WET limits for Outfall 001 for IC₂₅ should be based on 0.9% effluent.

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 Utah Rivers Model was used to evaluate the DO sag and implications on nutrients and BOD. The 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. To evaluate effluent discharge water quality, the Springdale Lagoons discharge monitoring report (DMR) was used. Background temperature and pH values from the Virgin River were used in the analysis.

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. The proposed permit is a renewal with no additional flow or concentration of pollutants over those authorized for the Virgin River.

Documents:

WLA Document: *231201-Springdale_Lagoon_WLA_2023.docx*
Wasteload Analysis and Addendums: *231201-Springdale_Lagoon_WLA_2023.xlsm*

References:

Utah Division of Water Quality

Wasteload Analysis

Springdale Wastewater Lagoons, UPDES Permit No. UT-0025224

Utah Division of Water Quality. 2022. Final 2022 Integrated Report on Water Quality.

<https://documents.deq.utah.gov/water-quality/monitoring-reporting/integrated-report/DWQ-2022-002386.pdf>

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>

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

1-Dec-23
4:00 PM

Facilities: Springdale Lagoons
Discharging to: Virgin River

UPDES No: UT-UT0025224

I. Introduction

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

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

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

II. Receiving Water and Stream Classification

Virgin River: 1C,2B,3C,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)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	N/A 5.0 mg/l (30 Day Average) mg/l (7Day Average) 3.0 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

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

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(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	Temp.	pH	T-NH3	BOD5	DO	TRC	TDS
	cfs	Deg. C		mg/l as N	mg/l	mg/l	mg/l	mg/l
Summer (Irrig. Season)	51.4	22.5	8.2	0.04	2.50	6.79	0.00	509.1
Fall	70.9	10.3	8.2	0.03	2.50	---	0.00	504.5
Winter	103.7	7.8	8.2	0.03	2.50	---	0.00	504.5
Spring	64.0	16.5	8.3	0.04	2.50	---	0.00	504.5

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	0.29000	23.8	1541.00	1.86316
Fall	0.29000	11.2		
Winter	0.29000	18.6		
Spring	0.29000	12.0		

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

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

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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	0.290 MGD	0.449 cfs
Fall	0.290 MGD	0.449 cfs
Winter	0.290 MGD	0.449 cfs
Spring	0.290 MGD	0.449 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.29 MGD. If the discharger is allowed to have a flow greater than 0.29 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occurring, the permit writers must include the discharge flow limitation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 > IC25 >	2.9% Effluent 0.9% Effluent	[Acute] [Chronic]	Receiving Water Flow (cfs)	Effluent Flow (MGD)	Effluent Flow (cfs)	Combined Flow (cfs)	Totally Mixed	Chronic	Acute
									IC25 % Effluent	LC50 % Effluent
Season										
Summer				51.41	0.3	0.4	51.9	NO	0.9%	0.1%
Fall				70.86	0.3	0.4	71.3	NO	0.6%	0.0%
Winter				103.71	0.3	0.4	104.2	NO	0.4%	0.0%
Spring				64.00	0.3	0.4	64.4	NO	0.7%	0.0%

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	35.0 mg/l as BOD5	84.6 lbs/day
Fall	35.0 mg/l as BOD5	84.6 lbs/day
Winter	35.0 mg/l as BOD5	84.6 lbs/day
Spring	35.0 mg/l as BOD5	84.6 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	4.00
Fall	4.00
Winter	4.00
Spring	4.00

Effluent Limitation for Total Ammonia based upon Water Quality Standards

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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	104.9 mg/l as N	253.7 lbs/day
	1 Hour Avg. - Acute	222.1 mg/l as N	537.1 lbs/day
Fall	4 Day Avg. - Chronic	138.5 mg/l as N	334.9 lbs/day
	1 Hour Avg. - Acute	309.2 mg/l as N	747.7 lbs/day
Winter	4 Day Avg. - Chronic	238.9 mg/l as N	577.7 lbs/day
	1 Hour Avg. - Acute	519.9 mg/l as N	1,257.3 lbs/day
Spring	4 Day Avg. - Chronic	153.0 mg/l as N	370.0 lbs/day
	1 Hour Avg. - Acute	340.5 mg/l as N	823.4 lbs/day

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

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

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

Season		Concentration	Load
Summer	4 Day Avg. - Chronic	1.157 mg/l	2.80 lbs/day
	1 Hour Avg. - Acute	1.050 mg/l	2.54 lbs/day
Fall	4 Day Avg. - Chronic	1.590 mg/l	3.85 lbs/day
	1 Hour Avg. - Acute	1.440 mg/l	3.48 lbs/day
Winter	4 Day Avg. - Chronic	2.323 mg/l	5.62 lbs/day
	1 Hour Avg. - Acute	2.099 mg/l	5.08 lbs/day
Spring	4 Day Avg. - Chronic	1.437 mg/l	3.48 lbs/day
	1 Hour Avg. - Acute	1.303 mg/l	3.15 lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season	Concentration	Load
Summer	Maximum, Acute	80372.7 mg/l
Fall	Maximum, Acute	80900.0 mg/l
Winter	Maximum, Acute	82035.7 mg/l
Spring	4 Day Avg. - Chronic	86478.5 mg/l

Colorado Salinity Forum Limits Determined by Permitting Section

**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:

	Concentration	1 Hour Average
		Loading
Gross Beta (pCi/l)	50.0 pCi/L	
BOD (mg/l)	5.0 mg/l	12.1 lbs/day
Nitrates as N	4.0 mg/l	9.7 lbs/day
Total Phosphorus as P	0.05 mg/l	0.1 lbs/day
Total Suspended Solids	90.0 mg/l	217.7 lbs/day

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Acute

INPUT

	Summer	Fall	Winter	Spring
pH:	8.23	8.21	8.16	8.27
Beneficial use classification:	3C	3C	3C	3C

OUTPUT

	Summer	Fall	Winter	Spring
Total ammonia nitrogen criteria (mg N/L):				
Acute (Class 3A):	3.588	3.782	4.113	3.329
Acute (Class 3B, 3C, 3D):	5.372	5.663	6.158	4.984

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Chronic

INPUT				
	Summer	Fall	Winter	Spring
Temperature (deg C):	22.50	10.29	7.81	16.52
pH:	8.23	8.21	8.16	8.27
Are fish early life stages present?	Yes	Yes	Yes	Yes
OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Chronic - Fish Early Life Stages Present:	1.017	1.777	1.903	1.404
Chronic - Fish Early Life Stages Absent:	1.017	2.333	2.933	1.404

ATTACHMENT 4

Reasonable Potential Analysis

PND Draft

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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 Analysis¹. 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.

A quantitative RP was not performed on effluent metals data because there is inadequate data for use in a RP.

¹ See Reasonable Potential Analysis Guidance for definitions of terms