

**FACT SHEET
SAND HOLLOW GROUNDWATER TREATMENT PLANT
RENEWAL PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0026131
MINOR INDUSTRIAL**

FACILITY CONTACTS

Operator Name:	Washington County Water Conservancy District
Person Name:	Jordan Jones
Position:	Supervisor
Phone Number:	(435) 637-3617

Permittee Name:	Washington County Water Conservancy District
Facility Name:	Sand Hollow Groundwater Treatment Plant
Mailing and Facility Address:	533 East Waterworks Drive St. George, Utah 84770
Telephone:	(435) 637-3617
Actual Address:	Sand Hollow Road, Washington County

DESCRIPTION OF FACILITY

The Sand Hollow Groundwater Treatment Plant (Facility) is a drinking water facility designed primarily to treat arsenic and manganese in raw groundwater. Arsenic and other contaminants are removed by a dual-media filter. The main treatment process involves pre-oxidation with chlorine, coagulation (ferric chloride), and pressure filtration with sand and anthracite media and air scour capabilities, followed by post-chlorination. Backwash flows are pumped to a backwash clarifier. Water within the clarifier is decanted and returned to the front of the plant. Wastewater from filter backwashing is pumped into solar drying beds. Periodically, the sludge in the tank bottom is removed through a blowdown process and pumped to the drying beds for further processing. Water within the drying beds is primarily removed through evaporation. However, if water production exceeds the evaporation rate, decanted water will be discharged to the west dam drain to Sand Hollow Reservoir. Dried Sludge will be removed and hauled to a local landfill. The discharge is not expected to be year-round, but only during periods of low evaporation and high water production.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

The Facility requested an increase in flow, which was incorporated into this Permit. Whole effluent toxicity (WET) testing is now required in this Permit due to the increased flow. Self-monitoring for biochemical oxygen demand (BOD₅), total suspended solids (TSS), dissolved oxygen (DO), total residual chlorine (TRC), E.coli, pH, total dissolved solids (TDS), total arsenic, total manganese, and total iron sampling frequency was changed to every discharge since discharge is anticipated to only occur three times per year.

TDS sample collection methods were updated to be consistent with other UPDES permits; they are now Grab samples.

DISCHARGE

DESCRIPTION OF DISCHARGE

The Facility is a groundwater treatment plant. The Facility maintains a UPDES Permit in the event that a discharge from their Facility is necessary. The Facility only discharged 3 times during the previous Permit cycle.

<u>Outfall</u>	<u>Description of Discharge Point</u>
001	Located at latitude 37° 06' 52.0" and longitude 113° 23' 18.0". Intermittent discharge of decant water from drying beds flows to an 8" pipe Northeast of the Facility to Sand Hollow Reservoir.

RECEIVING WATERS AND STREAM CLASSIFICATION

The receiving water for Outfall 001 is directly into Sand Hollow Reservoir. Per Utah Administrative Code (UAC) R317-2-13.12., the designated beneficial uses for Sand Hollow Reservoir are 1C, 2A, 3B, and 4.

- | | |
|-------------|--|
| Class 1C -- | Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water. |
| Class 2A -- | Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing. |
| Class 3B -- | Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain. |
| Class 4 -- | Protected for agricultural uses including irrigation of crops and stock watering. |

Per UAC R317-2-8, Protection of Downstream Uses, all actions to control waste discharges under these rules shall be modified as necessary to protect downstream designated uses.

TOTAL MAXIMUM DAILY LOAD (TMDL) REQUIREMENTS

According to the Utah's [Final 2024 Integrated Report on Water Quality](#) dated April 30, 2024 (UDWQ, 2024), the receiving water for Outfall 001 discharge "*Sand Hollow Reservoir* (AU name: *Sand Hollow Reservoir*, AU ID: *UT-L-15010008-025_00*)" was listed as "No Evidence of Impairment". The receiving waters do not have an approved TMDL for any parameters.

BASIS FOR EFFLUENT LIMITATIONS

In accordance with regulations promulgated in 40 Code of Federal Regulations Part 122.44 and UAC R317-8-4.2, effluent limitations are derived from technology-based effluent limitations guidelines, Utah Secondary Treatment Standards (UAC R317-1-3.2) or Utah Water Quality Standards (UAC R317-2) as applicable. In cases where multiple limits have been developed, those that are more stringent apply. In cases where no limits or multiple limits have been developed, Best Professional Judgment (BPJ) of the Permitting authority may be used where applicable. BPJ refers to a discretionary, best professional decision made by the Permit writer based upon precedent, prevailing regulatory standards, or other relevant information.

Permit limits can also be derived from the wasteload analysis (WLA), which incorporates Secondary Treatment Standards, Water Quality Standards, including any applicable TMDL impairments, Antidegradation Reviews (ADR), and designated uses into a water quality model that projects the effects of discharge concentrations on receiving water quality. Effluent limitations are those that the model demonstrates are sufficient to meet State water quality standards in the receiving waters. During this UPDES renewal Permit development, a WLA and ADR were completed as appropriate, and it was determined that this discharge will not cause a violation of water quality standards. An ADR Level I review was performed and concluded that an ADR Level II review was required due to increased discharge flow. The WLA indicates that the effluent limitations will be sufficiently protective of water quality, in order to meet State water quality standards in the receiving waters. The WLA with ADR information is attached to this Fact Sheet.

Limitations on *E. coli* and pH are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. The oil and grease is based on BPJ. Limitations for DO, TRC, and WET are derived from the attached WLA for this discharge into Sand Hollow Reservoir. Limitations on BOD₅, TSS, and TDS concentration have been carried over from the previous Permit pursuant to UAC R317-8-4.2(11).

TDS limitations are based upon Utah Water Quality Standards, TDS concentration limitations from the previous Permit 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. The CRBSCF Policy entitled “NPDES Permit Program Policy for Implementation of Colorado River Salinity Standards” (Policy), with the most current version dated October 2023, requires the TDS loading limitation of one-ton per day (or 366 tons per year alternatively) as a sum from all discharge points, unless the average concentration of TDS is 500 mg/L or less. If the concentration of TDS at any Outfall is less than or equal to 500 mg/L as a thirty-day average, then no loading limit applies for that Outfall. The one-ton per day (or 366 tons per year) loading limit applies only to those Outfalls exceeding 500 mg/L as a thirty-day average. Outfalls exceeding 500 mg/L as a thirty-day average, collectively, need to meet the one-ton per day (or 366 tons per year alternative) limit. If one-ton per day (or 366 tons per year) TDS cannot be achieved, then the Permittee will be required to remove salinity/TDS in excess of one-ton per day (or 366 tons per year) by developing a treatment process, participating in a salinity off-set program, or developing some type of mechanism to remove the salinity/TDS unless a demonstration is made by the Permittee resulting an exemption to these requirements.

Reasonable Potential Analysis

Since January 1, 2016, the Utah Division of Water Quality (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 is inadequate data for use in RP and as such, monitoring for metals are included in this Permit.

The Permit limitations are:

Parameter	Table 1: Effluent Limitations ^(a)				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow, MGD	0.07	--	--	--	--
BOD ₅ , mg/L	25	35	--	--	--
TSS, mg/L	25	35	--	--	--
DO, mg/L	--	--	--	5.0	--
TRC, mg/L	--	--	--	--	0.281

E. coli, No./100mL	126	158	--	--	--
WET, Acute Biomonitoring	--	--	--	--	IC ₅₀ > 100% effluent RWC (from WLA)
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9
TDS, tons/day/year	--	--	366 Tons/year	--	1.0 Ton/day
TDS, mg/L	--	--	--	--	1,200

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements have changed since the previous Permit. The Facility is required to sample every discharge since discharges are infrequent. WET monitoring was added to this Permit. Samples are to be collected as grabs except for WET samples are to be collected as composites. If the Facility cannot collect composite WET samples there is a list of alternative sample collection techniques. The Permit requires 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 shall be submitted using NetDMR unless the Permittee has successfully petitioned for an exception. Lab sheets for biomonitoring, metals and toxic organics shall be attached to the DMRs.

Table 2: Self-Monitoring and Reporting Requirements^(a)

Parameter	Frequency	Sample Type	Units
Total Flow ^{(b)(c)}	Continuous	Recorder	MGD
BOD ₅	Every Discharge	Grab	mg/L
TSS	Every Discharge	Grab	mg/L
DO	Every Discharge	Grab	mg/L
TRC ^(d)	Every Discharge	Grab	mg/L
E. coli	Every Discharge	Grab	No./100mL
Oil & Grease ^(e)	When Sheen Observed	Grab	mg/L
pH	Every Discharge	Grab	SU
WET – Biomonitoring ^{(f)(g)}			
Ceriodaphnia - Acute	2 nd & 4 th Quarter	Composite	Pass/Fail
Fathead Minnows - Acute	1 st & 3 rd Quarter	Composite	Pass/Fail
TDS ^(h)	Every Discharge	Grab	mg/L
TDS ^(h)	Every Discharge	Grab	mg/L
Total Arsenic	Every Discharge	Grab	mg/L
Total Manganese	Every Discharge	Grab	mg/L
Total Iron	Every Discharge	Grab	mg/L

Metals			
Total Cadmium	1 X in Permit Cycle	Grab	mg/L
Total Chromium	1 X in Permit Cycle	Grab	mg/L
Total Copper	1 X in Permit Cycle	Grab	mg/L
Total Cyanide	1 X in Permit Cycle	Grab	mg/L
Total Lead	1 X in Permit Cycle	Grab	mg/L
Total Mercury	1 X in Permit Cycle	Grab	mg/L
Total Nickel	1 X in Permit Cycle	Grab	mg/L
Total Selenium	1 X in Permit Cycle	Grab	mg/L
Total Silver	1 X in Permit Cycle	Grab	mg/L
Total Zinc	1 X in Permit Cycle	Grab	mg/L

Notes Tables 1 and 2

- a. See Definitions, *Part VIII*, for definition of terms.
- b. 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.
- c. If the rate of discharge is controlled, the rate and duration of discharge shall be reported.
- d. Analytical results less than 0.06 mg/l shall 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.
- e. Oil & Grease shall be when sheen is present or visible. If no sheen is present or visible, report NA.
- f. Acute Ceriodaphnia will be tested during the 2nd and 4th quarters and acute fathead minnows will be tested during the 1st and 3rd quarters
- g. If sampling procedures outlined in I.C.4.a, specifically, the ability to collect the three required on a Monday, Wednesday, and Friday of a sampling period cannot be followed due to the frequency of discharge at the Facility, the Permittee shall conduct the sampling following the below collection procedures. The Permittee must evaluate which option is most appropriate in the order they are listed, conducting the sampling following the first collection procedure they are able to meet.
 1. Collect the three samples in three consecutive days.
 2. If enough water is available, collect the additional samples from the detention pond following a three consecutive day procedure
 3. Collect all three samples at the time of discharge on the same day.
- h. No tons per day loading limit will be applied if the concentration of TDS in the discharge is equal to or less than 500 mg/L as a thirty-day average. However, if the thirty-day average TDS concentration exceeds 500 mg/L, then the Permittee cannot discharge more than one-ton per day (or 366 tons per year alternatively) as a sum from all discharge points exceeding 500 mg/L as a thirty-day average. If the Permittee cannot achieve one-ton per day or 366 tons per year as a sum from all applicable Outfalls, the Permittee will be required to account for the excess salinity/TDS tonnage by developing a treatment process, participating in a salinity offset program, or other type of mechanism to remove or offset the excess salinity/TDS. See Colorado River Basin Salinity Control Program Offset Agreement section below for agreement details.

Permit compliance monitoring will occur at the following locations for Outfall 001. DWQ has determined the location listed below to be representative of discharge at the Outfall location.

Outfall	Compliance Monitoring Location
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001	Located at latitude 37°6'48.57" and longitude 113°23'26.48". Samples are collected directly from the solids lagoon before discharge.
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BIOSOLIDS

The State of Utah has adopted the 40 C.F.R. § 503 federal regulations for the disposal of sewage sludge (biosolids) by reference. However, since this facility is a drinking water facility, it does not generate, receive, treat or dispose of biosolids. Therefore 40 C.F.R. § 503 shall not apply.

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 may be required based on the Standard Industrial Classification (SIC) code for the facility and the types of industrial activities occurring. If the facility is not already covered, it has 30 days from when this Permit is issued to submit the appropriate Notice of Intent (NOI) for the MSGP or exclusion documentation.

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

The Facility is a drinking water treatment facility that discharges into the Sand Hollow Reservoir. However, if any process wastewater is discharged to a Publicly Owned Treatment Works (POTW) either as indirect discharge or as a hauled waste, the waste is subject to federal, state and local pretreatment regulations. Pursuant to Section 307 of the Clean Water Act, the Permittee shall comply with all applicable Federal General Pretreatment Regulations promulgated, found in 40 CFR section 403, the State Pretreatment Requirements found in UAC R317-8-8, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the waste.

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

BIOMONITORING REQUIREMENTS

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

The Permittee is a minor industrial facility that will be discharging an infrequent amount of effluent. Since there is no historical WET data, WET testing will be required in this Permit cycle. The Facility will be required to conduct Chronic Wet tests quarterly alternating between *Ceriodaphnia dubia* and *Pimephales promelas* (fathead minnows) test species. If no toxicity is observed for 10 consecutive tests, testing frequency may be reduced or removed if approved by the Director in accordance with administrative procedures for modifying the Permit. Decisions on type of WET testing and species were based on the revised UPDES Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control dated February 2018. The Permit will also contain the standard requirements for accelerated testing upon failure of a WET test and PTI (Preliminary Toxicity Investigation) and TRE (Toxicity Reduction Evaluation) as necessary.

Alternative Wet Monitoring Procedures

Sand Hollow Groundwater Treatment Plant is anticipated to discharge only during periods of low evaporation and high water production. The intermittent nature and unknown quantity of the discharge may prevent the Facility from meeting sampling procedures outlined in I.C.4.a. of the Permit. The below language was included in the Permit to allow the Facility to have additional options to meet their WET testing requirements:

If sampling procedures outlined in I.C.4.a, specifically, the ability to collect the three (3) required samples on a Monday, Wednesday, and Friday of a sampling period cannot be followed due to the frequency of discharge at the facility, the facility shall conduct the sampling following the below collection procedures. The facility must evaluate which option is most appropriate in the order they are listed, conducting the sampling following the first collection procedure they are able to meet.

- (1) Collect the three samples in three (3) consecutive days.
- (2) If enough water is available, collect the additional samples from the detention pond following a three (3) consecutive day procedure.
- (3) Collect all three samples at the time of discharge on the same day.

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
Jordan Bryant, Storm Water
Amy Dicky, TMDL/Watershed Protection
Christopher Shope, PhD., Wasteload Analysis/ADR
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE INFORMATION (to be updated after)

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 Notice of the draft Permit was published on State of Utah and/or DWQ's website for at least 30 days as required.

During the public notice and comment period provided under UAC 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 UAC R317-8-6.12.

ADDENDUM TO FACT SHEET

During finalization of the Permit certain dates, spelling edits and minor language corrections were completed. Due to the nature of these changes, they are considered minor changes and the Permit is not required to be re Public Noticed as provided in UAC R317-8-5.6(3)

Responsiveness Summary

TBD.

DWQ-2026-000903

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ATTACHMENT 1

Wasteload Analysis



State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of Environmental Quality

Tim Davis
Executive Director

DIVISION OF WATER QUALITY
Candice A. Hasenyager, P.E.
Director

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

Date: January 20, 2026

Prepared by: Christopher L. Shope, PhD
Standards and Technical Services

Facility: Sand Hollow Groundwater Treatment Plant
UPDES Permit No. – UT0026131

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

There is a single discharge point listed in the permit renewal application (Figure 1).

- Outfall 001: The Sand Hollow Groundwater Treatment Plant is a drinking water facility designed to treat arsenic and manganese in groundwater. Arsenic and other contaminants are removed through a dual media filter. The main treatment process involves pre-oxidation with chlorine, coagulation (Ferric Chloride), and pressure filtration with sand and anthracite media. Waste from the filter backwashing is pumped to solar drying beds, which primarily rely on evaporation. However, a portion of the decant (clarified) water from the drying beds is permitted to discharge to the West Dam Drains and into Sand Hollow Reservoir when evaporation rates are not high enough to dry the solids. This occurs approximately 3 days per year and the design flow rate is 0.072 MGD.

RECEIVING WATER

The receiving water for Outfall 001 is directly into *Sand Hollow Reservoir*. Per UAC R317-2-13.12.z, the designated beneficial uses for *Sand Hollow Reservoir*, *Uses*: are 1C, 2A, 3B, and 4.

- *Class 1C - Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water*
- *Class 2A -- Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.*
- *Class 3B - Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.*
- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Per UAC R317-2-8 Protection of Downstream Uses, all actions to control waste discharges under these rules shall be modified as necessary to protect downstream designated uses.

WATER QUALITY STANDARDS

Numeric criteria based on designated beneficial uses are specified in UAC R317-2-14. In addition, narrative water quality standards must not be violated per UAC R317-2-7.2:

It shall be unlawful, and a violation of these rules, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3.

No permit may be issued by the Director per UAC R317-8-2.2(7) to a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or [a] new discharger proposing to discharge into a water segment which does not meet Utah water quality standards or is not expected to meet those standards even after the application of the effluent limitations required by the UPDES rules and for which the Director has performed a wasteload allocation for the pollutants to be discharged, must demonstrate, before the close of the public comment period, that:

- (a) There are sufficient remaining wasteload allocations to allow for the discharge; and*
- (b) The existing dischargers into the segment are subject to schedules of compliance designed to bring the segment into compliance with Utah Water Quality Standards. (See UAC R317-2.)*

CRITICAL LOW 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). Because the receiving water is a reservoir, the 7Q10 was not calculated.

Ambient receiving water quality was characterized using DWQ monitoring station DWQ 5951000 SAND HOLLOW RESERVOIR 001 for the period 2015-2025. There is not an effluent DWQ monitoring station for the discharge point, therefore the effluent discharge was characterized using the facility submitted discharge monitoring report (DMR), the permit renewal application, and the submitted ChemTech Ford Laboratory analyses. The 2020 wasteload used limited data provided in the Gunlock and Sand Hollow Water Treatment Preliminary Design Report prepared by Alpha Engineering and Carollo in 2018 (Alpha Engineering & Carollo, 2018).

TOTAL MAXIMUM DAILY LOAD (TMDL)

According to the Utah's [Final 2024 Integrated Report on Water Quality](#) dated April 30, 2024 (UDWQ, 2024), the receiving water for Outfall 001 discharge "*Sand Hollow Reservoir* (AU name: *Sand Hollow Reservoir*, AU ID: *UT-L-15010008-025_00*)" was listed as "No Evidence of Impairment". The receiving waters do not have an approved TMDL for any parameters.

MIXING ZONE

Per R317-2-5, the size of the chronic mixing zone in lakes and reservoirs shall not exceed 200 feet and the size of an acute mixing zone shall not exceed 35 feet.

Per R317-2-5.1., individual mixing zones may be further limited or disallowed in consideration of the factors in the area affected by the discharge which includes the following subheadings: a) bioaccumulation in fish tissues or wildlife, b) biologically important areas such as fish spawning/nursery areas or segments with occurrences of federally listed threatened or endangered species, c) potential human exposure to pollutants resulting from drinking water or recreational activities, d) attraction of aquatic life to the effluent plume, where toxicity to the aquatic life is occurring, e) toxicity of the substance discharged, f) zone of passage for migrating fish or other species (including access to tributaries), and /or g) accumulative effects of multiple discharges and mixing zones.

Mixing zone calculations were performed using the EPA Region VIII Simplified Mixing Zone Models (Simple Round Jet & Plane Jet) for Shoreline Dischargers to Lakes and Reservoirs.

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: total dissolved solids (TDS), total suspended solids (TSS), arsenic, iron, manganese.

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 5% effluent.

WASTELOAD ALLOCATION METHODS

Effluent limits were determined for all constituents using the EPA Region VIII Simplified Mixing Zone Models (Simple Round Jet & Plane Jet) for Shoreline Dischargers to Lakes and Reservoirs, a mass balance and mixing analysis (UDWQ, 2021). 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. The EPA Region VIII Simplified Mixing Zone Models (Simple Round Jet & Plane Jet) for Shoreline Dischargers to Lakes and Reservoirs, was used to determine the ammonia effluent limits. The analysis is summarized in the Wasteload Addendum.

Models and supporting documentation are available for review upon request.

LOCATION MAP



Figure 1: Location map of outfalls, monitoring locations, and surface water channels.

ANTIDEGRADATION

The objective of the Level I Antidegradation Review (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 ADR is required for this facility. The facility has proposed to increase the effluent discharge flow. Therefore, contaminant loading is being increased under this permit renewal. The permittee is requesting no Level II ADR under the condition that this effluent discharge is temporary and limited. The permittee is required to evaluate several alternatives such as increasing evaporation basin capacity.

DOCUMENTS

WLA Document: *260120-Sand_Hollow_GW_WLA_2026_Jet_Model.docx*

Wasteload Analysis and Addendums: *260120-Sand_Hollow_GW_WLA_2026_Jet_Model.xlsm*

REFERENCES

Alpha Engineering , & Carollo. 2018. Technical Memorandum 1 Gunlock & Sand Hollow Water Treatment

Utah Division of Water Quality. 2024. Final 2024 Integrated Report on Water Quality. <https://lf-public.deq.utah.gov/WebLink/DocView.aspx?id=87957&repo=Public&searchid=fcd9ea4c-51e1-4227-aa29-fb1921c2cc19&cr=1>

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>

WASTELOAD ANALYSIS [WLA]

Addendum: Statement of Basis

SUMMARY

Discharging Facility: Sand Hollow Groundwater Treatment Plant
 UPDES No: UT0026131
 Current Flow: 0.07 MGD Design Flow
 Design Flow 0.07 MGD

Receiving Water: West Dam Drains -> Sand Hollow Reservoir
 Lake Classification: 1C,2A,3B,4

TDS (mg/l)	522.40	Average
Hardness (mg/l)	283.00	Average
pH	8.55	Average
Temp (C)	18.33	Average

Selected Effluent Limit Summary:

Flow, MGD:	0.07 MGD	Design Flow	
BOD, mg/l:	25.0 All Season	5 Indicator	
Dissolved Oxygen, mg/l:	5.00 All Season	5.50 30 Day Average	
TNH3, Chronic, mg/l:	57.33 All Season	Varies Function of pH and Temperature	
TDS, mg/l:	10557.64 All Season	1200	
Zinc, ug/l	4241.53 All Season	Varies	Function of Hardness
Copper, ug/l	484.08 All Season	Varies	Function of Hardness

WQ Standard:

Modeling Parameters:

Acute Dilution Ratio	14.81 to 1
Chronic Dilution Ratio:	84.63 to 1

Level 1 Antidegradation Level Completed: Level II Review required - Class 1C drinking water source.

Date: 1/20/2026

Wasteload Analysis - Total Maximum Daily Load (Lake TMDL)

1/21/2026 7:53

Facility: Sand Hollow Groundwater Treatment Plant
Discharging to: West Dam Drains -> Sand Hollow Reservoir

UPDES No: UT- UT0026131

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 lake water quality. The wasteload analysis does not take 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 water quality parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), unionized 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 water quality response to point source discharges. Models aid in the effort of anticipating water quality at future effluent flows at critical environmental conditions (e.g., high temperature, high pH, etc).

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

II. Receiving Water and Lake / Reservoir Classification

West Dam Drains -> Sand H 1C,2A,3B,4

III. Numeric Water Quality Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Function of Temperature and pH	pH	Temp
	0.79 mg/l as N (4 Day Average)	8.29	25.0
	4.66 mg/l as N (1 Hour Average)	8.31	24.6
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average)		
	0.019 mg/l (1 Hour Average)		
Chronic Dissolved Oxygen (DO)	5.50 mg/l (30 Day Average)		
	4.00 mg/l (7Day Average)	5.00	
	3.00 mg/l (1 Day Average)	4.00	
Maximum Total Dissolved Solids [Class 4 Ag]	1200 mg/l		
Maximum Boron [Class 4 Ag]	750 mg/l		

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration	1 Hour Average (Acute) Standard Concentration
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Aluminum	87.000 ug/l	750	ug/l
Antimony	ug/l		ug/l
Arsenic	190.000 ug/l	360.00	ug/l
Asbestos	ug/l		ug/l
Barium	ug/l	1000.00	ug/l
Beryllium	ug/l		ug/l
Cadmium	0.618 ug/l	6.60	ug/l
Chromium III	214.792 ug/l	4493.87	ug/l
Chromium VI	11.000 ug/l	16.00	ug/l
Copper	24.190 ug/l	40.03	ug/l
Cyanide	ug/l		ug/l
Iron	ug/l	1000.00	ug/l
Lead	13.156 ug/l	337.60	ug/l
Mercury	0.012 ug/l	2.40	ug/l
Nickel	226.63 ug/l	1205.10	ug/l
Selenium	5.000 ug/l	20.00	ug/l
Silver	ug/l	25.76	ug/l
Thallium			
Zinc	308.201 ug/l	308.20	ug/l

Based upon a Hardness of 304.98 mg/l as CaCO3

Based upon 303.74 mg/l as CaCO3

Organics [Pesticides]

4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
Parameter	Concentration	Concentration	
Aldrin		1.500	ug/l
Chlordane	0.0043 ug/l	1.200	ug/l
DDT, DDE	0.001 ug/l	0.550	ug/l
Dieldrin	0.0056 ug/l	0.240	ug/l
Endosulfan, a & b	0.056 ug/l	0.110	ug/l
Endrin	0.036 ug/l	0.086	ug/l
Guthion			
Heptachlor & H. epoxide	0.0038 ug/l	0.260	ug/l
Lindane	0.08 ug/l	1.000	ug/l
Methoxychlor		0.030	ug/l
Mirex		0.001	ug/l
Parathion	0.0130 ug/l	0.066	ug/l
PCB's	0.014 ug/l		
Pentachlorophenol	15.00 ug/l	19.000	ug/l
Toxephene	0.0002 ug/l	0.730	ug/l

IV. Numeric Water Quality Standards for Protection of Agriculture

	1 Hour Average (Acute) Standard
	Concentration
TDS	1200 mg/l
Arsenic	100 ug/l
Boron	750 ug/l
Cadmium	10 ug/l
Chromium	100 ug/l
Copper	200 ug/l
Lead	100 ug/l
Selenium	50 ug/l

TDS

1200

mg/l

V. Numeric Water Quality Standards for Protection of Human Health (Class 1C Waters)**1 Hour Average (Acute) Standard
Concentration**

Metals		
Arsenic	10	ug/l
Barium	1000	ug/l
Cadmium	10	ug/l
Chromium	50	ug/l
Lead	50	ug/l
Mercury	2	ug/l
Selenium	50	ug/l
Silver	50	ug/l
Fluoride (3)	1.4	ug/l
to	2.4	ug/l
Nitrates as N	10	ug/l
Chlorophenoxy Herbicides		
2,4-D	100	ug/l
2,4,5-TP	10	ug/l
Methoxychlor	100	ug/l

VI. Numeric Water Quality Standards the Protection of Human Health from Water & Fish Consumption [Toxics]**Maximum Conc., ug/l - Acute Standards****Class 1C**

[2 Liters/Day for 70 Kg Person over 70 Yr.

Class 3A, 3B, 3C, 3D

[6.5 g for 70 Kg Person]

Antimony	5.6 ug/l	640 ug/l
Arsenic	A	A
Beryllium	C	C
Cadmium	C	C
Chromium III	C	C
Chromium VI	C	C
Copper	1,300 ug/l	
Lead	C	C
Mercury	A	A
Nickel	100 ug/l	4,600 ug/l
Selenium	A	4,200 ug/l
Silver		
Thallium	0.24 ug/l	6.3 ug/l
Zinc	7400 ug/l	26,000 ug/l
Cyanide	140 ug/l	220,000 ug/l
Asbestos	7.00E+06 Fibers/L	
2,3,7,8-TCDD Dioxin	5.0 E-9 ug/l	5.1 E-9 ug/l
Acrolein	190 ug/l	290 ug/l
Acrylonitrile	0.051 ug/l	0.25 ug/l
Alachlor	2 ug/l	
Benzene	2.2 ug/l	51 B ug/l
Bromoform	4.3 ug/l	140.00 ug/l
Carbofuran	40	
Carbon Tetrachloride	0.23 ug/l	1.60 ug/l

Utah Division of Water Quality

Chlorobenzene	100 ug/l	21,000 ug/l
Chlorodibromomethane	0.4 ug/l	13.00 ug/l
Chloroethane		
2-Chloroethylvinyl Ether		
Chloroform	5.7 ug/l	470.00 ug/l
Dalapon	200 ug/l	
Di(2ethylhexl)adipate	400 ug/l	
Dichlorobromopropane	0.2	
Dichlorobromomethane	0.55 ug/l	17.00 ug/l
1,1-Dichloroethane		
1,2-Dichloroethane	0.38 ug/l	37.00 ug/l
1,1-Dichloroethylene	7 ug/l	3.20 ug/l
Dichloroethylene (cis-1,2)	70	
Dinoseb	7	
Diquat	20	
1,2-Dichloropropane	0.5 ug/l	15.00 ug/l
1,3-Dichloropropene	0.34 ug/l	1,700 ug/l
Endothall	100	
Ethylbenzene	530 ug/l	29,000 ug/l
Ethyldibromide	0.05 ug/l	
Glyphosate	700 ug/l	
Haloacetic acids	60 ug/l E	
Methyl Bromide	47 ug/l	1,500 ug/l
Methyl Chloride	F	F
Methylene Chloride	4.6 ug/l	590.00 ug/l
Ocamyl (vidate)	200 ug/l	
Picloram	500 ug/l	
Simazine	4 ug/l	
Styrene	100 ug/l	
1,1,2,2-Tetrachloroethane	0.17 ug/l	4.00 ug/l
Tetrachloroethylene	0.69 ug/l	3.30 ug/l
Toluene	1000 ug/l	200,000 ug/l
1,2 -Trans-Dichloroethylene	100 ug/l	140,000 ug/l
1,1,1-Trichloroethane	200 ug/l	F
1,1,2-Trichloroethane	0.59 ug/l	16.00 ug/l
Trichloroethylene	2.5 ug/l	30.00 ug/l
Vinyl Chloride	0.025 ug/l	530.00 ug/l
Xylenes	10000 ug/l	
2-Chlorophenol	81 ug/l	150 ug/l
2,4-Dichlorophenol	77 ug/l	290 ug/l
2,4-Dimethylphenol	380 ug/l	850 ug/l
2-Methyl-4,6-Dinitrophenol	13 ug/l	280 ug/l
2,4-Dinitrophenol	69 ug/l	5,300 ug/l
2-Nitrophenol		
4-Nitrophenol		
3-Methyl-4-Chlorophenol		
Penetachlorophenol	0.27 ug/l	3.00 ug/l
Phenol	21000 ug/l	1,700,000 ug/l
2,4,6-Trichlorophenol	1.4 ug/l	2.40 ug/l
Acenaphthene	670 ug/l	990 ug/l
Acenaphthylene	ug/l	ug/l
Anthracene	8300 ug/l	40,000 ug/l

Utah Division of Water Quality

Benzidine	0.000086 ug/l	B	0.00 ug/l
BenzoaAnthracene	0.0038 ug/l		0.02 ug/l
BenzoaPyrene	0.0038 ug/l		0.02 ug/l
BenzobFluoranthene	0.0038 ug/l		0.02 ug/l
BenzoghiPerylene	ug/l		
BenzokFluoranthene	0.0038 ug/l		0.02 ug/l
Bis2-ChloroethoxyMethane	ug/l		
Bis2-ChloroethylEther	0.03 ug/l		0.53 ug/l
Bis2-Chloroisopropyl Ether	1400 ug/l		65,000 ug/l
Bis2-EthylbexylPhthalate	1.2 ug/l		2.20 ug/l
4-Bromophenyl Phenyl Ether	ug/l		
Butylbenzyl Phthalate	1500 ug/l		1,900 ug/l
2-Chloronaphthalene	1000 ug/l		1,600 ug/l
4-Chlorophenyl Phenyl Ether	ug/l		
Chrysene	0.0038 ug/l		0.02 ug/l
Dibenzoa, hAnthracene	0.0038 ug/l		0.02 ug/l
1,2-Dichlorobenzene	420 ug/l		17,000 ug/l
1,3-Dichlorobenzene	320 ug/l		960 ug/l
1,4-Dichlorobenzene	63 ug/l		2,600 ug/l
3,3-Dichlorobenzidine	0.021 ug/l		0.03 ug/l
Diethyl Phthalate	17000 ug/l		44,000 ug/l
Dimethyl Phthalate	270000 ug/l		1,100,000 ug/l
Di-n-Butyl Phthalate	2000 ug/l		4,500 ug/l
2,4-Dinitrotoluene	0.11 ug/l		3.40 ug/l
2,6-Dinitrotoluene	ug/l		
Di-n-Octyl Phthalate	ug/l		
1,2-Diphenylhydrazine	0.036 ug/l		0.20 ug/l
Fluoranthene	130 ug/l		140.00 ug/l
Fluorene	1100 ug/l		5,300 ug/l
Hexachlorobenzene	0.00028 ug/l		0.00029 B ug/l
Hexachlorobutidine	0.44 ug/l		18.00 ug/l
Hexachloroethane	1.4 ug/l		3.30 ug/l
Hexachlorocyclopentadiene	40 ug/l		17,000 ug/l
Ideno 1,2,3-cdPyrene	0.0038 ug/l		0.02 ug/l
Isophorone	35 ug/l	B	960.00 ug/l
Naphthalene			
Nitrobenzene	17 ug/l		690 ug/l
N-Nitrosodimethylamine	0.00069 ug/l		3.00 ug/l
N-Nitrosodi-n-Propylamine	0.005 ug/l		0.51 ug/l
N-Nitrosodiphenylamine	3.3 ug/l		6.00 ug/l
Phenanthrene			
Pyrene	830 ug/l		4,000 ug/l
1,2,4-Trichlorobenzene	260 ug/l		940 ug/l
Aldrin	0.000049 ug/l		0.000050 ug/l
alpha-BHC	0.0026 ug/l		0.00 ug/l
beta-BHC	0.0091 ug/l		0.02 ug/l
gamma-BHC (Lindane)	0.2 ug/l		0.06 ug/l
delta-BHC			
Chlordane	0.0008 ug/l		0.00 ug/l
4,4-DDT	0.00022 ug/l		0.00 ug/l
4,4-DDE	0.00022 ug/l		0.00 ug/l
4,4-DDD	0.00031 ug/l		0.00 ug/l

Utah Division of Water Quality

Dieldrin	0.000052 ug/l	B	0.000054 ug/l
alpha-Endosulfan	62 ug/l		89 ug/l
beta-Endosulfan	62 ug/l		89 ug/l
Endosulfan Sulfate	62 ug/l		89 ug/l
Endrin	0.059 ug/l		0.81 ug/l
Endrin Aldehyde	0.29 ug/l		0.30 ug/l
Heptachlor	0.000079 ug/l	B	0.000079 ug/l
Heptachlor Epoxide	0.000039 ug/l	B	0.000039 ug/l
Polychlorinated Biphenyls	0.000064 ug/l	B,D	0.000064 ug/l
Toxaphene	0.00028 ug/l		0.00028 ug/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 Water Quality 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) 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.

The Utah Reservoir and Lake Model is a simple round jet model which was received from EPA Region 8. It assumes a discharge expands into the receiving water as a 1/2 cone from the point of discharge with the appropriate dilution.

The dilution ratios for this wasteload analysis are as follows:

Acute Dilution Ratio: 14.8 to 1
Chronic Dilution Ratio: 84.6 to 1

VIII. Modeling Information

The required information for the model may include the following information for both the lake and effluent conditions:

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
D.O. mg/l	

Other Conditions

In addition to the lake 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

Lake Information	Temp.	pH	T-NH3	BOD	DO	TRC	TDS
	Deg. C		mg/l as N	mg/l	mg/l	mg/l	mg/l
	25.1	8.3	0.00	N/A	N/A	0.00	522.4

Discharge Information	Season	Flow, MGD	Temp.
	All Seasons	0.1	18.3

IX. Effluent Limitations based upon Water Quality Standards

Effluent Limitation for Flow

All Seasons		
Not to Exceed:	0.07 MGD	Daily Average
	0.11 cfs	Daily Average
WET Requirements	As determined by Permits & Compliance Branch	

Effluent Limitation for Biological Oxygen Demand (BOD)

	Concentration
30 Day Average	25.0 mg/l as BOD5
30 Day Average	20.0 mg/l as CBOD5

Effluent Limitation for Dissolved Oxygen (DO)

	Concentration 1 Day Average (Acute)	
30 Day Average	5.00 mg/l	4.00

Effluent Limitation for Total Ammonia

	4 Day Average [Chronic] Concentration	Load
All Seasons	57.33 mg/l as N	34.4 lbs/day
	1 Hour Average [Acute] Concentration	Load
	25.0 mg/l as N	15.0 lbs/day

Effluent Limitation for Total Residual Chlorine

	4 Day Average [Chronic] Concentration	Load
All Seasons	0.931 mg/l	0.6 lbs/day
	1 Hour Average [Acute] Concentration	Load
	0.281 mg/l	0.2 lbs/day

Effluent Limitations for Metals

	4 Day Average (Chronic)		1 Hour Average (Acute)	
	Concentration	Load	Concentration	Load
Aluminum	6108.25 ug/l*	3.7 lbs/day	10900.33 ug/l	6.5
Arsenic	12526.17 ug/l	7.5 lbs/day	5007.63 ug/l*	3.0
Barium			14809.98 ug/l	8.9
Cadmium	3.30 ug/l*	0.0 lbs/day	80.82 ug/l	0.0
Chromium III	15423.65 ug/l*	9.3 lbs/day	20926.67 ug/l	12.6
Chromium VI	930.91 ug/l	0.6 lbs/day	236.96 ug/l*	0.1
Copper	1463.51 ug/l	0.9 lbs/day	484.08 ug/l*	0.3
Iron			14602.83 ug/l	8.8
Lead	574.99 ug/l*	0.3 lbs/day	3108.51 ug/l	1.9
Mercury	0.76 ug/l*	0.000 lbs/day	35.50 ug/l	0.0

Utah Division of Water Quality

Nickel	11053.96 ug/l*	6.6 lbs/day	17709.19 ug/l	10.6
Selenium	347.48 ug/l	0.2 lbs/day	265.60 ug/l*	0.2
Silver			308.20 ug/l	0.2
Zinc	138655.78 ug/l	83.2 lbs/day	4241.53 ug/l*	2.5

* Most stringent between Chronic & Acute Effluent Limitations

Effluent Limitations for Organics [Pesticides]

Pesticide	4 Day Average		1 Hour Average	
	Concentration	Load	Concentration	Load
Aldrin			22.2150 ug/l	0.013
Chlordane	0.3639 ug/l*	0.000 lbs/day	17.7720 ug/l	0.011
DDT, DDE	0.0846 ug/l*	0.000 lbs/day	8.1455 ug/l	0.005
Dieldrin	0.4739 ug/l*	0.000 lbs/day	3.5544 ug/l	0.002
Endosulfan	4.7392 ug/l	0.003 lbs/day	1.6291 ug/l*	0.001
Endrin	3.0466 ug/l	0.002 lbs/day	1.2737 ug/l*	0.001
Guthion			0.0000 ug/l	0.000
Heptachlor	0.3216 ug/l*	0.000 lbs/day	3.8506 ug/l	0.002
Lindane	6.7703 ug/l*	0.004 lbs/day	14.8100 ug/l	0.009
Methoxychlor			0.4443 ug/l	0.000
Mirex			0.0148 ug/l	0.000
Parathion			0.9775 ug/l	0.001
PCB's	1.1848 ug/l	0.001 lbs/day	0.0000 ug/l*	0.000
Pentachlorophenol	1269.4266 ug/l	0.762 lbs/day	281.3896 ug/l*	0.169
Toxephene	0.0169 ug/l*	0.000 lbs/day	10.8113 ug/l	0.006

Effluent Limitations for Protection of Human Health (Class 1C Waters)

Metals	1 Hour Average (Acute) Standard	
	Concentration	Load
Arsenic	148.10 ug/l	0.09
Barium	14809.98 ug/l	8.89
Cadmium	148.10 ug/l	0.09
Chromium	740.50 ug/l	0.44
Lead	740.50 ug/l	0.44
Mercury	29.62 ug/l	0.02
Selenium	740.50 ug/l	0.44
Silver	740.50 ug/l	0.44
Fluoride	20.73 ug/l	0.01
to	35.54 ug/l	0.02
Nitrates as N	148.10 ug/l	0.09
Pesticides		
2,4-D	1481.00 ug/l	0.89
2,4,5-TP	148.10 ug/l	0.09
Methoxychlor	1481.00 ug/l	0.89

Effluent Limitations for Protection of Human Health [Toxics Rule]

Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)

Toxics Rule Parameters	Maximum Conc., ug/l - Acute Standards			
	Class 1C		Class 3A, 3B	
	[2 Liters/Day for 70 Kg Person over 70 Yr.		[6.5 g for 70 Kg Person over 70 Yr. Pe	
Antimony	82.94 ug/l	0.05 lbs/day	82.94 ug/l	0.0
Arsenic				
Beryllium				
Cadmium				
Chromium III				
Chromium VI				
Copper	19252.97 ug/l	11.56 lbs/day	19252.97 ug/l	11.6
Lead				
Mercury		lbs/day	1481.00 ug/l	0.9
Nickel	1481.00 ug/l	0.89 lbs/day		
Selenium			109593.83 ug/l	65.8
Silver			2073.40 ug/l	1.2
Thallium	3.55 ug/l	0.00 lbs/day		
Zinc	109593.83 ug/l	65.80 lbs/day	2813.90 ug/l	1.7
Cyanide	2073.40 ug/l	1.24 lbs/day	0.76 ug/l	0.0
Asbestos	103669835.98 ug/l	6.22E+04 lbs/day	63.68 ug/l	0.0
0	0.00 ug/l	0.00 lbs/day		
2,3,7,8-TCDD Dioxin	0.00 ug/l	0.00 lbs/day	1481.00 ug/l	0.9
Acrolein	2813.90 ug/l	1.69 lbs/day	5.92 ug/l	0.0
Acrylonitrile	0.76 ug/l	0.00 lbs/day		
Benzene	32.58 ug/l	0.02 lbs/day		
Bromoform	63.68 ug/l	0.04 lbs/day	84.42 ug/l	0.1
Carbon Tetrachloride	0.00 ug/l	0.00 lbs/day		
Chlorobenzene	1481.00 ug/l	0.89 lbs/day		
Chlorodibromomethane	5.92 ug/l	0.00 lbs/day	5.63 ug/l	0.0
Chloroethane	0.00 ug/l	0.00 lbs/day	103.67 ug/l	0.1
2-Chloroethylvinyl Ether	0.00 ug/l	0.00 lbs/day	7.40 ug/l	0.0
Chloroform	84.42 ug/l	0.05 lbs/day	5.04 ug/l	0.0
Dichlorobromomethane	8.15 ug/l	0.00 lbs/day	696.07 ug/l	0.4
1,1-Dichloroethane	0.00 ug/l	0.00 lbs/day		
1,2-Dichloroethane	5.63 ug/l	0.00 lbs/day	68.13 ug/l	0.0
1,1-Dichloroethylene	103.67 ug/l	0.06 lbs/day	2.52 ug/l	0.0
1,2-Dichloropropane	7.40 ug/l	0.00 lbs/day	14809.98 ug/l	8.9
1,3-Dichloropropene	5.04 ug/l	0.00 lbs/day	8.74 ug/l	0.0
Ethylbenzene	7849.29 ug/l	4.71 lbs/day	37.02 ug/l	0.0
Methyl Bromide	696.07 ug/l	0.42 lbs/day	0.37 ug/l	0.0
Methyl Chloride	0.00 ug/l	0.00 lbs/day	1199.61 ug/l	0.7
Methylene Chloride	68.13 ug/l	0.04 lbs/day	1140.37 ug/l	0.7
1,1,2,2-Tetrachloroethane	2.52 ug/l	0.00 lbs/day	5627.79 ug/l	3.4
Tetrachloroethylene	10.22 ug/l	0.01 lbs/day	192.53 ug/l	0.1
Toluene	14809.98 ug/l	8.89 lbs/day		
1,2 -Trans-Dichloroethylene	1481.00 ug/l	0.89 lbs/day		
1,1,1-Trichloroethane	0.00 ug/l	0.00 lbs/day	4.00 ug/l	0.0
1,1,2-Trichloroethane	8.74 ug/l	0.01 lbs/day	311009.51 ug/l	186.7
Trichloroethylene	37.02 ug/l	0.02 lbs/day	20.73 ug/l	0.0
Vinyl Chloride	0.37 ug/l	0.00 lbs/day	9922.68 ug/l	6.0

Utah Division of Water Quality

2-Chlorophenol	1199.61 ug/l	0.72 lbs/day		
2,4-Dichlorophenol	1140.37 ug/l	0.68 lbs/day	122922.81 ug/l	73.8
2,4-Dimethylphenol	5627.79 ug/l	3.38 lbs/day		
2-Methyl-4,6-Dinitrophenol	192.53 ug/l	0.12 lbs/day	0.06 ug/l	0.0
2,4-Dinitrophenol	1021.89 ug/l	0.61 lbs/day	0.06 ug/l	0.0
2-Nitrophenol	0.00 ug/l	0.00 lbs/day	0.06 ug/l	0.0
4-Nitrophenol	0.0000 ug/l	0.0000 lbs/day		
3-Methyl-4-Chlorophenol	0.0000 ug/l	0.0000 lbs/day	0.06 ug/l	0.000
Penetachlorophenol	3.9987 ug/l	0.0024 lbs/day		
Phenol	311009.5079 ug/l	1.87E+02 lbs/day	0.44 ug/l	0.000
2,4,6-Trichlorophenol	20.7340 ug/l	0.0124 lbs/day	20733.97 ug/l	12.448
Acenaphthene	9922.68 ug/l	5.96 lbs/day		
Acenaphthylene	0.00 ug/l	0.00 lbs/day	22214.96 ug/l	13.3
Anthracene	122922.81 ug/l	73.80 lbs/day	14809.98 ug/l	8.9
Benzidine	0.00 ug/l	0.00 lbs/day		
BenzoaAnthracene	0.06 ug/l	0.00 lbs/day	0.06 ug/l	0.0
BenzoaPyrene	0.06 ug/l	0.00 lbs/day	0.1 ug/l	0.0
BenzobFluoranthene	0.06 ug/l	0.00 lbs/day	6220.19 ug/l	3.7
BenzoghiPerylene	0.00 ug/l	0.00 lbs/day	4739.19 ug/l	2.8
BenzokFluoranthene				
Bis2-ChloroethoxyMethane				
Bis2-ChloroethylEther	0.4443 ug/l	0.00027 lbs/day	2.52E+05 ug/l	1.51E+02
Bis2-Chloroisopropyl Ether	20733.9672 ug/l	1.24E+01 lbs/day	4.00E+06 ug/l	2.40E+03
Bis2-EthylhexylPhthalate	17.7720 ug/l	0.01067 lbs/day	29619.95314 ug/l	17.78263
4-Bromophenyl Phenyl Ether	0.0000 ug/l	0.00000 lbs/day	1.62910 ug/l	0.00098
Butylbenzyl Phthalate	22214.9649 ug/l	1.33E+01 lbs/day		
2-Chloronaphthalene	14809.9766 ug/l	8.89131 lbs/day		
4-Chlorophenyl Phenyl Ether	0.0000 ug/l	0.00000 lbs/day	0.53316 ug/l	0.00032
Chrysene	0.0563 ug/l	0.00003 lbs/day	1925.29695 ug/l	1.15587
Dibenzoa, hAnthracene	0.0563 ug/l	0.00003 lbs/day	16290.97422 ug/l	9.78045
1,2-Dichlorobenzene	6220.1902 ug/l	3.73435 lbs/day	0.00415 ug/l	0.00000
1,3-Dichlorobenzene	4739.1925 ug/l	2.84522 lbs/day	6.51639 ug/l	0.00391
1,4-Dichlorobenzene	933.0285 ug/l	0.56015 lbs/day	20.73397 ug/l	0.01245
3,3-Dichlorobenzidine				
Diethyl Phthalate				
Dimethyl Phthalate				
Di-n-Butyl Phthalate	29619.95314 ug/l	17.78263 lbs/day		
2,4-Dinitrotoluene	1.62910 ug/l	0.00098 lbs/day	251.769602 ug/l	0.151152
2,6-Dinitrotoluene	0.00000 ug/l	0.00000 lbs/day	0.010219 ug/l	0.000006
Di-n-Octyl Phthalate	0.00000 ug/l	0.00000 lbs/day	0.074050 ug/l	0.000044
1,2-Diphenylhydrazine	0.53316 ug/l	0.00032 lbs/day	48.872923 ug/l	0.029341
Fluoranthene	1925.29695 ug/l	1.15587 lbs/day		
Fluorene	16290.97422 ug/l	9.78045 lbs/day	1.23E+04 ug/l	7.38E+00
Hexachlorobenzene				
Hexachlorobutidine				
Hexachloroethane	20.73 ug/l	0.01 lbs/day		
Hexachlorocyclopentadiene				
Ideno 1,2,3-cdPyrene				
Isophorone	518.35 ug/l	0.31 lbs/day		
Naphthalene				
Nitrobenzene				
N-Nitrosodimethylamine	0.01 ug/l	0.00 lbs/day		

Utah Division of Water Quality

N-Nitrosodi-n-Propylamine	0.07 ug/l	0.00 lbs/day	0.00 ug/l	0.0
N-Nitrosodiphenylamine	4.89E+01 ug/l	2.93E-02 lbs/day		
Phenanthrene	0.00 ug/l	0.00 lbs/day	918.22 ug/l	0.6
Pyrene	12292.28 ug/l	7.38 lbs/day		
1,2,4-Trichlorobenzene			918.22 ug/l	0.6
Aldrin			0.87 ug/l	0.0
alpha-BHC	0.03850594 ug/l	0.000023 lbs/day		
beta-BHC	0.13477079 ug/l	0.000081 lbs/day		
gamma-BHC (Lindane)	2.96199531 ug/l	0.001778 lbs/day		
delta-BHC		0.000000 lbs/day		
Chlordane	0.01184798 ug/l	0.000007 lbs/day		
4,4-DDT	0.00325819 ug/l	0.000002 lbs/day		
4,4-DDE	0.00325819 ug/l	0.000002 lbs/day		
4,4-DDD	0.00459109 ug/l	0.000003 lbs/day		
Dieldrin		0.000000 lbs/day		
alpha-Endosulfan	918.22 ug/l	0.551 lbs/day		
beta-Endosulfan	918.22 ug/l	0.551 lbs/day		
Endosulfan Sulfate	918.22 ug/l	0.551 lbs/day		
Endrin	0.87378862 ug/l	0.001 lbs/day		
Endrin Aldehyde	4.29489320 ug/l	0.003 lbs/day		
Heptachlor		lbs/day		
Heptachlor Epoxide		lbs/day		
Polychlorinated Biphenyls		lbs/day		
0	0.00000000 ug/l	0.000000 lbs/day		
Toxaphene	0.00414679 ug/l	0.000002 lbs/day		
Specific Parameter: TDS	0 ug/l	0.000000 lbs/day	10557.64 mg/l	6.3

Effluent Limitations for the Protection of Agriculture

	1 Hour Average (Acute) Standard	
	Concentration	Load
Arsenic	1481.00 ug/l	0.89
Boron	11107.48 ug/l	6.67
Cadmium	148.10 ug/l	0.09
Chromium	1481.00 ug/l	0.89
Copper	2962.00 ug/l	1.78
Lead	1481.00 ug/l	0.89
Selenium	740.50 ug/l	0.44

**Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rules**

Utah Division of Water Quality

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		10900.33				10900.33	6108.25
Antimony			82.94			82.94	
Arsenic	1481.00	5007.63			148.10	148.10	12526.17
Asbestos							
Barium		14809.98			14809.98	14809.98	
Cadmium	148.10	80.82			148.10	80.82	3.30
Chromium (III)		20926.7			740.50	740.50	15423.65
Chromium (VI)	1481.00	236.96				236.96	930.91
Copper	2962.00	484.08				484.08	1463.51
Cyanide				2073.40		2073.40	
Iron		14602.83				14602.83	
Lead	1481.00	3108.51			740.50	740.50	574.99
Mercury		35.5025			29.62	29.62	0.7647
Nickel		17709.19		1481.00		1481.00	11053.96
Selenium	740.50	265.60			740.50	265.60	347.48
Silver		308.20			740.50	308.20	
Thallium				3.55		3.55	
Zinc		4241.53				4241.53	138655.78

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]

	ug/l	Acute lbs/day	Chronic ug/l	lbs/day
Aluminum	10900.33	6.5	6108.25	3.7
Antimony	82.94	0.0		
Arsenic	148.10	0.1	12526.17	7.5
Asbestos				
Cadmium	80.82	0.0	3.30	0.0
Chromium (III)	740.50	0.4	15423.65	9.3
Chromium (VI)	236.96	0.1	930.91	0.6
Copper	484.08	0.3	1463.51	0.9
Cyanide	2073.40	1.2		
Iron	14602.83	8.8		
Lead	740.50	0.4	574.99	0.3
Mercury	29.62	0.0	0.76	0.0
Nickel	1481.00	0.9	11053.96	6.6
Selenium	265.60	0.2	347.48	0.2
Silver	308.20	0.2		
Zinc	4241.53	2.5	138655.78	83.2

Effluent Indicators / Targets for Pollution Indicators

Water quality targets for pollution Indicators will be met with an effluent limit as follows:

	Indicator / Target mg/l	Target mg/l	lbs/day
Gross Beta (pCi/l)	50.0 pCi/L		
BOD	5.0	74.05	33777.65
Nitrates as N	4.0	59.24	27022.12
Total Phosphorus as P	0.05	0.74	337.78
Total Suspended Solids	90.0	1332.90	607997.75

Other Effluent Limitations are based upon R317-1.

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing water users.

Category III waters fall under special rules for the determination of effluent limits. These rules allow more stringent effluent limitations based upon additional factors, including: "blue-ribbon" fisheries, special recreation areas, and drinking water sources.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless shown that this is not attainable. Refer to the Forum's Guidelines for additional information.

The permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations.

XII. Summary Comments

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

The permit writers may utilize other information to adjust these limits or to determine other limits based upon best available technology and other considerations. Under no circumstances however, may those alterations allow for the violation of water quality standards by the permittee.

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information.

XIV. Notice of Availability of Information

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

Prepared by:
Christopher L Shope, PhD
Utah Division of Water Quality
801-536-4309

251209-Sand_Hollow_GW_WLA_2025_Jet_Model.xlsm

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ATTACHMENT 2

Antidegradation Review Level II

LEVEL II ANTIDEGRADATION REVIEW FORM

UTAH DIVISION OF WATER QUALITY

Instructions

The objective of antidegradation rules and policies is to protect existing high quality waters and set forth a process for determining where and how much degradation is allowable for socially and/or economically important reasons. In accordance with Utah Administrative Code (UAC R317-2-3), an antidegradation review (ADR) is a permit requirement for any project that will increase the level of pollutants in waters of the state. The rule outlines requirements for Level I and Level II ADRs, as well as public comment procedures. This review form is intended to assist the applicant and Division of Water Quality (DWQ) staff in complying with the rule but is not a substitute for the complete rule in R317-2-3.5. Additional details can be found in the *Utah Antidegradation Implementation Guidance* and relevant sections of the guidance are cited in this review form.

ADRs should be among the first steps of an application for a UPDES permit because the review helps establish treatment expectations. The level of effort and amount of information required for the ADR depends on the nature of the project and the characteristics of the receiving water. To avoid unnecessary delays in permit issuance, the Division of Water Quality (DWQ) recommends that the process be initiated at least one year prior to the date a final approved permit is required.

DWQ will determine if the project will impair beneficial uses (Level I ADR) using information provided by the applicant and whether a Level II ADR is required. The applicant is responsible for conducting the Level II ADR. For the permit to be approved, the Level II ADR must document that all feasible measures have been undertaken to minimize pollution for socially, environmentally or economically beneficial projects resulting in an increase in pollution to waters of the state.

For permits requiring a Level II ADR, this antidegradation form must be completed and approved by DWQ before any UPDES permit can be issued. Typically, the ADR form is completed in an iterative manner in consultation with DWQ. The applicant should first complete the statement of social, environmental and economic importance (SEEI) in Part C and determine the parameters of concern (POC) in Part D. Once the POCs are agreed upon by DWQ, the alternatives analysis and selection of preferred alternative in Part E can be conducted based on minimizing degradation resulting from discharge of the POCs. Once the applicant and DWQ agree upon the preferred alternative, the review is considered complete, and the form must be signed, dated, and submitted to DWQ.

**Utah Division of Water Quality
Level II Antidegradation Review Form**

Part A: Application Information

Facility Name: Sand Hollow Groundwater Treatment Plant

Facility Owner: Washington County Water Conservancy District

Facility Location: 3351 Sandy Hollow Rd, Hurricane, Utah 84737

Form Prepared By: Jordan Jones

Outfall Number: 001

Receiving Water: Sand Hollow Reservoir

Designated Beneficial Uses of the Receiving Water (R317-2-13):

Domestic Water Supply: ☒ 1C

Recreation: ☒ 2A ☐ 2B

Aquatic Life: ☐ 3A ☒ 3B ☐ 3C ☐ 3D ☐ 3E

Agricultural Water Supply: ☒ 4

Great Salt Lake: ☐ 5A ☐ 5B ☐ 5C ☐ 5D ☐ 5E

Antidegradation Category of Receiving Water (R317-2-12):

☐ 1 ☐ 2 ☒ 3

UPDES Permit Number: UT0026131

Effluent Flow Reviewed:

Typically, this is the maximum monthly average discharge at design capacity. Exceptions should be noted.

Max Discharge Flow = 72,000 gpd*

*Single annual event. 72,000 gpd for three days per year.

What is the application for? (check all that apply)

- ☐ A UPDES permit for a new facility, project, or outfall.
- ☐ A UPDES permit renewal with an expansion or modification of an existing wastewater treatment works.
- ☒ A UPDES permit renewal requiring limits for a pollutant not covered by the previous permit and/or an increase to existing permit limits.
- ☐ A UPDES permit renewal with no changes in facility operations.

**Utah Division of Water Quality
Level II Antidegradation Review Form**

Part B. Determination of Need for Level II Review

This section of the form is intended to help applicants determine if a Level II ADR is required for specific permitted activities. In addition, the Executive Secretary may require a Level II ADR for an activity with the potential for major impact on the quality of waters of the state (R317-2-3.5a.1).

B1. The UPDES permit is new or is being renewed and the proposed effluent concentration and loading limits are higher than the concentration and loading limits in the previous permit and any previous antidegradation review(s).

☒ **Yes** (Proceed to Part B2 of the Form)

☐ **No** No Level II ADR is required and there is no need to proceed further with review questions.

B2. Will any pollutants use assimilative capacity of the receiving water, i.e. do the pollutant concentrations in the effluent exceed those in the receiving waters at critical conditions? For most pollutants, effluent concentrations that are higher than the ambient concentrations require an antidegradation review. For a few pollutants, such as dissolved oxygen, an antidegradation review is required if the effluent concentrations are less than the ambient concentrations in the receiving water. (Refer to Section 3.3 of Implementation Guidance)

☒ **Yes** (Proceed to Part B3 of the Form)

☐ **No** No Level II ADR is required and there is no need to proceed further with review questions.

B3. Are water quality impacts of the proposed project temporary and limited (Section 3.3.3 of Implementation Guidance)? Proposed projects that will have temporary and limited effects on water quality can be exempted from a Level II ADR.

☐ **Yes** Identify the reasons used to justify this determination in Part B3.1 and proceed to Part G. No Level II ADR is required.

☒ **No** A Level II ADR is required (Proceed to Part C)

**Utah Division of Water Quality
Level II Antidegradation Review Form**

B3.1 Complete this question only if the applicant is requesting a Level II review exclusion for temporary and limited projects (see R317-2-3.5(b)(3) and R317-2-3.5(b)(4)). For projects requesting a temporary and limited exclusion please indicate the factor(s) used to justify this determination (check all that apply and provide details as appropriate) (Section 3.3.3 of Implementation Guidance):

- ☒ Water quality impacts will be temporary and related exclusively to sediment or turbidity and fish spawning will not be impaired.

Factors to be considered in determining whether water quality impacts will be temporary and limited:

- a) The length of time during which water quality will be lowered:
- b) The percent change in ambient concentrations of pollutants:
- c) Pollutants affected:
- d) Likelihood for long-term water quality benefits:
- e) Potential for any residual long-term influences on existing uses:
- f) Impairment of fish spawning, survival and development of aquatic fauna excluding fish removal efforts:

Additional justification, as needed:

**Utah Division of Water Quality
Level II Antidegradation Review Form**

LEVEL II ANTIDEGRADATION REVIEW

Part C, D, E, and F of the form constitute the Level II ADR Review. The applicant must provide as much detail as necessary for DWQ to perform the antidegradation review. Questions are provided for the convenience of applicants; however, for more complex permits it may be more effective to provide the required information in a separate report. Applicants that prefer a separate report should record the report name here and proceed to Part G of the form.

Optional Report Name:

**Utah Division of Water Quality
Level II Antidegradation Review Form**

Part C. Statement of Social, Economic and Environmental Importance

This section determines whether the degradation from the project is necessary to accommodate important social and/or economic development in the area in which the waters are located. The applicant must provide as much detail as necessary for DWQ to concur that the project is socially and economically necessary when answering the questions in this section. More information is available in Section 6.2 of the Implementation Guidance.

C1. Describe the proposed project or activity that requires a discharge of pollutants to waters of the State of Utah.

Washington County Water Conservancy District (WCWCD or District) owns and operates the Sand Hollow Groundwater Treatment Plant (SHGWTP), a drinking water facility designed to treat primarily arsenic and manganese in groundwater. Arsenic and other contaminants are removed through a dual media pressure filter. The main treatment process involves pre-oxidation with chlorine, coagulation (Ferric Chloride), and pressure filtration with sand and anthracite media.

Waste from the filter backwashing is pumped to solar drying beds, which primarily rely on evaporation. However, as a backup we request that a portion of the decant (clarified) water from the drying beds be permitted to discharge to the environment (i.e., the West Dam Drains) in the event that evaporation rates are not high enough to dry the solids. Instead of discharging the decanted water slowly over the year, the District is requesting that the water be discharged yearly over a few days period to enhance operational flexibility and reduce power costs.

C2. Describe the social and economic benefits that would be realized through the proposed project, including the number and nature of jobs created and anticipated tax revenues.

WCWCD owns and operates the West Dam Springs Pump Station, Water System #27073, and the Sand Hollow Well Field. The Sand Hollow Groundwater Treatment Plant (SHGWTP) provides the capability to blend and treat water from the Sand Hollow wells. Arsenic concentrations in several wells exceed drinking water standards, requiring blending or treatment prior to culinary use. The treatment facility produces potable water that meets regulatory requirements and supplies reliable drinking water to WCWCD customers. This infrastructure is critical for maintaining adequate water supply and addressing increasing demands associated with regional population growth.

C3. Describe any environmental benefits to be realized through implementation of the proposed project.

Not applicable.

C4. Describe any social and economic losses that may result from the project, including impacts to recreation or commercial development.

**Utah Division of Water Quality
Level II Antidegradation Review Form**

None.

C5. Summarize any supporting information from the affected communities on preserving assimilative capacity to support future growth and development.

The proposed discharge of decant water from the solar drying beds is anticipated to have a minimal impact on Sand Hollow Reservoir. Only a small, infrequent volume of additional flow would be returned to the reservoir, and the drying bed process allows the majority of solids and associated contaminants to settle prior to decanting. Decant discharge would not occur year-round and would be limited to periods of low evaporation and high water production, when evaporation alone is insufficient to remove accumulated water. Additionally, the proposed approach to discharge the decant water as a single, isolated event once per year further reduces the total discharge volume and associated constituent loading compared to the previously permitted discharge configuration. By minimizing both the frequency of discharge, this approach supports preservation of assimilative capacity within Sand Hollow Reservoir, helping to maintain water quality compliance while allowing WCWCD to continue meeting current and future water supply needs associated with regional growth.

C6. Describe any structures or equipment associated with the project that will be placed within or adjacent to the receiving water.

The SHGWTP has already been constructed and no new buildings are currently being added. A description of each structure is provided herein. The main treatment process involves pre-oxidation with chlorine, coagulation (ferric chloride) and pressure filtration with sand and anthracite media and air scour capabilities, followed by post-chlorination. This is housed in a single structure. Backwash waste flows from the filters are pumped to a square, concrete backwash clarifier. Water within the clarifier is decanted and returned to the front of the plant. Periodically, the sludge in the tank bottom is removed through a blowdown process and is pumped to the drying beds for further processing. These decant and sludge pumps are housed in a pump building adjacent to the backwash clarifier. Water within the drying beds is removed through evaporation. However, in the event that the water production exceeds the evaporation rate, decanted water will be sent to the West Dam drains, which eventually runs to the Sand Hollow Reservoir. Dried sludge is removed and hauled to a local landfill.

**Utah Division of Water Quality
Level II Antidegradation Review Form**

Part D. Parameters of Concern

This section identifies and ranks the parameters of concern from increasing to decreasing potential threat to beneficial uses of the receiving waters. Parameters of concern are constituents in the effluent at concentrations greater than ambient concentrations in the receiving water. The applicant is responsible for identifying parameter concentrations in the effluent and UDWQ will provide parameter concentrations for the receiving water through the wasteload allocation. More information is available in Section 3.3.3 of the Implementation Guidance.

D1. Parameters of Concern:

Rank	Pollutant	Ambient		Effluent	
		Concentration/ Units	Basis	Concentration/ Units	Basis
1	Total Dissolved Solids (TDS)	536	1 sampling event	676	1 sampling event
2	Total Suspended Solids (TSS)	ND	1 sampling event	6 mg/L	1 sampling event
3	Arsenic	0.0024 mg/L	1 sampling event	0.0046 mg/L	1 sampling event
4	Iron	0.03 mg/L	1 sampling event	0.45 mg/L	1 sampling event
5	Manganese	0.0026 mg/L	1 sampling event	0.0071 mg/L	1 sampling event
6					
7					
8					
9					
10					

D2. Parameters Present in the Effluent Not Considered Parameters of Concern:

Pollutant	Ambient Concentration	Effluent Concentration	Justification
Nitrate as N	ND	0.55 mg/L	
Total Phosphorus, as P	ND	0.02 mg/L	

**Utah Division of Water Quality
Level II Antidegradation Review Form**

**Utah Division of Water Quality
Level II Antidegradation Review Form**

Part E. Alternative Analysis

Level II ADRs require the applicant to determine whether there are feasible less-degrading alternatives to the proposed project. For new and expanded discharges, the Alternatives Analysis must be prepared under the supervision of and stamped by a Professional Engineer registered with the State of Utah. DWQ may grant an exception from this requirement under certain circumstances, such as the alternatives considered potentially feasible do not include engineered treatment alternatives. More information regarding the requirements for the Alternatives Analysis is available in Section 5 of the Implementation Guidance.

E1. Attach as an appendix to this form a report that describes the following factors for all alternative treatment options 1) a technical description of the treatment process, including construction costs and continued operation and maintenance expenses, 2) the mass and concentration of discharge constituents, and 3) a description of the reliability of the system, including the frequency where recurring operation and maintenance may lead to temporary increases in discharged pollutants. Most of this information is typically available from a Capital Facility Plan, if available.

Report Name: Carollo Level II ADR Memo

E2. Describe the proposed method and cost of the baseline treatment alternative. The baseline treatment alternative is the minimum treatment required to meet water quality based effluent limits (WQBEL) as determined by the preliminary or final wasteload analysis (WLA) and any secondary or categorical effluent limits.

The treatment method is as described in section C6. Water within the drying beds will be removed through evaporation. However, in the event that the water production exceeds the evaporation rate, decanted water will be sent to the West Dam drains, which eventually runs to the Sand Hollow Reservoir. Dried sludge will be removed and hauled to a local landfill. The cost of the treatment is coupled within the \$9.4 million dollar construction project constructed in 2020.

E3. Were any of the following alternatives feasible and affordable?

Alternative	Feasible	Reason Not Feasible/Affordable
Pollutant Trading	☐ Yes ☒ No	Not applicable
Water Recycling/Reuse	☒ Yes ☐ No	Intention
Land Application	☐ Yes ☒ No	Not applicable
Connection to Other Facilities	☐ Yes ☒ No	Not applicable
Upgrade to Existing Facility	☐ Yes ☒ No	Facility recently constructed, no upgrades needed
Total Containment	☐ Yes ☒ No	Not applicable
Improved O&M of Existing Systems	☐ Yes ☒ No	Not applicable
Seasonal or Controlled Discharge	☒ Yes ☐ No	Intention
New Construction	☐ Yes ☒ No	Facility recently constructed
No Discharge	☐ Yes ☒ No	Not possible

**Utah Division of Water Quality
Level II Antidegradation Review Form**

**Utah Division of Water Quality
Level II Antidegradation Review Form**

E4. From the applicant's perspective, what is the preferred treatment option?

The preferred alternative, as discussed in the ADR memo is to reduce the discharge from 3,600 gpd, potentially year-round, to a single annual discharge event. This alternative to the current discharge limit lowers the total annual discharge from 0.936 million gallons per year to 0.216 million gallons per year.

E5. Is the preferred option also the least polluting feasible alternative?

☒ Yes

☐ No

If no, what were less degrading feasible alternative(s)?

If no, provide a summary of the justification for not selecting the least polluting feasible alternative and if appropriate, provide a more detailed justification as an attachment.

E6. Describe any optional mitigation to compensate for the proposed water quality degradation?

N/A

**Utah Division of Water Quality
Level II Antidegradation Review Form**

Part F. Public Notice

Level II ADRs require an opportunity for the public and interested parties to review and comment on the documentation. UDWQ conducts the mandatory Public Notice once the Level II ADR has been reviewed and is considered complete, which typically occurs with the environmental determination or the draft UPDES permit. Level II ADRs are public noticed for a minimum 30 day comment period. More information is available in Section 3.7.1 of the Implementation Guidance.

F1. Does the applicant want to conduct optional public review(s) of components of the Level II ADR in addition to the mandatory public review?

- ☐ **Statement of Social, Economic and Environmental Importance**
- ☐ **Parameters of Concern**
- ☐ **Alternatives Analysis**

**Utah Division of Water Quality
Level II Antidegradation Review Form**

Part G. Certification of Antidegradation Review

G1. Applicant's Certification

The form must be signed by the same responsible person who signed the accompanying UPDES permit application per UAC R317-8-3.1(3) or 401 Certification.

Based on my inquiry of the person(s) who manage the system or who prepared the documentation, the information in this form and associated documents is, to the best of my knowledge and belief, true, accurate, and complete.

Print Name: Jordan Jones

Signature: *Jordan Jones*
Jordan Jones (Mar 26, 2026 10:14:48 MDT)

Date: 26/03/2026

G2. Professional Engineer's Certification

The Alternatives Analysis must be prepared under the supervision of and stamped by a Professional Engineer registered with the State of Utah. UDWQ may grant an exception from this requirement under certain circumstances, such as the alternatives considered potentially feasible do not include engineered treatment alternatives.

The Alternatives Analysis was prepared under my supervision and the information in this form and associated documents is, to the best of my knowledge and belief, true, accurate, and complete. Apply the Professional Engineer stamp below.

Print Name: Stetson Bassett

Professional Engineer License Number: 12149234-2202

Signature: *Stetson Bassett*
Stetson Bassett (Mar 26, 2026 10:14:17 MDT)

Date: 26/03/2026

Level II Antidegradation Review Form

Final Audit Report

2026-03-26

Created:	2026-03-26
By:	Jordan Jones (jordan@wcwcd.org)
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WASHINGTON COUNTY WATER CONSERVANCY DISTRICT

Level II ADR

Project No.: 203931
Date: March 19, 2026
Prepared By: Stetson Bassett, Carollo Engineers, Inc.
Subject: Flow Change Request



1.0 OVERVIEW

Washington County Water Conservancy District (District) owns and operates the Sand Hollow Groundwater Treatment Plant, a drinking water facility designed to treat groundwater with elevated concentrations of arsenic and manganese. Treatment is accomplished using a dual-media pressure filtration process, which includes pre-oxidation with chlorine, coagulation using ferric chloride, and filtration through sand and anthracite media to produce potable water that meets drinking water standards.

Waste washwater generated during filter backwashing is pumped to onsite solar drying beds for solids management, where dewatering primarily occurs through evaporation. As a contingency for periods when evaporation rates are insufficient to fully dry the solids, the District is requesting authorization to discharge a portion of the clarified decant water from the drying beds to the Sand Hollow Reservoir via the West Dam drains. Rather than discharging small volumes intermittently throughout the year, the District proposes to discharge the accumulated decant water during a limited, short-duration event occurring no more than once per year. This approach provides operational flexibility, improves system efficiency, and reduces overall power consumption while maintaining protective environmental controls.

2.0 EXISTING CONDITION AND NEW ALTERNATIVE

The existing Utah Pollutant Discharge Elimination System permit authorizes a maximum discharge of 3,600 gallons per day (gpd) up to five days per week year-round. Under the requested alternative, the allowable discharge would be modified to a maximum of 72,000 gpd during a single, short-duration event occurring no more than once per year and lasting three days. This proposed operational change would result in a substantial reduction in the total annual discharge volume to Sand Hollow Reservoir compared to the current permitted configuration. A comparison of the existing permit limits and the proposed alternative, including total annual discharge volumes, is provided in Table 1.

Table 1 Yearly Discharge from Outfall 001

	Discharge to Reservoir	Total Annual Discharge
Current Discharge Volume Allowed	3,600 gpd	936,000 gal/yr
Proposed Alternative Discharge Volume	72,000 gpd*	216,000 gal/yr

Notes:

*Proposed discharge to occur for a maximum period of three days per year.

gal/yr - gallons per year

Because the single annual event discharge occurs infrequently and over a short duration, no measurable impacts to the reservoir are anticipated. The temporary discharge to Sand Hollow Reservoir may result in a minimal rise in sediment and metals loading; however, this increase would be negligible relative to the reservoir's approximately 50,000-acre-foot capacity. All pollutants currently monitored have consistently remained well below established permit limits. The annual permitted discharge would decrease by 720,000 gal/yr. The proposed modification will enhance operational flexibility and efficiency and reduce energy use.

2.1 Pollutants of Concern

Seven contaminants have been identified as pollutants of concern for the receiving water: total dissolved solids (TDS), total suspended solids (TSS), arsenic, iron, and manganese. Table 2 shows the effluent concentrations of these pollutants and the annual mass loading in pounds.

Table 2 Pollutant Mass Loading

Pollutant	Effluent Concentration	Current Annual Mass Loading	Alternative Annual Mass Loading
TDS			
TSS	6 mg/L	46.8 lbs	10.8 lbs
Arsenic	0.0046 mg/L	0.036 lbs	0.008 lbs
Iron	0.45 mg/L	3.5 lbs	0.81 lbs
Manganese	0.0071 mg/L	0.055 lbs	0.013 lbs

Notes:

lbs - pounds; mg/L - milligrams per liter

As presented in the table, the alternative discharge limits significantly decrease the amount of pollutant entering Sand Hollow Reservoir over the year. We believe the proposed alternative provides the best path forward for reducing contaminants while maintaining operational flexibility at the Sand Hollow Groundwater Treatment Plant.

Pending Draft

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