

FACT SHEET / STATEMENT OF BASIS
JORDAN VALLEY WATER CONSERVANCY DISTRICT
SOUTHWEST GROUNDWATER TREATMENT PLANT
NEW PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0025836
MAJOR INDUSTRIAL

FACILITY CONTACTS

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Facility Name: Southwest Groundwater Treatment Plant
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DESCRIPTION OF FACILITY

The Southwest Groundwater Project will remediate groundwater contaminated from historic mining activities in southwest Salt Lake County. This project will improve groundwater quality and prevent further contaminant migration in the Salt Lake Valley. The project will extract groundwater with elevated total dissolved solids (salts) via a series of deep aquifer wells and purify the extracted water utilizing a reverse osmosis (RO) treatment process at the Southwest Groundwater Treatment Plant (SWGWTP). The project will also extract groundwater from shallow wells with elevated total dissolved solids that have not been impacted by mining activities. The SWGWTP is owned and operated by the Jordan Valley Water Conservancy District (JVWCD).

The drinking quality water generated will be distributed by JVWCD to its member agencies for supply to their drinking water systems. RO byproduct water (i.e. concentrate), containing the extracted salts from the treated water, will be routed via a 21 mile pipeline to Gilbert Bay of the Great Salt Lake (GSL). Initial construction of the SWGWTP will have a capacity of seven million gallons per day (MGD) of treated drinking quality water and will discharge a maximum of 1.5 MGD of byproduct. At ultimate build out, the treatment plant capacity will increase to 14 MGD with 3 MGD of byproduct to be discharged to GSL.

Normal discharges under this permit will be via Outfall 001 to Gilbert Bay of the GSL. Limited intermittent start-up flows from deep and shallow wells will be discharged through municipal storm drain systems at various times to the Jordan River and the Utah and Salt Lake Canal. Discharges of water from the shallow aquifer wells would eventually reach the Jordan River, due to the fact that the natural flow pattern of the shallow aquifer is to the Jordan River. Routine discharges of mining contaminated groundwater from the deep aquifer wells to municipal storm drains will not be allowed.

The plant will be located near the District's headquarters, adjacent to the Jordan River. The approximate address is 8215 South 1300 West.

OPERATING CONDITIONS

The following is a description of the various operating and discharge conditions that will occur at the facility. Discharges of shallow groundwater to the Jordan River will occur under well start-up, maintenance, upset and normal operating conditions. Since the Jordan River is currently impaired for TDS, it is required by R317-8-2.2 that the discharge will not cause or contribute to a violation of water quality standards.

Normal Operations

Under normal operating conditions, the RO plant will operate all treatment trains, the byproduct water will be discharged to Gilbert Bay and drinking quality water will be delivered to JWCD's member agencies.

On a near continuous basis, the RO plant will need to discharge excess feed water from pressure relief valves of the shallow aquifer treatment trains, in order to supply feed water to the plant at a constant pressure and flow. It is expected that the flow will average 1 MGD, most days of the year. The excess flows from the pressure relief valves for the deep aquifer treatment trains will be discharged to Gilbert Bay of the GSL via the by-product pipeline.

Pump to Waste Start-Up Condition

The Southwest Groundwater Project includes shallow and deep aquifer wells. These wells will pump to waste intermittently at start-up of the well pump, to purge the well casings of suspended solids after shut down and before pumping the water to the RO plant. It is intended that the wells will pump and supply feed water to the project on a continuous basis. The start-up conditions are only expected to occur infrequently, each time a well is started up. The wells will pump to waste at their individual locations to the municipal storm drain systems which flow to either the Utah and Salt Lake Canal or the Jordan River. Based on wasteload analysis completed for each well location, it is expected that these discharges will not cause or contribute to a violation of water quality standards and therefore will not have effluent limits associated with the discharges. Reporting of duration and frequency of each discharge will be required. The reporting of these discharges will be provided to the Division of Water Quality (DWQ) in an annual project operating report.

Cleaning and Maintenance Conditions for the Shallow Aquifer Wells

The RO plant will require routine cleaning and maintenance. Under this maintenance condition, which will occur up to 90 days a year, the feed water from the shallow wells will be diverted to the Jordan River and not enter the RO plant. Under these maintenance conditions, the feed water from the deep aquifer wells will be discharged to Gilbert Bay via the byproduct pipeline.

The total flow of the combined discharges from cleaning, maintenance and pressure relief conditions will not exceed a maximum of 4.6 MGD. The combined discharge, of uncontaminated shallow groundwater, would eventually reach the Jordan River naturally. A wasteload calculated for the shallow well discharges to the Jordan River under these conditions show that water quality standards will not be violated as a result of these discharges.

Upset Conditions

In the event of a power outage at SWGWTP the portion of the deep well water that exceeds 1,200 mg/l TDS would be directed to Outfall 001 and discharged to Gilbert Bay. Shallow groundwater would be discharged to the Jordan River via Outfall 002. Deep wells which have been identified to contain TDS concentration less than 1,200 mg/L will be discharged at the well sites to municipal storm drains.

MONITORING PROGRAMS

Great Salt Lake Monitoring Program

The DWQ's review of the proposed discharge to the GSL has identified selenium and mercury as two constituents of concern. Both of these constituents have the potential to adversely affect aquatic and aquatic-dependant wildlife in both Gilbert Bay and the transitional waters (mudflat wetlands). In addition to Narrative Standards, a tissue based selenium water quality standard exists for Gilbert Bay of the GSL. No numeric mercury water quality standard exists for the GSL, only Narrative Standards.

The following paragraphs outline how the permit will be protective of the aquatic and aquatic-dependant wildlife beneficial uses for the receiving water.

Selenium Effluent Limit for Outfall 001 to Gilbert Bay of Great Salt Lake

To date, a water column numeric criterion for Selenium has not been established for the GSL. However, the DWQ has adopted a tissue based standard using the complete egg/embryo of aquatic dependent birds with tiered management responses should future increases of selenium in egg tissue be observed. All UPDES discharges into Gilbert Bay of the GSL must comply with this tissue based standard for selenium. When more than one permittee is required to sample bird eggs from a common area, DWQ strongly recommends that the permittees cooperate to jointly complete the annual monitoring program and not needlessly duplicate monitoring and further impact aquatic birdlife in the area of the outfalls.

No numeric standard for Se is available for the transitional waters (mudflat wetlands, Class 5E) between the outfall and Gilbert Bay. This area is a saline mudflat created when the GSL receded. DWQ will apply the Gilbert Bay selenium standard to these Class 5E waters to assess compliance with the Narrative Standard, *UAC R317-2-7.2*. The effluent concentration limit for the SWGWTP is the same as the Kennecott Utah Copper limit. Although data for selenium in bird eggs collected near the Kennecott Utah Copper outfall 012 are limited, all available evidence suggests that current conditions meet the tissue-based standard and that aquatic life uses of Gilbert Bay and its surrounding wetlands are fully supported.

The water concentration of selenium of 27 µg/l after the mixing zone in GSL is predicted to not exceed a concentration detrimental to brine shrimp, GSL algae, or water-dependent birds. The water column concentration is based on a 2001 ecological risk assessment conducted by Kennecott Utah Copper and was used to develop their effluent limit for Selenium. As discussed in Chapter 9 the *Great Salt Lake Selenium Standard: Final Report*, the currently available data is inadequate to accurately predict the correlation between selenium water and bird egg concentrations. In addition, in Appendices G and H, the U.S. Geological Survey estimates annual loading of selenium to Gilbert Bay from all quantified sources at about 1,500 kg, including a Kennecott Utah Copper 5-year maximum load that hasn't exceed 843 kg/yr. Another 1,500 kg/yr is potentially unaccounted, for a total of 3,000 kg/yr from all sources. Loading increases of up to 300% (4,500 kg/yr to 9,000 kg/yr) are predicted to remain protective of the tissue-based

standard.

(http://www.deq.utah.gov/Issues/GSL_WQSC/docs/GLS_Selenium_Standards/index.htm). The additional SWGWTP discharge will not exceed an annual load of 224 kg/yr of selenium.

Nevertheless, some uncertainty remains about the potential effects of selenium on the biota of the GSL, despite numerous studies conducted by DWQ and others over the past five years. As a result, this permit contains extensive monitoring requirements that will allow continued evaluation of the underlying assumptions upon which these permit limits are based. These data evaluations, coupled with the tiered management responses associated with the numeric selenium standard, will allow the DWQ to confirm that the beneficial uses for Gilbert Bay and transitional waters will continue to be supported.

Mercury Effluent Limit for Outfall 001 to Gilbert Bay of the Great Salt Lake

A numeric mercury criterion has not yet been developed for the GSL. However, the results of recent scientific investigations suggest that mercury should be considered in this permit. In 2005 and 2006, average mercury concentrations in excess of 0.3 parts per million (ppm) were observed in the adults of three species of birds on the GSL. As a result, health advisories were issued for human consumption of these species. Other observational studies have measured contaminant levels and looked for evidence of toxicity in the birds. These studies include:

- U.S. Fish and Wildlife Service (USFWS). 2009. *Assessment of Contaminants in the Wetlands and Open Waters of the Great Salt Lake, Utah 1996-2000*
- Vest, J.L., M.R. Conover, C. Perschon, J. Luft, and J.O. Hall. 2009. Trace Element Concentrations in Wintering Waterfowl from Great Salt Lake. *Arch. Environ. Contam. Toxicol.* 56:302-316
- Conover, M.R. and J.L. Vest. 2008. Selenium and Mercury Concentrations in California Gulls Breeding on the Great Salt Lake, Utah, USA. *Environ. Tox. Chem.*

The absence of observed health effects in GSL birds is not conclusive but does provide a line of evidence that contaminant exposures are below levels where frank toxic effects are observed. Based upon data collected by the U.S. Geological Survey, the total annual mercury load for the GSL from atmospheric and riverine sources is 38 kg/yr. Air deposition constitutes the majority of this load at 32 kg/yr or 84% of the total load. Riverine sources contribute 6 kg/yr or 16% of the total load.

As previously mentioned, a water quality based standard for mercury for the GSL has not been established to date. In order to ensure that mercury loading from the SWGWTP does not negatively impact the receiving water, the effluent load is capped at 1% of the total mercury load for the GSL or 0.38 kg/yr. DWQ considers this value to be insignificant relative to other mercury sources.

DWQ continues to conduct investigations into the potential effects of mercury on GSL biota. Ultimately, these evaluations may suggest that mercury effects on Great Salt Lake biota warrant a finding that the aquatic life uses are impaired due to mercury pollution. In this scenario, DWQ would be required to develop a TMDL and associated mitigation plan. The mitigation plan may call for point source reductions in mercury, in which case this permit would be reopened and modified accordingly.

JVWCD will be required to monitor the methyl mercury and total mercury concentrations of the byproduct in April and June of each year to ascertain if mercury methylation is occurring in the 21 mile pipeline. DWQ anticipates that the byproduct mercury monitoring requirements may be

modified in the future to eliminate the sampling requirement, pending the outcome of these characterization efforts.

Deep Aquifer Characterization Compliance Schedule

To date, JVVCD has not fully characterized the low-level mercury concentrations in the deep aquifer. Preliminary samples were not analyzed using a low-level detection method nor was a water sample obtained that was representative of the water quality from the aquifer. A subsequent round of monitoring was conducted and analyzed using a low-level detection method for mercury with representative water samples but, due to a laboratory QA/QC error, the reported concentrations do not meet the data quality objectives. A compliance schedule will be included in the permit to allow the facility one year from the effective date of the permit to fully characterize the aquifer. In the interim, DWQ believes the 0.38 kg/yr mercury load limit from this discharge is insignificant relative to other mercury sources to the GSL and should be protective.

DISCHARGE

DESCRIPTION OF DISCHARGE

Outfall Description of Discharge Point

- 001 Located at latitude 40°45'37.59"N and longitude 112°10'13.32"W. The discharge is through a 12-inch diameter pipe directly to Gilbert Bay of the Great Salt Lake. The compliance monitoring point is at the SWGWTP prior to effluent entering the pipeline. (Except for end of pipe monitoring as required in *Part I.D. Self Monitoring and Reporting Requirements, Footnotes b/ and e/* of the UPDES permit.)
- 002 Located at latitude 40°36'5.58"N and longitude 111°55'13.37"W. The discharge will consist only of untreated shallow groundwater that has not been impacted by mining activities through a 30-inch diameter pipe from the river discharge vault at the RO Plant to the Jordan River.

RECEIVING WATERS AND STREAM CLASSIFICATION

The final discharge is of RO concentrate to Gilbert Bay of the GSL via Outfall 001. Discharges of untreated shallow groundwater may occur to the Jordan River via Outfall 002.

The Gilbert Bay of the GSL is classified as Class 5A. The Transitional Waters along the Shoreline of the Great Salt Lake are classified as 5E. The Jordan River is classified as Class 2B, 3A and 4.

- Class 2B -Protected for secondary contact recreation such as boating, wading, or similar uses.
- Class 3A -Protected for cold water species of game fish and other cold 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.
- Class 5A -Gilbert Bay of the GSL. Protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.
- Class 5E -Transitional Waters along the Shoreline of the GSL geographical boundary. Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

BASIS FOR EFFLUENT LIMITATIONS

Effluent limits for the JWCD SWGWTP are based on Utah Secondary Treatment Standards, Utah Water Quality Standards and best professional judgment (BPJ).

Outfall 001, RO Concentrate

The RO plant concentrates the pollutants found in the intake (or feed) water by a factor of five. The byproduct flows in a 21 mile pipeline and is ultimately discharged to Gilbert Bay of the GSL. Limitations on total suspended solids (TSS) and pH are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The Oil and Grease limitation is based on Best Professional Judgment (BPJ). Because there is no water column standard for selenium for the GSL, the daily max limitation on total selenium is the same as the effluent limitation for Kennecott Utah Copper's Outfall 012 and is based on studies completed by Kennecott in 2001. The selenium tissue based standard is based upon *R317-2-14*. The annual maximum load for mercury is based upon a maximum of 1% of the total mercury load for the GSL of 38 kg/yr.

The permit effluent limitations are:

Parameter	Effluent Limitations Outfall 001 <u>a/b/c/d/e/</u>				
	Max Monthly Average	Max Weekly Average	Daily Min	Daily Max	Annual Max
Total Flow, MGD <u>f/g/</u>	3.0				
Selenium, total, mg/L				0.054	
Selenium, kg/year					224
Selenium <u>h/</u>					
TSS, mg/L	25	35		70	
Mercury, kg/yr <u>i/j/</u>					0.38
Oil & Grease, mg/L				10	
pH, Standard Units			6.5	9.0	

a/ See definitions Part I.A. for definition of terms.

b/ All parameters in this table will be reported monthly in the monthly Discharge Monitoring Report.

c/ Metals samples should be analyzed using a method that meets MDL requirements. If a test method is not available the permittee must submit documentation to the Executive Secretary regarding the method that will be used. The sample type (composite or grab) should be performed according to the methods requirements.

d/ There shall be no visible sheen or floating solids or visible foam in other than trace amounts.

e/ There shall be no discharge of sanitary wastes.

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

g/ The flow rates and durations of all discharges shall be reported in the Annual Project Operating Report.

h/ Implementation of the selenium water quality standard of 12.5 mg/kg for Gilbert Bay of the GSL is outlined in Part I.D.8 of the UPDES Permit.

i/ Mercury samples must be analyzed using Method 1631 or other sufficiently sensitive

method. The sample type (composite or grab) should be performed according to the method's requirements.

- j/ This load constitutes 1% of the annual mercury load entering the GSL from all sources for this parameter and may change once the aquifer is fully characterized or other information on the effluent or receiving water becomes available.

Great Salt Lake Monitoring Program

A comprehensive sampling and analysis plan for egg, water, sediment and macroinvertebrates including field and laboratory SOPs and methods must be approved by the Executive Secretary of the DWQ prior to sampling. This plan will be made available for public review and comment as part of the Executive Secretary's review process. A compliance schedule will be included in the permit that requires JVWCD to submit the sampling and analysis plan by February 1, 2011, 90 days prior to the beginning of the nesting season. If lake levels rise significantly during this permit cycle, an alternate sampling plan, including methods and locations, must be submitted to the Executive Secretary for approval prior to February 1 of that year.

JVWCD is required to annually sample eight (8) bird eggs, if available, but not to exceed 20% of available eggs, during the nesting season, May 1 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the joint JVWCD outfall 001 and Kennecott 012 outfall area. These samples will be subject to the assessment procedures incorporated in *R317-2-14*, as a part of the tissue based selenium water quality standard of 12.5 mg/kg dry weight for Gilbert Bay of the GSL. In addition, both total and methyl mercury must be evaluated and reported.

Once a year when eggs are collected for selenium and mercury analysis, JVWCD must collect co-located macroinvertebrate, water and sediment samples. The macroinvertebrate, water and sediment samples must be collected near the discharge point and edge of the GSL waters, at six (6) evenly spaced locations.

JVWCD will conduct annual bird surveys approximately every two weeks between May 1 and June 30 (four times per season) to document bird abundance, diversity, and use of the Outfall 001 mud flat habitat, particularly for evidence of feeding and nesting.

As previously discussed, DWQ strongly recommends that egg sampling be coordinated with other permittees that discharge in the same delta to avoid needless duplication and further impact to avian wildlife in the area. Other monitoring requirements may be shared if appropriate. The Executive Secretary shall be notified as soon as possible, but no later than April 1, if the efforts to coordinate monitoring with other dischargers to the delta area are unsuccessful. The detailed field and laboratory data, analysis and a summary of the results from the bird surveys, egg samples and co-located water, sediment and macroinvertebrates monitoring must be submitted to the DWQ by March 1 following the end of the calendar year for which the results were obtained as a part of the Annual Project Operating Report.

Outfall 002, Shallow Aquifer Discharges to the Jordan River

During times of plant maintenance and to dispose of excess groundwater, the facility will need to discharge shallow well feed water (untreated groundwater) to the Jordan River. The limitation on

TSS and pH are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The Oil and Grease is based on BPJ. Due to uncertainties in plant operations, the DWQ will include a load limit for selenium based upon a continuous pressure relief bleed flow of 1.0 MGD 270 days a year and a flow of 4.6 MGD for 90 days a year. The flow of 4.6 MGD is a combination of pressure relief bleed flow and feed water discharged as a result of maintenance activities. The selenium concentration used to calculate the load is based upon the anticipated effluent concentration of 7.9 ug/L plus a 30% safety factor. The resulting concentration is 10.3 ug/L. Wasteloads calculated based upon flows of 1 MGD and 4.6 MGD resulted in allowable selenium concentrations of 17.4 ug/L and 63.4 ug/L respectively. Based on this, an effluent limit of 10.3 ug/L is sufficiently protective. The limitation on TDS is based on Utah Water Quality Standards. The permit limitations are:

Parameter	Effluent Limitations Outfall 002 a/b/c/d/e/				
	Max Monthly Average	Max Weekly Average	Daily Min	Daily Max	Annual Max
TDS, mg/L				1,200	
Selenium, total, kg/yr					26.4
TSS, mg/L	25	35		70	
Oil & Grease, mg/L				10	
pH, Standard Units			6.5	9.0	
WET, Acute Biomonitoring, both species				Pass LC ₅₀ (EOP)	

- a/ See definitions Part I.A. for definition of terms.
- b/ All of the parameters in the above table, shall be reported monthly in the Discharge Monitoring Report.
- c/ Metals samples should be analyzed using a method that meets MDL requirements. If a test method is not available the permittee must submit documentation to the Executive Secretary regarding the method that will be used. The sample type (composite or grab) should be performed according to the methods requirements.
- d/ There shall be no visible sheet or floating solids or visible foam in other than trace amounts.
- e/ There shall be no discharge of sanitary wastes.

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are based on the Utah Division of Water Quality’s *Monitoring, Recording and Reporting Guidelines*. The permit will require reports to be submitted monthly and quarterly, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Lab sheets for biomonitoring must be attached to the biomonitoring DMR.

Parameter	Frequency	Sample Type	Units
Total Flow	Daily or Continuous	Measured	MGD
Total Mercury	Monthly	Composite or Grab	ng/L
Total Mercury <u>d/</u>	Monthly	Calculated	kg/yr
Total Selenium	2 x Weekly	Composite or Grab	mg/L
Total Selenium <u>d/</u>	Monthly	Calculated	kg/yr
TSS <u>e/</u>	2 x Weekly	Composite or Grab	mg/L
Selenium	Annually	Bird Eggs	mg/kg
Oil & Grease	Monthly if sheen is observed	Grab	mg/L
pH	Monthly	Grab	SU

- a/ See definitions Part I.A. for definition of terms.
- b/ The JWWCD shall also monitor all parameters and BOD₅, quarterly at the end of pipe for the first year of operation and then bi-annually thereafter. If lake levels rise where monitoring at end of pipe is not feasible, then JWWCD may petition the Executive Secretary to establish an alternate sampling point.
- c/ Mercury samples must be analyzed using Method 1631 or other sufficiently sensitive method. The sample type (composite or grab) should be performed according to the methods requirements.
- d/ Cumulative totals for this parameter shall be reported on the monthly Discharge Monitoring Reports.
- e/ Monitoring of this parameter is required at end of pipe during pipeline cleaning operations. Monitoring results must be included with the DMR for that monitoring period. If lake levels rise where monitoring at end of pipe is not feasible, then JWWCD may petition the Executive Secretary to establish an alternate sampling point.

Self-Monitoring and Reporting Requirements, Outfall 002 <u>a/b/c/</u>			
Parameter	Frequency	Sample Type	Units
Total Flow	Daily or Continuous	Measured	MGD
TDS	2 x Weekly	Composite or Grab	mg/L
Total Selenium	2 x Weekly	Composite or Grab	mg/L
Total Selenium <u>d/</u>	Annually	Calculated	kg/yr
TSS	2 x Weekly	Composite or Grab	mg/L
Mercury	Monthly	Composite or Grab	ng/L
Oil & Grease	2 x Weekly, if sheen is observed	Grab	mg/L
pH	2 x Weekly	Grab	SU
WET, Acute Biomonitoring	Quarterly, both species	Composite	Pass/Fail

- a/ See definitions Part I.A. for definition of terms.
- b/ Mercury samples must be analyzed using Method 1631 or other sufficiently sensitive method. The sample type (composite or grab) should be performed according to the methods requirements.

- c/ Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.
- d/ Cumulative totals for this parameter shall be reported on the monthly Discharge Monitoring Reports.

STORM WATER

The SWGWTP has a Standard Industrial Classification (SIC) of 4941, Water Supply. Facilities under this classification are not required to obtain coverage under the UPDES Multi-Sector General Permit for Storm Water Discharges from Industrial Activity, Permit Number UTR000000. The permit contains a storm water re-opener provision if requirements are needed in the future.

PRETREATMENT REQUIREMENTS

Any process wastewater that the facility may discharge to the sanitary sewer, either as direct discharge or as a hauled 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. As this project will not discharge into a POTW there will be no Pretreatment requirements.

WHOLE EFFLUENT TOXICITY (BIOMONITORING) REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the *State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring)*. 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*.

Since the permittee will be a new major industrial discharging facility, with no previous discharge to evaluate, the permit will require whole effluent toxicity (WET) biomonitoring testing at the end of pipe (EOP) from Outfall 002, which will discharge to the Jordan River. Based upon these facts and being programmatically consistent utilizing the above referenced biomonitoring guidance document, the permittee will be required to quarterly conduct and pass the acute LC₅₀ WET testing for both test species consisting of *ceriodaphnia dubia* (water flea) and *pimephales promales* (fathead minnow) as appropriate. Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration during the WET testing. Therefore, the permittee is required to "Pass" the Lethal Concentration criteria (LC₅₀) for each WET monitoring period, as detailed in the permit. Chronic WET toxicity tests have not been included in this permit because the estimated low flow receiving stream conditions, with discharges from Outfall 002, are projected to be generally greater than a 20:1 dilution ratio. This rationale is consistent with similar permits and with the WET Guidance Document referenced above. The permit also contains standard requirements for accelerated testing upon failure of a WET test, and a Preliminary Toxicity Investigation (PTI) and Toxicity Reduction Evaluation (TRE) as necessary. The permit will also contain the Toxicity Limitation Re-opener provision that allows for modification of the permit at any time to include additional WET testing requirements and/or test methods should additional information indicate the presence of toxicity in future discharges.

WET testing will not be required from Outfall 001 because the nature of the discharge (RO concentrate) and the receiving water body of the Great Salt Lake would likely inhibit successful completion of any type of WET testing due to the naturally high Total Dissolved Solids (TDS) concentrations in the proposed discharge water, as well as the receiving waters of the Great Salt Lake, thus there is no reasonable potential for toxicity from TDS to occur. Upon further evaluation, the existing concentrations of sodium, potassium and bicarbonate ions in the receiving waters would likely prohibit utilizing an approved marine organism, such as *mysidopsis bahia*, in any WET testing, as these concentrations are up to ten times higher than seawater. The Great Salt Lake is a unique inland and highly saline environment. A review of the receiving water's current water quality status indicate no further impairment of the water body other than for selenium, which has been included along with other parameters and bird egg studies as previously described monitoring requirements. The routine water quality monitoring of the discharging effluent as proposed, and continued monitoring on the GSL as well as the proposed egg sampling studies, should be adequate to indicate if a toxicity issue exists. Based upon these facts, the permitting authority's BPJ, and that the anticipated discharges are of relatively small volumes of effluent when compared to the existing water body of the Great Salt Lake, WET testing requirements will not be required for outfall 001. However, the permit will contain a toxicity limitation re-opener provision that allows for modification of the permit to include WET testing requirements and/or alternative test methods should additional information indicate the presence of toxicity in future discharges that may cause harm to the receiving waters and limited aquatic wildlife of the Great Salt Lake. This rationale is consistent with similar permits and with the WET Guidance Document referenced above.

ANTIDegradation LEVEL II REVIEW

Antidegradation Reviews are intended to ensure that waters that have better quality than required by the standards are not degraded unless the degradation is necessary for important social or economic reasons.

JVWCD has completed Antidegradation Level II Reviews for the discharge of the byproduct water to Gilbert Bay of Great Salt Lake and for the feed water from the shallow wells to the Jordan River. These documents are part of the UPDES Permit Application and are available for review.

The Level II Review for the byproduct discharge noted that discharge of the byproduct water to GSL is not the least degrading alternative nor is it the lowest cost alternative. However, given the net environmental and social benefits, it was determined that this alternative was the best option.

The DWQ concurs with the findings of the Level I (compliance with water quality standards) and Level II Reviews.

PERMIT DURATION

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

Drafted by
Kim Shelley, Discharge

Mike George, Storm Water
Jeff Studenka, Whole Effluent Toxicity
Chris Bittner, ADR and Monitoring Programs
Utah Division of Water Quality

PUBLIC NOTICE

Began:
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