



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF WATER QUALITY
Erica Brown Gaddis, PhD
Director

MEMORANDUM

TO: Sarah Leavitt, UPDES Permit Writer

FROM: Chris Bittner, Standards Coordinator

DATE: November 26, 2019

SUBJECT: Antidegradation Reviews for the Central Davis Sewer District (CDS),
UDPES Permit UT0020974

RECEIVING WATERS AND STREAM CLASSIFICATION

At current and anticipated Lake elevations for the duration of this permit, the discharge is to the Transitional Waters of Great Salt Lake and then to Farmington Bay, Great Salt Lake. According to the *Utah Administrative Code (UAC) R317-2-13*, the designated uses are:

- Class 5E Transitional Waters of Great Salt Lake. Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain
- Class 5D Farmington Bay of the Great Salt Lake. 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

Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD₅), E. coli, pH and percent removal for BOD₅ and TSS are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The Division of Water Quality has determined that this discharge does not have reasonable potential to cause or contribute to a violation of water quality standards. An Antidegradation Level II review is not required because the permit is being renewed with no changes and water quality will not be further lowered by the proposed activity, *UAC R317-2-3.5.b.1.(b)*.

No numeric criteria are available for the recreation or aquatic life uses in the Transitional Waters or Farmington Bay. The Level I anti-degradation review, protection of existing uses, was conducted in accordance with the *Interim Methods for Evaluating Use Support for Great Salt Lake Utah*

Pollution Discharge Elimination System (UPDES) Permits (v. 1.0 January 4, 2016) (*Interim Methods*). No existing uses are identified that require more stringent protection than the designated uses.

As described in the *Interim Methods*, effluent pollutant concentrations were screened against Class 3D aquatic life numeric criteria to determine reasonable potential and the protection of the uses in accordance with the Narrative Standards. No dilution was assumed for the discharge to the Transitional Waters.

The source of the effluent data and parameters was the permit application. A reasonable potential analysis was conducted assuming no dilution. No pollutants demonstrated reasonable potential to cause or contribute to an exceedance of a water quality standard. Pollutants that required further evaluation are discussed in the following section.

Updates from the 2014 permit.

Ammonia.

In 2013, the USEPA published updated water quality criteria for ammonia. The applicability of these criteria for Farmington Bay were evaluated. The evaluation concluded that these are appropriate screening values for determining effluent limits for the discharge. Ammonia is generally toxic to aquatic life but species vary widely in their sensitivity. Ammonia is also a nutrient that is taken up rapidly by plants and bacteria when present at sub-toxic concentrations. Farmington Bay includes freshwater taxa such as daphnids and mayflies¹. Fish can be sensitive to ammonia and fish have been observed in Farmington Bay and surrounding wetlands. Fish are observed in similar freshwater habitats at Great Salt Lake and fish presence in nearby waters such as waterfowl management areas and observations of fish-eating birds support that fish may be considered residents for the comparison criteria. Studies are ongoing to better characterize the distribution of fish populations in Farmington Bay. Ammonia criteria are more stringent when early life stages of fish may be present. Early life stages of fish are not considered for this permit cycle because of the lack of specific data regarding the potential fish species present in the immediate receiving waters. The 2013 USEPA ammonia criteria based on a presumed absence of unionid mussels and no salmonids was applied.

Consistent with Utah Wasteload Allocation procedures, acute limits are based on the maximum observed pH and temperature of the effluent [note: ammonia limits are very sensitive to pH and to a lesser extent temperature]. Chronic limits are based on the average pH and temperature of the effluent. Effluent pH data are available but effluent temperature data are not. The maximum and average effluent ammonia concentrations reported in the permit application are 6.1 and 3.1 mg/L, respectively. These concentrations are unlikely to trigger reasonable at the expected effluent temperatures. Effluent temperature will be added as a monitoring requirement for this permit cycle to confirm this conclusion.

Copper

The projected maximum effluent concentration is 0.042 mg/L and the copper criterion at 400 mg/L CaCO₃ hardness is 0.030 mg/L. The hardness adjustment to the criterion is limited to 400

¹ <https://documents.deq.utah.gov/water-quality/standards-technical-services/gsl-website-docs/alu-standards-development/DWQ-2019-000534.pdf>

mg/L which the effluent can exceed and the receiving waters do exceed. This suggests that the Class 3D criterion may be unnecessarily stringent. The EPA copper biotic ligand model provides more refined estimates of a protective copper criterion. For this permit cycle, monthly monitoring for parameters to support application of the copper biotic ligand model were added. The new parameter is dissolved organic carbon that is added to monitoring requirements for copper, pH and temperature monitoring. These parameters must be measured on the same day. The copper criterion can be further refined if the CDSO chooses to also simultaneously measure alkalinity, major cations (calcium, magnesium, sodium, and potassium), and major anions (sulfate, chloride). Default values will be used for these optional parameters if site-specific data are unavailable.

Total Residual Chlorine

The average effluent concentrations of total chlorine were 1.4 mg/L. The 4-day criterion is 0.011 mg/L. The difference between these values is potentially overstated. Total residual chlorine is challenging to measure accurately and the available analytical methods have insufficient sensitivity. A monitoring requirement for total residual chlorine will be added as a monitoring requirement for this permit cycle with the goal of determining the sensitivity of the existing methods and supporting future reasonable potential analyses.

Selenium

The reasonable potential analyses projected a maximum effluent concentration of 0.0047 mg/L and the 4-day average criterion is 0.0046 mg/L. Although the maximum potential effluent concentration exceeds the criterion, selenium is concluded to not have reasonable potential because the presence of fish in the immediate receiving waters is uncertain. The criterion is based on primarily on protecting fish and other forms of aquatic life are much less sensitive. Waterfowl and shorebirds are likely present in the immediate receiving waters but the data regarding selenium concentrations in bird eggs from Farmington Bay support that adverse effects are unlikely (see Ackerman et al. 2015 <https://pubs.er.usgs.gov/publication/ofr20151020>).

Whole Effluent Toxicity (WET) Testing

The requirements for WET testing are unchanged from the last permit cycle with acute testing quarterly and chronic testing as an indicator. Both tests are conducted with 100 percent effluent. The CDSO passed all of the acute WET testing during the last permit cycle. One chronic WET test was repeated after the first one did not meet the IC₂₅. The dose-response observed suggests the results of the first test were anomalous and the toxicity was not verified for the follow-up test and a pattern of toxicity was not demonstrated. The WET permit language was updated consistent with Utah's 2018 WET Implementation Guidance.