



State of Utah

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Department of
Environmental Quality

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DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

MEMORANDUM

TO: Walt Baker, P.E., Director

THROUGH: Daniel Griffin, Permit Writer

FROM: Chris Bittner, Standards Coordinator

DATE: March 10, 2016

SUBJECT: Antidegradation Reviews for the North Davis Sewer District (NDSD)
UPDES Permit UT0021741 Renewal

Summary: Based on the evaluation of the available effluent data, the uses designated in R317-2-12 and existing uses of the receiving waters (Transitional Waters to Farmington Bay and Farmington Bay, Great Salt Lake) will be protected and water quality-based effluent limits are not required at this time (UAC R317-8-4.2(4)a.2.). In addition to the monitoring requirements from the previous permit, new monitoring requirements for effluent free cyanide, ammonia, pH, and effluent temperature are required to support future reasonable potential determinations. Chronic WET monitoring as an indicator is a new requirement in addition to the previous acute WET monitoring.

Receiving Waters and Designated Uses (UAC R317-2-13.11):

Class 2B, 3E Unnamed drainage Ditch

Transitional Waters, Great Salt Lake

Class 5E protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain

Farmington Bay, Great Salt Lake

Class 5D protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain

Level I Antidegradation Review

The Division of Water Quality (DWQ), compiled and analyzed the discharge monitoring report (DMR) data for the effluent from 2010-2015. The purposes of these analyses were twofold: 1) to document that the effluent will not violate water quality standards, and 2) determine if water quality-based effluents are required for the permit. Water quality-based effluents are required when the effluent has “reasonable potential” to cause or contribute to a violation of a water quality standard.

The Level I antidegradation review requirements are that existing uses will be protected (UAC R317-2-3.1). For the affected receiving waters, existing uses are the same as the designated uses. The receiving waters for this effluent do not have numeric water quality criteria for the protection of aquatic life and therefore, the relevant portions of R317-8-4.2(4)(a)6 that apply are:

R317-8-4.2(4)(a)6. Where the State has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard the Director will establish effluent limits using one or more of the following options:

- a. Establish effluent limits using a calculated numeric water quality criterion for the pollutant which the Director determines will attain and maintain applicable narrative water quality criteria and will fully protect the designated use. Such a criterion may be derived using a proposed State criterion, or an explicit State policy or rule interpreting its narrative water quality criteria supplemented with other relevant information which may include: EPA's Water Quality Standards Handbook, October 1983, risk assessment data, exposure data, information about the pollutant from the Food and Drug Administration, and current EPA criteria documents:
- b. Establish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under section 307(a) of the CWA, supplemented where necessary by other relevant information;

The screening approach described in the *Interim Methods for Evaluating Use Support for Great Salt Lake, Utah, Pollution Discharge Elimination System (UPDES) Permits* (DWQ, 2016) was used to evaluate the pollutant concentrations in the effluent.

Maximum effluent concentrations were estimated and compared to Class 3D fresh water numeric criteria screening concentrations at 400 mg/L CaCO₃ hardness (UAC R317-2-14). The maximum effluent concentrations were estimated in accordance with DWQ's (2016) reasonable potential procedures. Effluent concentrations are reported as total recoverable and when applicable, were converted to dissolved concentrations using the conversion factors in R317-2-14 for comparisons to dissolved numeric criteria. For pollutants that the maximum effluent concentration exceeded the fresh water screening criteria, the effluent concentrations were also compared to Farmington Bay receiving water concentrations as determined by DWQ monitoring results from 2011-2012. The outcomes of the comparisons are shown in the following Table.

Pollutant	Maximum Predicted Effluent Concentration, dissolved (mg/L)	Maximum Effluent Concentration Less than Screening Criteria	Maximum Effluent Concentration Exceeds Screening Criteria	Maximum Effluent Concentrations Exceed Receiving Water Concentrations
Arsenic	0.88	Yes		
Cadmium	0.0054	Yes		
Chromium	0.0056	Yes		
Copper	0.22	Yes		
Cyanide (Total)	0.12		Yes	Unknown
Lead	0.0025	Yes		
Mercury	0.0005		Yes	Yes
Nickel	0.03	Yes		
Selenium	0.0032	Yes		
Silver	0.0094	Yes		
Zinc	0.011	Yes		

The maximum predicted effluent concentrations of mercury were greater than the screening criteria and existing concentrations in Farmington Bay. The maximum predicted effluent concentration of cyanide also exceeded the screening criteria but no data for cyanide concentrations in Farmington Bay were available for comparison. Aquatic life is anticipated to be the most sensitive use to arsenic, copper and cyanide whereas birds are anticipated to be the most sensitive use to mercury. The pollutants that exceed the fresh water screening values are further discussed below.

Cyanide. The maximum predicted effluent concentration of cyanide was 0.12 mg/L, the maximum detected concentration was 0.055 mg/L, and the fresh water screening concentration is 0.0052 mg/L. The analytical method used to measure effluent concentrations of cyanide was for total cyanide but the aquatic life screening criteria are for free cyanide. Free cyanide is a subset of total cyanide and in most situations, total cyanide will overestimate the free cyanide concentrations. Monitoring for free cyanide is a new requirement for the upcoming permit cycle to support future comparisons and reasonable potential evaluations.

Mercury. The maximum predicted effluent concentration of mercury was 0.0012 mg/L, the maximum detected concentration was 0.00016 mg/L, and the fresh water screening concentration is 0.000012 mg/L. The effluent concentrations were variable and below the detection limit for 30% of the effluent samples. The fresh water screening value is based on preventing fish from accumulating mercury to concentrations injurious of humans which is not directly applicable to Farmington Bay.

DWQ continues to closely monitor water quality for mercury concentrations in Great Salt Lake including Farmington Bay. The data for Farmington Bay and the Transitional Waters are currently insufficient to assess if mercury concentrations are impairing or supporting the designated uses as documented in the 2010 and 2012 *Integrated Reports*. To support the future assessments,

continued monitoring of mercury effluent concentrations with a sufficiently sensitive analytical method capable of detecting concentrations at the fresh water criteria concentration (0.000012 mg/L) is required. Additional evaluations and reductions of the potential sources of mercury under the pre-treatment program are recommended for consideration but are not required at this time.

Ammonia. Insufficient data for ammonia effluent concentrations were available and ammonia monitoring of the effluent is a new requirement to provide the data to assess ammonia including pH and temperature. Until this data can be collected and assessed, the results of chronic WET monitoring will be used to demonstrate that the effluent, including ammonia, will not harm the designated uses. Ammonia monitoring is a new requirement for this permit cycle.

Level II Antidegradation Review

In accordance with UAC R317-2-3.5.b.1.(b), a Level II antidegradation review is not required because there is no change to effluent concentrations or loading compared to the previous permit.

WET (Whole Effluent Toxicity) Testing

NDSO currently conducts acute WET monitoring consistent with Utah's 1991 WET Implementation Guidance. Chronic WET monitoring as an indicator is a new requirement in addition to acute WET monitoring because the dilution in the Class 5E Transitional Waters is less than 20:1. Interpretation of the chronic WET monitoring will be in accordance with the Interim Methods for Evaluating Use Support for Great Salt Lake, Utah, Pollution Discharge Elimination System (UPDES) Permits (DWQ, 2016). In addition, the chronic WET monitoring results are anticipated to increase the confidence that pollutants exceeding the fresh water screening criteria will not harm the uses.