North Dakota Department of Environmental Quality Public Notice
Reissue of an NDPDES Permit

Public Notice Date: 2/22/2023 Public Notice Number: ND-2023-006

Purpose of Public Notice

The Department intends to reissue the following North Dakota Pollutant Discharge Elimination System (NDPDES) Discharge Permit under the authority of Section 61-28-04 of the North Dakota Century Code.

Permit Information

Application Date: 10/5/2022 Application Number: ND0022349

Applicant Name: Williston City Of

Mailing Address: PO Box 2437, Williston, ND 58802-2437

Telephone Number:

Proposed Permit Expiration Date: 3/31/2028

Facility Description

The reapplication is for a water resource recovery facility that services the City of Williston. The facility is located in the SE1/4 SE1/4 Section 24 and NE1/4 NE1/4 Section 25, Township 154N, Range 101W. Any discharge from the facility would be to the secondary channel of the Missouri River south of the facility.

Tentative Determinations

Proposed effluent limitations and other permit conditions have been made by the Department. They assure that State Water Quality Standards and applicable provisions of the FWPCAA will be protected.

Information Requests and Public Comments

Copies of the application, draft permit, and related documents are available for review. For further information on making public comments/public comment tips please visit: https://deq.nd.gov/PublicCommentTips.aspx. Comments or requests should be directed to the ND Dept of Env Quality, Div of Water Quality, 4201 Normandy Street, Bismarck ND 58503-1324 or by calling 701.328.5210.

All comments received by March 23, 2023 will be considered prior to finalizing the permit. If there is significant interest, a public hearing will be scheduled. Otherwise, the Department will issue the final permit within sixty (60) days of this notice.

The NDDEQ will consider every request for reasonable accommodation to provide an accessible meeting facility or other accommodation for people with disabilities, language interpretation for people with limited English proficiency (LEP), and translations of written material necessary to access programs and information. To request accommodations, contact the NDDEQ Non-discrimination Coordinator at 701-328-5210 or deqEJ@nd.gov. TTY users may use Relay North Dakota at 711 or 1-800-366-6888.

DRAFT

Permit No: ND0022349
Effective Date: April 1, 2023
Expiration Date: March 31, 2028

AUTHORIZATION TO DISCHARGE UNDER THE

NORTH DAKOTA POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with Chapter 33.1-16-01 of the North Dakota Department of Environmental Quality rules as promulgated under Chapter 61-28 (North Dakota Water Pollution Control Act) of the North Dakota Century Code,

the City of Williston

is authorized to discharge from its Water Resource Recovery Facility

to the Missouri River and headwaters of Lake Sakakawea

provided all the conditions of this permit are met.

This permit and the authorization to discharge shall expire at midnight,

March 31, 2028.

Signed this _____ day of _____, _____.

_____
Karl H. Rockeman, P.E.
Director
Division of Water Quality

BP 2019.05.29

TABLE OF CONTENTS

DEFINITIONS Standard Permit BP 2019.05.29

1. "**Act**" means the Clean Water Act.

2. "**Average monthly discharge limitation**" means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

3. "**Average weekly discharge limitation**" means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

4. "**Best management practices**" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage areas.

5. "**Bypass**" means the intentional diversion of waste streams from any portion of a treatment facility.

6. "**Composite**" sample means a combination of at least 4 discrete sample aliquots, collected over periodic intervals from the same location, during the operating hours of a facility not to exceed a 24-hour period. The sample aliquots must be collected and stored in accordance with procedures prescribed in the most recent edition of Standard Methods for the Examination of Water and Wastewater.

7. "**Daily discharge**" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

8. "**Department**" means the North Dakota Department of Environmental Quality, Division of Water Quality.

9. "**DMR**" means discharge monitoring report.

10. "**EPA**" means the United States Environmental Protection Agency.

11. "**Geometric mean**" means the n^{th} root of a product of n factors, or the antilogarithm of the arithmetic mean of the logarithms of the individual sample values.

12. "**Grab**" for monitoring requirements, means a single "dip and take" sample collected at a representative point in the discharge stream.

13. "**Instantaneous**" for monitoring requirements, means a single reading, observation, or measurement. If more than one sample is taken during any calendar day, each result obtained shall be considered.

14. "**Maximum daily discharge limitation**" means the highest allowable "daily discharge."

15. "**Salmonid**" means of, belonging to, or characteristic of the family Salmonidae, which includes the salmon, trout, and whitefish.

16. "**Sanitary Sewer Overflows (SSO)**" means untreated or partially treated sewage overflows from a sanitary sewer collection system.

17. "**Severe property damage**" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

18. "**Total drain**" means the total volume of effluent discharged.

19. "**Upset**" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

DEFINITIONS Whole Effluent Toxicity (WET) BP 2017.04.06

1. "**Acute toxic unit**" ("TUa") is a measure of acute toxicity. TUa is the reciprocal of the effluent concentration that causes 50 percent of the organisms to die by the end of the acute exposure period (i.e., 100/"LC50").

2. "**Chronic toxic unit**" ("TUc") is a measure of chronic toxicity. TUc is the reciprocal of the effluent concentration that causes no observable effect on the test organisms by the end of the chronic exposure period (i.e., 100/"IC25").

3. "**Inhibition concentration**", ("IC"), is a point estimate of the toxicant concentration that causes a given percent reduction (p) in a non-quantal biological measurement (e.g., reproduction or growth) calculated from a continuous model (e.g., Interpolation Method).

4. "**LC50**" means the concentration of toxicant (e.g., effluent) which is lethal to 50 percent of the organisms exposed in the time period prescribed by the test.

5. "**No observed effect concentration**", ("NOEC"), is the highest concentration of toxicant (e.g., effluent) to which organisms are exposed in a chronic toxicity test [full life-cycle or partial life-cycle (short term) test], that causes no observable adverse effects on the test organisms (i.e., the highest concentration of effluent in which the values for the observed responses are not statistically significantly different from the controls).

OUTFALL DESCRIPTION

Outfall 002. Active. Final.			
Latitude: 48.1366	Longitude: -103.6055	County: Williams	
Township: 154N	Range: 101W	Section: 25	QQ: AAD
Receiving Stream: Secondary Channel of the Missouri River		Classification: Class I	
Outfall Description: Treated effluent flows as a continuous discharge from the Water Resource Recovery Facility. The outfall is located near the U.S. Army Corps of Engineers (USACE) Sand Creek Pumping Station. Discharges are to a secondary channel of the Missouri River.			

Outfall 003. Active. Internal.			
Latitude: 48.1421	Longitude: -103.6082	County: Williams	
Township: 154N	Range: 101W	Section: 24	QQ: DDB
Receiving Stream: Sand Creek Holding Area		Classification: Class III, Wetland	
Outfall Description: This is an interior point that is a sampling site for influent entering the Water Resource Recovery Facility.			

PERMIT SUBMITTALS SUMMARY

Coverage Point	Submittal	Monitoring Period	Submittal Frequency	First Submittal Date
002A	Discharge Monitoring Report	1/month	1/month	May 31, 2023
003A	Discharge Monitoring Report	1/month	1/month	May 31, 2023
002W	Discharge Monitoring Report	1/quarter	1/quarter	July 31, 2023
002Q	Discharge Monitoring Report	1/year	1/year	April 30, 2024
003Q	Discharge Monitoring Report	1/year	1/year	April 30, 2024
Application Renewal	EPA Form 2A	Not applicable	1/permit cycle	September 30, 2027

SPECIAL CONDITIONS

No special conditions have been determined at this time.

I. LIMITATIONS AND MONITORING REQUIREMENTS

A. Discharge Authorization

1. During the effective period of this permit, the permittee is authorized to discharge pollutants from the outfalls as specified to the following: **Secondary channel of the Missouri River**.

2. This permit authorizes the discharge of only those pollutants resulting from facility processes, waste streams, and operations clearly identified in the permit application process.

B. Influent Monitoring

1. The permittee must monitor influent as specified below:

Influent Monitoring Requirements **Outfall 003**		
Parameter	Monitoring Requirements	
	Sample Frequency	Sample Type
Biochemical Oxygen Demand (BOD_5)	1/week	Composite
Total Suspended Solids (TSS)	1/week	Composite
pH	1/week	Instantaneous
Ammonia as N	1/week	Composite
Trace Elements (40 CFR 122 Appendix D, Table III)[a]	1/year	Composite
[a] Refer to Part V(F) for the list of parameters that must be analyzed as part the trace elements sample.		

C. Effluent Limitations and Monitoring

1. The permittee must limit and monitor all discharges as specified below:

Effluent Limitations and Monitoring Requirements **Outfall 002**					
Parameter	Effluent Limitations			Monitoring Requirements	
	30 Consecutive Day Average	7 Consecutive Day Average	Daily Maximum	Sample Frequency	Sample Type
Biochemical Oxygen Demand (BOD_5)	25 mg/L	45 mg/L	N/A	3/week	Composite
BOD_5 (Removal Efficiency)	Shall not be less than 85%	N/A	N/A	1/month	Calculated
Total Suspended Solids (TSS)	30 mg/L	45 mg/L	N/A	3/week	Composite
TSS (Removal Efficiency)	Shall not be less than 85%	N/A	N/A	1/month	Calculated
pH [a]	Between 6.5 and 9.0 S.U.			1/day [h]	Instantaneous
Total Residual Chlorine [b]	N/A	N/A	0.10 mg/L	1/day	Grab
Oil & Grease – Visual [c]	N/A	N/A	N/A	1/day [h]	Visual
Oil & Grease [c]	N/A	N/A	10 mg/L	Conditional	Grab
E. Coli [d]	126/100mL	N/A	409/100mL	3/week	Grab
Temperature (°C)	N/A	N/A	*	1/day [h]	Grab
Ammonia as N [e]	Refer to the Ammonia Effluent Limitations table below			3/week	Composite
Nitrogen, Total [f]	Average for the month (mg/L)	N/A	Monitor only (mg/L)	1/month	Composite
Nitrogen, Total [f]	Average for the month (lb/day)	N/A	Monitor only (lb/day)	1/month	Calculated
Phosphorus, Total (as P)	Average for the month (mg/L)	N/A	Monitor only (mg/L)	1/month	Composite
Phosphorus, Total (as P)	Average for the month (lb/day)	N/A	Monitor only (lb/day)	1/month	Calculated
Whole Effluent Toxicity (WET)	Refer to WET requirements in Part I(E)			1/quarter	Grab
Trace Elements (40 CFR 122, Appendix D, Table III) [g]	Refer to Part V(F)			1/year	Composite
Flow Effluent (MGD)	N/A	N/A	N/A	1/day	Instantaneous
Drain Total (MG)	N/A	N/A	N/A	1/month	Calculated

Effluent Limitations and Monitoring Requirements **Outfall 002**	
Notes:	
a.	The pH, an instantaneous limitation, shall be between 6.5 and 9.0 s.u.
b.	Testing required only during periods when effluent is chlorinated.
c.	There shall be no floating oil or visible sheen present in the discharge. If floating oil or a visible sheen is detected in the discharge, the department shall be contacted and a grab sample analyzed to ensure compliance with the concentration limitation. Any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of the permit.
d.	The limit for *E. coli* shall apply only during the recreational season, April 1 to October 31. Monitoring for *E. coli* shall be in effect only during the recreational season. Averages for *E. coli* shall be determined as a geometric mean.
e.	The permittee will use Missouri River parameters to calculate the real-time water quality standard for ammonia (refer to the Ammonia Effluent Limitations table for Outfall 002). This calculated limit will be compared to facility effluent data for ammonia. If the effluent value is greater than the calculated limit, the permittee will report a violation.
f.	Total nitrogen is a combination of nitrate, nitrite, and Total Kjeldahl Nitrogen (TKN).
g.	A total hardness of the receiving stream needs to be determined every time metals are sampled and analyzed. The hardness is used to calculate parameter criteria according to the state water quality standards. This sample shall be collected upstream of the final discharge site.
h.	Sampling once per day applies during normal daily operations when the facility is staffed. Typically, a work week runs Monday through Friday.
*.	The thermal mixing zone shall not present a thermal shock or stressor, affect spawning, or block the migration of aquatic organisms.
N/A	Not Applicable
Stipulations:	
The permittee must not discharge any floating solids, visible foam in other than trace amounts, or oily wastes that produce sheen on the surface of the receiving water. The discharge must be free from materials that produce a color, odor or other condition to such a degree as to create a nuisance.	
All effluent parameters shall be sampled at a point leaving outfall 002 but prior to leaving plant property or entering waters of the state.	
The dates of discharge, frequency of analysis, and number of exceedences shall be included on the Discharge Monitoring Report (DMR).	

Ammonia Effluent Limitations **– Outfall 002 – Water Resource Recovery Facility**

Average Monthly Limitation (AML)

The 30-day average concentration of total ammonia (expressed as N in mg/L) does not exceed the numerical value given by the following formula:

$$AML = 0.8876 \times \left(\frac{0.0278}{1 + 10^{7.688-pH}} + \frac{1.1994}{1 + 10^{pH-7.688}}\right) \times \left(2.126 \times 10^{0.028\times(20-MAX(T,7))}\right)$$

Receiving stream pH and temperature in degrees Celsius are used for the calculation (Refer to Part I(D)(1))

Maximum Daily Limitation (MDL)

The concentration of total ammonia (expressed as N in mg/L) does not exceed the numerical value given by the following formula:

$$MDL = MINIMUM\left(\frac{0.275}{1 + 10^{7.204-pH}} + \frac{39.0}{1 + 10^{pH-7.204}}\right),$$
$$\left(0.7249 \times \left(\frac{0.0114}{1 + 10^{7.204-pH}} + \frac{1.6181}{1 + 10^{pH-7.204}}\right) \times \left(23.12 \times 10^{0.036\times(20-T)}\right)\right)$$

Receiving stream pH and temperature in degrees Celsius are used for the calculation (Refer to Part I(D)(1))

For the MDL calculation, permittee receives ten percent of the stream flow for dilution at the time of discharge based on the flow of the secondary channel of the Missouri River. If the upstream flow is not available or collected, then the 1B3 critical low flow of 0 cfs shall be used. MDL concentration will be calculated on a mass balance basis using the following formula. The permittee is responsible for units matching in the equation.

MDL Ammonia Effluent Limitation = $(Q_u * C_u + Q_e * C_e)/(Q_u + Q_e)$ where
Q_u = 10% of the secondary channel of the Missouri River flow parameter (if upstream flow is not available or collected, then the 1B3 critical low flow of 0 cfs shall be used)
C_u = Missouri River ammonia parameter
Q_e = Effluent flow parameter
C_e = Ammonia as N parameter

Notes:

Calculation of the AML must be performed for the calendar month. If an exceedance is detected for the calendar month, the exceedance must be reported on the DMR.

Calculation of the MDL must be performed for each discharge sample. If an exceedance is detected on any single sample, the exceedance must be reported on the DMR.

D. Ambient Monitoring

1. Ambient monitoring of the Missouri River shall be conducted as described below.

In-Stream, Self-Monitoring Requirements			
Parameter	Monitoring Requirements		
	Sample Point	Measurement Frequency	Sample Type
pH (s.u) [a]	Upstream (prior to mixing with effluent)	3/week	Instantaneous
Temperature (ºC) [a]	Upstream (prior to mixing with effluent)	3/week	Instantaneous
Stream Flow (cfs) [a,b]	Upstream (prior to mixing with effluent)	3/week	Instantaneous
a. Sample must be collected/recorded the same day as the ammonia sample for Outfall 002.			
b. Upstream flow must represent flow in the secondary channel of the Missouri River. If upstream flow of the secondary channel of the Missouri River is not available or collected, then the 1B3 critical low flow of 0 cfs shall be reported.			

E. Whole Effluent Toxicity (WET) Requirements BP 2021.01.26

1. Acute Toxicity Testing

Acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *"Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms,"* EPA-821-R-02-012 (Fifth Ed., October 2002). The permittee shall conduct an acute 48-hour static renewal toxicity test using freshwater fleas, *Ceriodaphnia dubia* and an acute 96-hour static renewal toxicity test using fathead minnows, *Pimephales promelas*.

Outfall 002
WET tests shall be performed at least once per calendar quarter on both species. This requirement may be reduced to alternating species upon the permittee requesting a reduction to toxicity testing–refer to the "**Reduced Monitoring for Toxicity Testing**" section below.

Toxicity is defined as:

Acute test failure is defined as lethality to 50% or more of the test organisms exposed to 100% effluent or >1.0 TUa for *Ceriodaphnia dubia* 48-hour and fathead minnow 96-hour test. The 48-hour and 96-hour effluent value must be <**1.0 TUa** to indicate a passing test. Any 48-hour or 96-hour effluent value of >**1.0 TUa** will constitute a failure. Tests in which the control survival is less than 90% are invalid and must be repeated.

Acute WET requirements for **Outfall 002**						
Implementation	Monitoring Imposed or Limitation Imposed					
Effluent Dilution	0%(Control)	12.5%	25%	50%	75%	100%
Dilution Water	**Secondary Channel of the Missouri River**					
Species and Test Type	*Ceriodaphnia dubia* - 48-Hour Acute - Static Renewal - 20°C					
	Fathead minnow - 96-Hour Acute - Static Renewal - 20°C					
Endpoint	TUa					
Compliance Point	**End-of-pipe**					

If acute toxicity occurs in a routine test, an additional test shall be initiated within 14 days from the date of the initial toxicity findings. Should there be no discharge during a specified sampling time frame; sampling shall be performed as soon as there is a discharge. Should toxicity occur in the second test, testing shall be conducted at a frequency of once a month and the implementation of a 5.Toxicity Reduction Evaluation (TRE) shall be determined by the department. If no toxicity is found in the second test, testing shall occur as outlined in the permit.

The permittee shall report the following results of each toxicity test on the DMR for that reporting period:

***Pimephales promelas* (Fathead Minnow)**
Report the highest TUa for Fathead minnow, Parameter No. TSN6C.

***Ceriodaphnia dubia* (Water Flea)**
Report the highest TUa for *Ceriodaphnia dubia*, Parameter No. TSM3B.

2. Chronic Toxicity Testing

No chronic toxicity limits are imposed on this permit. Therefore, the permittee is not required to monitor or test for chronic toxicity.

The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of "*Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms,*" EPA-821-R-02-013 (Fourth Ed., October 2002). Test species shall consist of freshwater fleas, *Ceriodaphnia dubia* and fathead minnows, *Pimephales promelas*.

3. Reduced Monitoring For Toxicity Testing

a. Alternating Species
If the results of a minimum of four consecutive samples taken over at least a 12 month period indicate no toxicity, the permittee may request a test reduction from the department. This reduction would only be testing one species per sampling frequency. If fathead minnows are used first then the next test would be *C. dubia* or vice versa and continue alternating. The department may approve or deny the request, based on the biomonitoring results and other available information. If the request is approved, the test procedures are to be the same as outlined in 1. Acute Toxicity Testing and/or 2. Chronic Toxicity Testing.

This provision is revoked at the time of permit reissuance/renewal. Permittees may request alternating species after the conditions of this section are met under the reissued permit.

If toxicity occurs in any single species test, the provision for alternating species shall be immediately revoked and 1. Acute Toxicity Testing and/or 2. Chronic Toxicity Testing shall be followed in whole.

b. Monthly Testing
If the results of 5. Toxicity Reduction Evaluation (TRE) have been accepted by the department or a period of time has indicated no toxicity, the permittee may request the department to allow a reduction from monthly to quarterly toxicity testing for both species. The department may approve or deny the request, based on the bio-monitoring results and other available information. If the request is approved, the test procedures are to be the same as outlined in 1. Acute Toxicity Testing and/or 2. Chronic Toxicity Testing.

4. Reporting Requirements
Test results shall be submitted with the Discharge Monitoring Report (DMR) form for each reporting period. The format for the report shall be consistent with the above reference manual(s) as outlined in the section "Report Preparation and Test Review." Each lab generated report shall document the findings for each species reference toxicity testing chart.

5. Toxicity Reduction Evaluation (TRE)
If toxicity is detected, and it is determined by the department that a TRE is necessary, the permittee shall be so notified and shall initiate a TRE immediately thereafter. A TRE shall reference the latest revision of "*Technical Support Document For Water Quality-based Toxics Control,*" EPA/505/2-90-001 – PB91-127415 (March 1991). The purpose of the TRE will be to establish the cause of the toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity.

If the TRE establishes that the toxicity cannot be eliminated by the current treatment system, the permittee shall submit a proposed compliance plan to the department. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the department, this permit may be reopened and modified.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations or proper discharge management as approved by the department, the permittee may:

a) Submit an alternative control program for compliance with the numerical requirements; or

b) If necessary, provide a modified biomonitoring protocol which compensates for the pollutant(s) being controlled numerically.

If acceptable to the department, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the department, and/or a modified biomonitoring protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the department, shall in no way relieve the permittee from maintaining compliance with the whole effluent toxicity requirements of this permit.

II. MONITORING, RECORDING, AND REPORTING REQUIREMENTS BP 2021.09.09

A. Representative Sampling (Routine and Non-Routine Discharges)

All samples and measurements taken shall be representative of the monitored discharge.

In order to ensure that the effluent limits set forth in this permit are not violated at times other than when routine samples are taken, the permittee must collect additional samples at the appropriate outfall whenever any discharge occurs that may reasonably be expected to cause or contribute to a violation that is unlikely to be detected by a routine sample. The permittee must analyze the additional samples for those parameters limited under **Part I Effluent Limitations and Monitoring** requirements of this permit that are likely to be affected by the discharge.

The permittee must collect such additional samples as soon as the spill, discharge, or bypassed effluent reaches the outfall. The samples must be analyzed in accordance with B. Test Procedures. The permittee must report all additional monitoring in accordance with D. Additional Monitoring.

B. Test Procedures

The collection and transportation of all samples shall conform with EPA preservation techniques and holding times found in 40 CFR 136. All laboratory tests shall be performed by a North Dakota certified laboratory in conformance with test procedures pursuant to 40 CFR 136, unless other test procedures have been specified in this permit or approved by EPA as an alternate test procedure under 40 CFR 136.5. The method of determining the total amount of water discharged shall provide results within 10 percent of the actual amount.

C. Recording of Results

Records of monitoring information shall include:

1. the date, exact place and time of sampling or measurements;
2. the name(s) of the individual(s) who performed the sampling or measurements;
3. the name of the laboratory;
4. the date(s) and time(s) analyses were performed;
5. the name(s) of the individual(s) who performed the analyses;
6. the analytical techniques or methods used; and
7. the results of such analyses.

D. Additional Monitoring

If the discharge is monitored more frequently than this permit requires, all additional results, if in compliance with B. Test Procedures, shall be included in the summary on the Discharge Monitoring Report.

E. Reporting of Monitoring Results

1. Monitoring results shall be summarized and reported to the department using Discharge Monitoring Reports (DMRs). If no discharge occurs during a reporting period, "No Discharge" shall be reported. The permittee must submit DMRs electronically using the electronic information reporting system unless requirements in subsection 3 are met.

2. Prior to December 21, 2025, the permittee may elect to electronically submit the following

compliance monitoring data and reports instead of mailing paper forms. Beginning December 21, 2025, the permittee must report the following using the electronic reporting system:

a. General permit reports [e.g., notices of intent (NOI); notices of termination (NOT); no exposure certifications (NOE)];

b. Municipal separate storm sewer system program reports;

c. Pretreatment program reports;

d. Sewer overflow/bypass event reports; and

e. Clean Water Act 316(b) annual reports

3. The permittee may seek a waiver from electronic reporting. To obtain a waiver, the permittee must complete and submit an Application for Temporary Electronic Reporting Waiver form (SFN 60992) to the department. The department will have 120 days to approve or deny the waiver request. Once the waiver is approved, the permittee may submit paper versions of monitoring data and reports to the department.

   a. One of the following criteria must be met in order to obtain a waiver. The department reserves the right to deny any waiver request, even if they meet one of the criteria below.

      1. No internet access,

      2. No computer access,

      3. Annual DMRs (upon approval of the department),

      4. Employee turnover (3-month periods only), or

      5. Short duration permits (upon approval of the department)

   All reports must be postmarked by the last day of the month following the end of each reporting period. All original documents and reports required herein shall be signed and submitted to the department at the following address:

   ND Department of Environmental Quality
   Division of Water Quality
   4201 Normandy Street
   Bismarck ND 58503-1324

F. Records Retention

All records and information (including calibration and maintenance) required by this permit shall be kept for at least three years or longer if requested by the department or EPA.

III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

B. Proper Operation and Maintenance

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. If necessary to achieve compliance with the conditions of this permit, this shall include the operation and maintenance of backup or auxiliary systems.

C. Planned Changes

The department shall be given advance notice of any planned changes at the permitted facility or of an activity which may result in permit noncompliance. Any anticipated facility expansions, production increase, or process modifications which might result in new, different, or increased discharges of pollutants shall be reported to the department as soon as possible. Changes which may result in a facility being designated a "new source" as determined in 40 CFR 122.29(b) shall also be reported.

D. Duty to Provide Information

The permittee shall furnish to the department, within a reasonable time, any information which the department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the department, upon request, copies of records required to be kept by this permit. When a permittee becomes aware that it failed to submit any relevant facts or submitted incorrect information in a permit application or any report, it shall promptly submit such facts or information.

E. Signatory Requirements

All applications, reports, or information submitted to the department shall be signed and certified.

All permit applications shall be signed by a responsible corporate officer, a general partner, or a principal executive officer or ranking elected official.

All reports required by the permit and other information requested by the department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

The authorization is made in writing by a person described above and submitted to the department; and

The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

If an authorization under E. Signatory Requirements is no longer accurate for any reason, a new authorization satisfying the above requirements must be submitted to the department prior to or together with any reports, information, or applications to be signed by an authorized representative.

Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

F. Twenty-four Hour Notice of Noncompliance Reporting

1. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The following occurrences of noncompliance shall be included in the oral report to the department at 701.328.5210:

    a. Any lagoon cell overflow or any unanticipated bypass which exceeds any effluent limitation in the permit under G. Bypass of Treatment Facilities;

    b. Any upset which exceeds any effluent limitation in the permit under H. Upset Conditions; or

    c. Violation of any daily maximum effluent or instantaneous discharge limitation for any of the pollutants listed in the permit.

2. A written submission shall also be provided within five days of the time that the permittee became aware of the circumstances. The written submission shall contain:

    a. A description of the noncompliance and its cause;

    b. The period of noncompliance, including exact dates and times;

    c. The estimated time noncompliance is expected to continue if it has not been corrected; and

    d. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

Reports shall be submitted to the address in **Part II.E. Reporting of Monitoring Results**. The department may waive the written report on a case by case basis if the oral report has been received within 24 hours by the department at 701.328.5210 as identified above.

All other instances of noncompliance shall be reported no later than at the time of the next Discharge Monitoring Report submittal. The report shall include the four items listed in this subsection.

G. Bypass of Treatment Facilities

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to any of the following provisions in this section.

2. Bypass exceeding limitations-notification requirements.

    a. Anticipated Bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of bypass.

    b. Unanticipated Bypass. The permittee shall submit notice of an unanticipated bypass as required under F. Twenty-four Hour Notice of Noncompliance Reporting.

3. Prohibition of Bypass. Bypass is prohibited, and the department may take enforcement action against a permittee for bypass, unless:

    a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. The permittee submitted notices as required under the 1. Anticipated Bypass subsection of this section.

The department may approve an anticipated bypass, after considering its adverse effects, if the department determines that it will meet the three (3) conditions listed above.

H. Upset Conditions

An upset constitutes an affirmative defense to an action brought for noncompliance with technology-based permit effluent limitations if the requirements of the following paragraph are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and the permittee can identify its cause(s);

2. The permitted facility was, at the time being, properly operated;

3. The permittee submitted notice of the upset as required under F. Twenty-four Hour Notice of Noncompliance Reporting and

4. The permittee complied with any remedial measures required under I. Duty to Mitigate.

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. The permittee, at the department's request, shall provide accelerated or additional monitoring as necessary to determine the nature and impact of any discharge.

J. Removed Materials

Collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not be directly blended with or enter either the final plant discharge and/or waters of the state. The permit issuing authority shall be contacted prior to the disposal of any sewage sludges. At that time, concentration limitations and/or self-monitoring requirements may be established.

K. Duty to Reapply

Any request to have this permit renewed should be made six months prior to its expiration date.

IV. GENERAL PROVISIONS

A. Inspection and Entry

The permittee shall allow department and EPA representatives, at reasonable times and upon the presentation of credentials if requested, to enter the permittee's premises to inspect the wastewater treatment facilities and monitoring equipment, to sample any discharges, and to have access to and copy any records required to be kept by this permit.

B. Availability of Reports

Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the department and EPA. As required by the Act, permit applications, permits, and effluent data shall not be considered confidential.

C. Transfers

This permit is not transferable except upon the filing of a Statement of Acceptance by the new party and subsequent department approval. The current permit holder should inform the new controller, operator, or owner of the existence of this permit and also notify the department of the possible change.

D. New Limitations or Prohibitions

The permittee shall comply with any effluent standards or prohibitions established under Section 306(a), Section 307(a), or Section 405 of the Act for any pollutant (toxic or conventional) present in the discharge or removed substances within the time identified in the regulations even if the permit has not yet been modified to incorporate the requirements.

E. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. This includes the establishment of limitations or prohibitions based on changes to Water Quality Standards, the development and approval of waste load allocation plans, the development or revision to water quality management plans, changes in sewage sludge practices, or the establishment of prohibitions or more stringent limitations for toxic or conventional pollutants and/or sewage sludges. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

F. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

G. State Laws

Nothing in this permit shall be construed to preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation preserved under Section 510 of the Act.

H. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

J. Severability
The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

V. INDUSTRIAL WASTE MANAGEMENT BP 2021.09.28
Major POTWs - Non-Approved Pretreatment Program Requirements

A. General Responsibilities
The permittee has the responsibility to protect the Publicly Owned Treatment Works (POTW) from pollutants which would inhibit, interfere, or otherwise be incompatible with operation of the treatment works including interference with the use or disposal of municipal sludge.

B. Pollutant Restrictions
Pretreatment Standards (40 CFR Section 403.5) developed pursuant to Section 307 of the Federal Clean Water Act (the Act) require that the permittee shall not allow, under any circumstances, the introduction of the following pollutants to the POTW from any source of nondomestic discharge:

1. Any other pollutant which may cause Pass Through or Interference;

2. Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, waste streams with a closed cup flashpoint of less than sixty (60) degrees Centigrade (140 degrees Fahrenheit) using the test methods specified in 40 CFR Section 261.21;

3. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with a pH of lower than 5.0 s.u., unless the treatment facilities are specifically designed to accommodate such discharges;

4. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW, or other interference with the operation of the POTW;

5. Any pollutant, including oxygen demanding pollutants (e.g., BOD), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with any treatment process at the POTW;

6. Heat in amounts which will inhibit biological activity in the POTW resulting in Interference, but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds forty (40) degrees Centigrade (104 degrees Fahrenheit) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits;

7. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause Interference or Pass Through at the POTW;

8. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;

9. Any trucked or hauled pollutants, except at discharge points designated by the POTW; and

10. Any specific pollutant which exceeds a local limitation established by the permittee in accordance with the requirements of 40 CFR Section 403.5 (c) and (d).

C. Approval Authority
North Dakota was delegated the Industrial Pretreatment Program in September of 2005. The

North Dakota Department of Environmental Quality, Division of Water Quality shall be the Approval Authority and the mailing address for all reporting and notifications to the Approval Authority shall be:

ND Department of Environmental Quality
Division of Water Quality
4201 Normandy Street
Bismarck ND 58503-1324

D. Industrial Categories

In addition to the general limitations expressed above, more specific Pretreatment Standards have been and will be promulgated for specific industrial categories under Section 307 of the Act (40 CFR Part 405 et. Seq.).

E. Notification Requirements

The permittee must notify the Approval Authority, of any new introductions by new or existing industrial users or any substantial change in pollutants from any industrial user within sixty (60) days following the introduction or change. Such notice must identify:

1. Any new introduction of pollutants into the POTW from an industrial user which would be subject to Sections, 301, 306, and 307 of the Act if it were directly discharging those pollutants; or

2. Any substantial change in the volume or character of pollutants being introduced into the POTW by any industrial user;

3. For the purposes of this section, adequate notice shall include information on:

   a. The identity of the industrial user;

   b. The nature and concentration of pollutants in the discharge and the average and maximum flow of the discharge to be introduced into the POTW; and

   c. Any anticipated impact of the change on the quantity or quality of effluent to be discharged from or biosolids produced at such POTW.

4. For the purposes of this section, a significant industrial user shall include:

   a. Any discharger subject to Categorical Pretreatment Standards under Section 307 of the Act and 40 CFR chapter I, subchapter N;

   b. Any discharger which has a process wastewater flow of 25,000 gallons or more per day;

   c. Any discharger contributing five percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant;

   d. Any discharger who is designated by the Approval Authority as having a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standards or requirements.

F. Sampling and Reporting Requirements

The permittee shall sample and analyze the effluent for the following pollutants:

40 CFR 122 Appendix D, Table III				
Antimony, Total	Arsenic, Total	Beryllium, Total	Cadmium, Total	Chromium, Total
Copper, Total	Lead, Total	Mercury, Total	Nickel, Total	Selenium, Total
Silver, Total	Thallium, Total	Zinc, Total	Cyanide, Total	Phenols, Total
Hardness, Total a/				

Notes:

a. A total hardness of the receiving stream needs to be determined every time the above parameters are tested. The hardness is used to calculate parameter criterion(s) according to the North Dakota State Water Quality Standards.

The sampling shall commence within thirty (30) days of the effective date of this permit and continue at a frequency of once per year.

Sampling and analytical procedures shall be in accordance with guidelines established in 40 CFR Part 136. Where sampling methods are not specified the effluent samples collected shall be composite samples consisting of at least twelve (12) aliquots collected at approximately equal intervals over a representative 24-hour period and composited according to flow. Where a flow proportioned composite sample is not practical, the permittee shall collect at least three (3) grab samples, taken at equal intervals over a representative 24-hour period.

Total mercury effluent monitoring at Outfall 002 shall be analyzed to a sufficiently sensitive report/detection level. The report/detection level shall either be: (1) Below or less than the total mercury water quality standards found in NDAC 33.1-16-02.1; or (2) Below or less than a level used to determine whether there is reasonable potential for mercury concentrations in the effluent to cause an excursion above the mercury water quality standards.

The results of all analyses shall be attached to, and reported along with the Discharge Monitoring Report (DMR) submitted for the end of that reporting period.

G. Approval Authority Options

At such time as a specific pretreatment limitation becomes applicable to an industrial user of the permittee, the Approval Authority may, as appropriate:

1. Amend the permittee's North Dakota Pollutant Discharge Elimination System (NDPDES) discharge permit to specify the additional pollutant(s) and corresponding effluent limitation(s) consistent with the applicable Pretreatment Standards;

2. Require the permittee to specify, by ordinance, order, or other enforceable means, the type of pollutant(s) and the maximum amount which may be discharged to the permittee's POTW for treatment. Such requirement shall be imposed in a manner consistent with the POTW program development requirements of the General Pretreatment Regulations at 40 CFR Part 403; and/or,

3. Require the permittee to monitor its discharge for any pollutant which may likely be discharged from the permittee's POTW, should the industrial user fail to properly pre-treat its waste.

H. Enforcement Authority

The Approval Authority retains, at all times, the right to take legal action against any source of nondomestic discharge, whether directly or indirectly controlled by the permittee, for violations of a permit, order or similar enforceable mechanism issued by the permittee, violations of any Pretreatment Standard or requirement, or for failure to discharge at an acceptable level under national standards issued by EPA under 40 CFR, chapter I, subchapter N. In those cases where a North Dakota Pollutant Discharge Elimination System (NDPDES) permit violation has occurred

because of requirements as necessary to protect the POTW, the North Dakota Department of Environmental Quality and/or Approval Authority shall hold the permittee and/or industrial user responsible and may take legal action against the permittee as well as the industrial user(s) contributing to the permit violation.

VI. BENEFICIAL REUSES

A. Irrigation

Only wastewater that has received secondary or tertiary treatment may be used for irrigation provided soil and water compatibility testing confirms the water is suitable for irrigation. Wastewater used for irrigation shall be applied at a rate which would allow complete infiltration and not result in ponding or runoff from the irrigated area.

Agricultural land may be irrigated provided the crop is not used for human consumption. Forage crops used for livestock consumption or pastures irrigated with wastewater shall not be harvested or grazed within 30 days of a wastewater application.

Public properties such as golf courses or parks may be irrigated provided the treated wastewater meets the following quality criteria.

Parameter	Discharge Limitations	Monitoring Frequency	
	Daily Max	Measurement Frequency	Sample Type
BOD_5	30 mg/L	1 per 14 days	Grab
TSS	45 mg/L	1 per 14 days	Grab
E. Coli	126/100 mL	Weekly	Grab

Whenever possible, irrigation shall take place during hours when the public does not have access to the area being irrigated. If the public has constant access to an area, signs must be posted in visible areas during irrigation and for two hours after irrigation is completed. The signs must advise people that the water could pose a health concern and to avoid the irrigated area.

Worker and public contact with treated wastewater should be minimized. Where frequent contact is likely, a higher level of disinfection should be provided such as achieving *E. coli* counts less than 14 colonies per 100 mL.

Avoid application within 100 feet of areas which have unlimited access (i.e., yards) or within 300 feet of potable water supply wells.

Runoff that occurs from irrigated areas shall be monitored at the frequencies and with the types of measurements described in Part I(B).

The permittee shall maintain monitoring records indicating the location and usage (e.g., park or agricultural) of the land being irrigated, the dates irrigation occurred, the amount of wastewater used, and the total flow. In addition, monitoring records must include results from collected samples.

B. Construction

Treated domestic wastewater may be used for construction purposes such as soil compaction, dust suppression and washing aggregate, provided the following conditions are met.

The wastewater intended for use in construction, must at a minimum, receive secondary

treatment.

Prior to using treated wastewater, a sample from the prospective source must be tested and meet the criteria set below. In addition, the test results for *E. coli* must be provided to the department prior to use. Results from samples up to two (2) weeks old will be considered valid. The water quality limitations and minimum sampling frequencies recommended for wastewater used in construction are provided in the following table.

Parameter	Limitations (Maximum)	Measurement Frequency	Sample Type
BOD_5	30 mg/L	1/Month	Grab
TSS	100 mg/L	1/Month	Grab
E. Coli	126/100 mL	1/Week	Grab

While the conventional methods for treating domestic wastewater are generally effective in reducing infectious agents (bacteria, viruses, parasites) to acceptable levels, direct reuse of treated wastewater can pose a health concern. Additional precautions to consider are:

1. Worker and public contact with treated wastewater should be minimized.

2. Where frequent worker contact is likely a higher level of disinfection should be provided, such as achieving *E. coli* counts less than 14/100 mL.

3. Work closely with the treatment system operator to ensure treated wastewater quality is suitable when it is drawn for construction purposes.

4. Apply the treated wastewater in a manner that does not result in runoff or ponding.

Runoff that occurs from application areas shall be monitored at the frequencies and with the types of measurements described in Part I(C).

The permittee shall maintain monitoring records indicating the location and usage of the land where application occurs, the dates application occurred, the amount of wastewater used, and the total flow. In addition, monitoring records must include results from collected samples.

C. Oil and Gas Production (including Hydraulic Fracturing)

The specific user of the wastewater may determine the specific treatment requirements for receiving wastewater.

The permittee shall maintain monitoring records indicating the specific user, the amount of wastewater used, and the total flow. In addition, monitoring records must include results from collected samples.

D. Other Uses as Approved

The permittee must consult with the department before beneficially reusing wastewater for purposes not identified in this permit.

FACT SHEET FOR NDPDES PERMIT
ND0022349

PERMIT REISSUANCE

CITY OF WILLISTON
WILLISTON, ND

DATE OF THE FACT SHEET – FEBRUARY 2023

INTRODUCTION

The Federal Clean Water Act (CWA, 1972, and later amendments in 1977, 1981, and 1987, etc.) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the CWA is the National Pollutant Discharge Elimination System (NPDES), which the US Environmental Protection Agency (EPA) has oversight authority. In 1975, the State of North Dakota was delegated primacy of the NPDES program by EPA. The North Dakota Department of Environmental Quality (NDDEQ), hereafter referred to as "department", has been designated the state water pollution control agency for all purposes of the Federal Water Pollution Control Act, as amended [33 U.S.C. 1251, et seq.], and is hereby authorized to take all action necessary or appropriate to secure to this state the benefits of the act and similar federal acts. The department's authority and obligations for the wastewater discharge permit program is in the NDAC 33.1-16 (North Dakota Administrative Code) which was promulgated pursuant to NDCC chapter 61-28 (North Dakota Century Code). The department uses North Dakota Pollutant Discharge Elimination System (NDPDES) as its permitting title.

The following rules or regulations apply to NDPDES permits:

- Procedures the department follows for issuing NDPDES permits (NDAC chapter 33.1-16-01),
- Standards of Quality for Waters of the State (NDAC chapter 33.1-16-02.1).

These rules require any treatment facility operator to obtain an NDPDES permit before discharging wastewater to state waters. They also define the basis for limits on each discharge and for other requirements imposed by the permit.

According to the North Dakota Administrative Code (NDAC) section 33.1-16-01-08, the department must prepare a draft permit and accompanying fact sheet and make it available for public review. The department must also publish an announcement (public notice) during a period of thirty days, informing the public where a draft permit may be obtained and where comments regarding the draft permit may be sent (NDAC chapter 33.1-16-01-07). For more information regarding preparing and submitting comments about the fact sheet and permit, please see Appendix A - Public Involvement. Following the public comment period, the department may make changes to the draft NDPDES permit. The department will summarize the responses to comments and changes to the permit in Appendix D - Response to Comments.

TABLE OF CONTENTS

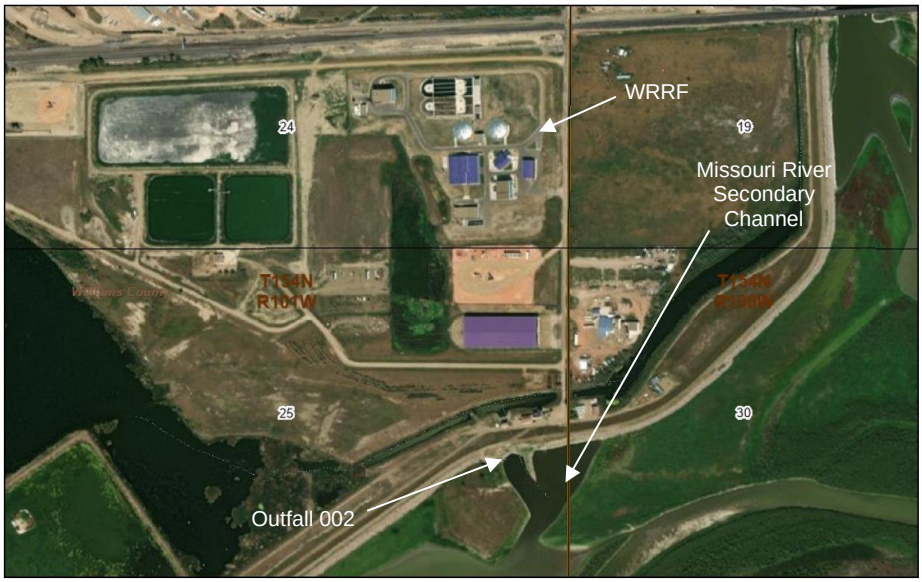
BACKGROUND INFORMATION

Table 1: General Facility Information

Permittee:	City of Williston
Facility Name and Address:	Williston Water Resource Recovery Facility 7 12th Avenue East Williston, ND 58801
Permit Number:	ND0022349
Permit Type:	Major Municipality - Renewal
Type of Treatment:	Advanced Mechanical Wastewater Treatment Plant
SIC Code:	4952
NAICS Code:	221320
Discharge Location:	Outfall 002: Missouri River Secondary Channel, Class I Stream Latitude: 48.1366 Longitude: -103.6055
Hydrologic Code:	10110101 – Lake Sakakawea
Population	27,332 – US Census Estimate as of July 1, 2021

Figure 1 – Aerial Photograph of the city of Williston Water Resource Recovery Facility, Williston, ND (North Dakota Geographic Information System, Map Generated January 2023)

Williston WRRF



January 13, 2023

1:9,028
0 0.05 0.1 0.2 mi
0 0.07 0.15 0.3 km
North Dakota state agencies and the ND GIS Hub, Maxar

Williston Facility Overview

January 13, 2023

1:36,112
0 0.2 0.4 0.8 mi
0 0.33 0.65 1.3 km
North Dakota state agencies and the ND GIS Hub, Maxar

FACILITY DESCRIPTION

The city of Williston Water Resource Recovery Facility (WRRF) consists of an advanced mechanical treatment system to treat municipal waste. The WRRF is located in the SE1/4 SE1/4, Section 24 and NE1/4 NE1/4, Section 25, Township 154N, Range 101W. Construction of the WRRF was completed in 2015. Prior to the WRRF, the city treated sanitary waste with a five-cell waste stabilization pond treatment system. The treatment components of the former treatment system (aeration cells; Cells 1 and 2) are located in Section 24, 26 and 27.

Wastewater that enters the WRRF is treated using screening and grit removal, oxidation, clarification, and ultraviolet disinfection. Extended aeration can be added to treated effluent in case low concentrations of oxygen are experienced. The WRRF also utilizes sodium hypochlorite for internal maintenance of plant water. Treated effluent is discharged continuously to a secondary channel of the Missouri River through Outfall 002.

Outfall 002 is located on the south side of the United States Army Corp of Engineers (USACE) flood protection levee near the Sand Creek Pumping Station. Outfall 002 has a design flow rate of 6.00 million gallons per day (MGD). Treated effluent can also be used for irrigation around the plant site or sent to a load-out station at the WRRF where it is hauled away by truck for industrial purposes.

The waste stabilization pond treatment system is no longer used for wastewater treatment. The former aeration cells and Cells 1 and 2 have been decommissioned. The aeration cells are no longer used and are expected to be reclaimed within the next few years.

According to the NDPDES permit application, the city of Williston services a population of 30,000 people. The WRRF has the ability to expand in phases to accommodate population growth. Currently the WRRF can service a population up to 60,000 people. Subsequent expansions have a design capacity to service a population of 120,000 people.

There is one categorical industrial user (CIU) that discharges to the POTW. Discharges from the CIU to the POTW are permitted by NDPDES pretreatment permit NDP000025. Effluent information from the CIU is reported to the department through the NDPDES pretreatment program. The city accepts trucked septic waste and does not accept trucked hazardous waste. Currently, the city is not required to have an approved pretreatment program.

There are additional sources of excess water (or inflow and infiltration) that flow to the POTW from sources other than municipal waste (e.g., rainwater/groundwater infiltration). To address the issue, the city constructs new infrastructure with water-tight seals. Old infrastructure is replaced in conjunction with street and/or sewer lining projects.

The WRRF generates Class A biosolids. The generation process begins by thickening biosolids with a gravity belt. The thickened biosolids then go to autothermal thermophilic aerobic digestion tanks, then to storage nitrification-denitrification reactor tanks. From there the biosolids pass through a screw press for final thickening and then hauled to the cake storage facility. Finished biosolids are used at the landfill for daily cover. The city determined the finished biosolids can be considered Class A Exceptional Quality (EQ) biosolids following testing.

Runoff from the processing facility is covered by the NDPDES stormwater discharge general permit associated with municipal separate storm sewer systems, NDR04-0000. The general permit coverage number assigned to the city is NDR040017. The general permit requires facilities to develop a stormwater pollution prevention plan (SWPPP) to minimize pollutants that could be discharged in runoff from the POTW.

Discharge Outfall

There are two active discharge outfalls associated with the facility. The description of the active and inactive outfalls is provided below:

Outfall 002. Active. Final.			
Latitude: 48.1366	Longitude: -103.6055	County: Williams	
Township: 154N	Range: 101W	Section: 25	QQ: AAD
Receiving Stream: Secondary Channel of the Missouri River		Classification: Class I	
Outfall Description: Treated effluent flows as a continuous discharge from the Water Resource Recovery Facility. The outfall is located near the U.S. Army Corps of Engineers (USACE) Sand Creek Pumping Station. Discharges are to a secondary channel of the Missouri River.			

Outfall 003. Active. Internal.			
Latitude: 48.1421	Longitude: -103.6082	County: Williams	
Township: 154N	Range: 101W	Section: 24	QQ: DDB
Receiving Stream: Sand Creek Holding Area		Classification: Class III, Wetland	
Outfall Description: This is an interior point that is a sampling site for influent entering the Water Resource Recovery Facility.			

Outfall 001. Not Active. Final.			
Latitude: 48.1325	Longitude: -103.6419	County: Williams	
Township: 154N	Range: 101W	Section: 26	QQ: BD
Receiving Stream: Sand Creek Holding Area		Classification: Class III, Wetland	
Outfall Description: The outfall was for the holding ponds of the stabilization pond treatment system. Discharges were to the Sand Creek Holding Area, a manmade impoundment with characteristics of a wetland/marsh.			

PREVIOUS PERMIT STATUS

The department issued the current permit for this facility on October 1, 2018. The current permit has effluent monitoring requirements for:

- Five-day biochemical oxygen demand (BOD_5)
- Total suspended solids (TSS)
- pH
- *E. coli*
- Ammonia as nitrogen
- Oil and grease
- Temperature
- Total residual chlorine
- Whole effluent toxicity (WET)
- Trace elements
- Nutrients
- Flow
- Volume drained

The permit also has influent monitoring requirements for BOD_5, TSS, pH, ammonia as nitrogen, and trace elements. The permit will expire on March 31, 2023.

SUMMARY OF COMPLIANCE WITH PREVIOUS PERMIT ISSUED

The department's Division of Water Quality and Division of Municipal Facilities conduct yearly inspections of the facility. Nine inspections were conducted since October 2018. The department's assessment of compliance is based on review of the facility's Discharge Monitoring Reports (DMRs) and inspections conducted by department staff.

Bypasses

The city reported two bypasses since 2018. The two bypasses were due to hydraulic overflows caused by excessive rainfall.

Past Discharge Data

The concentration of pollutants in discharges was reported with discharge monitoring report (DMR) forms. Effluent information from outfall 002 is characterized in Table 2. Influent information from outfall 003 is characterized in Table 3.

Table 2: Outfall 002 (October 2018 to December 2022)

Parameter	Units	Range	Average	Permit Limit	Number of Excursions
BOD_5	mg/L	1.64 – 22.67	3.43	25 30-day avg 45 7-day avg	0 0
TSS	mg/L	1 – 29	4	30 30-day avg 45 7-day avg	0 0
pH	S.U.	6.75 – 7.89	N/A	6.5 to 9.0	0
E. coli	#/100 mL	1 – 77.6	1.5 (geometric mean)	126 30-day avg 409 Daily max	0 0
Ammonia as N	mg/L	0.015 – 23.9	0.251	Water Quality Standard	1
Temperature	ºC	6.1 – 23.4	15.5	N/A	N/A
Oil & Grease - Visual	N/A	0 or 1	N/A	0 = No Visible Sheen 1 = Visible Sheen	0
Oil & Grease	mg/L	No Visible Sheen	No Visible Sheen	10 Daily max	0
Chlorine, Total Residual [d]	mg/L	0.03 – 0.04	0.035	0.10 Daily max	0
Nitrogen	mg/L	8.15 – 27.7	14.54	N/A	N/A
Nitrogen	lb/d	481.34 (max)	290.41	N/A	N/A

Table 2: Outfall 002 (October 2018 to December 2022)

Parameter	Units	Range	Average	Permit Limit	Number of Excursions
Phosphorus	mg/L	0.17 – 8.28	2.19	N/A	N/A
Phosphorus	lb/d	143.44 (max)	43.42	N/A	N/A
Flow	MGD	6.622 (max)	2.402	N/A	N/A
Drain	MGAL	57.26 – 114.98	73.17	N/A	N/A
Antimony [b]	ug/L	<1 – 1.6	1.3	N/A	N/A
Arsenic [a,b]	ug/L	<2	<2	N/A	N/A
Beryllium [a,b]	ug/L	<0.5	<0.5	N/A	N/A
Cadmium [a,b]	ug/L	<0.1	<0.1	N/A	N/A
Chromium [a,b]	ug/L	<2	<2	N/A	N/A
Copper [b]	ug/L	<2 – 4.1	2.6	N/A	N/A
Cyanide [c]	mg/L	<0.007	<0.007	N/A	N/A
Lead [b]	ug/L	<0.5 – 2.3	1.1	N/A	N/A
Mercury	ug/L	<0.005 – 0.011	0.008	N/A	N/A
Nickel [b]	ug/L	<2 – 3.9	2.9	N/A	N/A
Phenols [a,b]	mg/L	<0.01 – <0.015	<0.011	N/A	N/A
Selenium	ug/L	<5 – 9	6	N/A	N/A
Silver [a,b]	ug/L	<0.5	<0.5	N/A	N/A
Thallium [a,b]	ug/L	<0.1	<0.1	N/A	N/A
Zinc [b]	ug/L	<50 – 100	73	N/A	N/A
Hardness	mg/L as $CaCO_3$	249 – 285	266	N/A	N/A
Ceriodaphnia dubia	TUa	<1	<1	<1	0
Fathead Minnow	TUa	<1	<1	<1	0
Notes:					
The WRRF removes 98 percent of the BOD_5 and TSS that enters the plant.					

Table 2: Outfall 002 (October 2018 to December 2022)

Parameter	Units	Range	Average	Permit Limit	Number of Excursions
a. All sample results were below detection levels.					
b. All sample results were below the applicable water quality standard for a class I stream.					
c. Results received from the laboratory were below the detection level but greater than the applicable water quality standard for a class I stream. An appropriate reasonable potential analysis cannot be conducted due to inadequate data.					
d. Chlorination only occurred during January 2019.					

Table 3: Outfall 003 (October 2018 to December 2022)

Parameter	Units	Range	Average
BOD_5	mg/L	139 – 392	245
TSS	mg/L	14 – 750	234
pH	S.U.	6.93 – 8.33	N/A
Ammonia as N	mg/L	6.9 – 61.5	28.5
Antimony	ug/L	1.3 – 2.6	2.0
Arsenic	ug/L	<2 – 2.5	2.1
Beryllium [a]	ug/L	<0.5	<0.5
Cadmium	ug/L	0.3 – 0.6	0.4
Chromium	ug/L	3 – 8.1	5
Copper	ug/L	26.6 – 50.9	37.4
Cyanide [a]	mg/L	<0.007	<0.007
Lead	ug/L	3.3 – 7	4.8
Mercury	ug/L	0.053 – <0.2	<0.13
Nickel	ug/L	4 – 10	6.5
Phenols	mg/L	0.049 – 28.7	7.226
Selenium	ug/L	5 – 12.4	7.6
Silver [a]	ug/L	<0.5	<0.5

Table 3: Outfall 003 (October 2018 to December 2022)

Parameter	Units	Range	Average
Thallium [a]	ug/L	<0.1	<0.1
Zinc	ug/L	80 – 160	123
Hardness	mg/L as $CaCO_3$	249 – 285	266
Notes:			
a. All sample results were below detection levels.			

PROPOSED PERMIT LIMITATIONS

Effluent Limitations

The discharge of wastewater generated by the WRRF is regulated by secondary treatment limitations as well as state rules. Secondary treatment limitations may be found in Title 40 of the Code of Federal Regulations, Part 133 (40 CFR 133) and in NDAC chapter 33.1-16-01-30. These regulations describe the minimum level of effluent quality attainable by secondary treatment of municipal wastewater in terms of BOD_5, TSS, and pH. The regulations also include requirements to remove at least 85 percent of the BOD_5 and TSS found in the influent to the WRRF or provide treatment equivalent to secondary treatment under certain circumstances. NDAC chapter 33.1-16-01-14 also establishes additional treatment standards for municipal wastes.

Limitations also may be generated using Best Professional Judgment (BPJ) in the absence of a federal standard to ensure reasonable control technologies are used to prevent potential harmful effects of the discharge. In addition, the department must consider and include limitations necessary to protect water quality standards applicable to the receiving waters.

Limitations based on numeric nutrient criteria are not being included in the proposed permit. Nutrient criteria have yet to be developed for the state of North Dakota. Currently, the water quality standards (WQS) contain a narrative standard stating that surface waters must be free from nutrients in concentrations or loadings that cause objectionable growth of vegetation, algae, or other impairments.

In the current permit, the lower pH effluent limitation was set at 6.5 standard units (S.U.). The limitation was based on EPA's DESCON model which confirmed that if the effluent had a pH of 6.5 S.U., the pH water quality standard of 7.0 S.U. for a Class I stream would be maintained at the end of a mixing. The pH water quality standard of 7.0 S.U. was based on the Standards of Quality for Waters of the State in place at the time the 2018 permit took effect. In July 2021, the lower pH water quality standard for Class I streams changed from 7.0 S.U. to 6.5 S.U. (NDAC chapter 33.1-16-02.1). Based on the change to the water quality standards, the department will maintain a lower pH water quality-based effluent limitation at 6.5 S.U. in the proposed permit. As

such, a mixing zone is not being established for pH and EPA's DESCON model is not being used in the development of the proposed permit.

In the current permit, the ammonia effluent limitation was based on the acute and chronic ammonia water quality standards in place at the time the permit was issued. Since the issuance of the current permit, the ammonia water quality standards changed. As a result, the department updated the acute and chronic ammonia effluent limitations based on the current water quality standards.

The proposed permit includes a mass balance equation for as part of the ammonia effluent limitation. The mass balance equation is meant to calculate the maximum daily ammonia effluent limitation based on an allowable mixing zone. If no flow is present in the secondary channel of the Missouri River or no flow data is available collected, a 1B3 critical low flow (or the lowest 1-day average flow that occurs on average once every 3 years) of 0 cfs shall be used to represent upstream flow in the calculation.

Discharges from outfall 001 discontinued in 2015. The city is not authorized to discharge from outfall 001 under the proposed permit. In the event that water needs to be discharged from the holding ponds or outfall 001, such as for decommissioning the holding ponds, coverage will need to be obtained under one of the general permits for discharges from waste stabilization ponds (NDG12-, 22-, or 320000). The department will specify the appropriate general permit at that time.

The limitations included in the proposed permit are for the WRRF are found in Table 4.

Table 4: Comparison of Effluent Limits of Outfall 002

Effluent Parameter	**30-Day Average**	**7-Day Average**	**Daily Maximum**	**Basis [a]**
BOD_5 [b]	25 mg/L	45 mg/L	N/A	40 CFR 133.102(a) NDAC 33.1-16-01-14(3)(c)(1);
BOD_5 (Removal Efficiency)	Shall not be less than 85%	N/A	N/A	40 CFR 133.102(a)(3)
TSS [c]	30 mg/L	45 mg/L	N/A	40 CFR 133.102(b)
TSS (Removal Efficiency)	Shall not be less than 85%	N/A	N/A	40 CFR 133.102(b)(3)
pH [d]	Between 6.5 and 9.0 s.u.			WQS
Total Residual Chlorine [e]	N/A	N/A	0.10 mg/L	BPJ
Oil & Grease – Visual [f]	N/A	N/A	N/A	WQS
Oil & Grease [f]	N/A	N/A	10 mg/L	BPJ
Escherichia coli (E. coli) [g]	126/100 mL	N/A	409/100 mL	WQS
Temperature	N/A	N/A	*	WQS

Table 4: Comparison of Effluent Limits of Outfall 002

Effluent Parameter	30-Day Average	7-Day Average	Daily Maximum	Basis [a]
Ammonia as N [h]	Refer to the Ammonia Effluent Limitations Table (Table 5)			WQS
Whole Effluent Toxicity	No Acute Toxicity			40 CFR 122.44(d)(1)(iv),(v)
The permittee must not discharge any floating solids, visible foam in other than trace amounts, or oily wastes that produce sheen on the surface of the receiving water. The discharge must be free from materials that produce a color, odor or other condition to such a degree as to create a nuisance.				Previous Permit
All effluent parameters shall be sampled at a point leaving outfall 002 but prior to leaving plant property or entering waters of the state.				Previous Permit

Notes:

a. The basis of the effluent limitations is given below:
"BPJ" refers to best professional judgment.

"Previous Permit" refers to limitations in the previous permit. The NPDES regulations **40 CFR Part 122.44(1)(1) Reissued permits** require that when a permit is renewed or reissued, interim limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit unless the circumstances on which the previous permit was issued have materially and substantially changed since the previous permit was issued and would constitute cause for permit modification or revocation and reissuance under **40 CFR Part 122.62**.

"WQS" refers to effluent limitations based on North Dakota's "Standards of Quality for Waters of the State," NDAC Chapter 33.1-16-02.1.

b. The limits for BOD_5 are based on 40 CFR 133.102(a)(2) "Secondary Treatment Standards," and NDAC Chapter 33.1-16-01-14(3)(c)(1).

c. The limits for TSS are based on 40 CFR 133.102(b), "Secondary Treatment Standards."

d. The limits for pH are based on the WQS for a class I stream.

e. Testing required only during periods when effluent is chlorinated.

f. There shall be no floating oil or visible sheen present in the discharge. If floating oil or a visible sheen is detected in the discharge, the department shall be contacted and a grab sample analyzed to ensure compliance with the concentration limitation. Any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of the permit.

Table 4: Comparison of Effluent Limits of Outfall 002

Effluent Parameter	30-Day Average	7-Day Average	Daily Maximum	Basis [a]
g. The limit for *E. coli* shall apply only during the recreational season, April 1 to October 31. Monitoring for *E. coli* shall be in effect only during the recreational season. Averages for *E. coli* shall be determined as a geometric mean.				
h. The permittee will use Missouri River parameters to calculate the real-time water quality standard for ammonia (refer to the Ammonia Effluent Limitations table for Outfall 002). This calculated limit will be compared to facility effluent data for ammonia. If the effluent value is greater than the calculated limit, the permittee will report a violation.				
*. The thermal mixing zone shall not present a thermal shock or stressor, affect spawning, or block the migration of aquatic organisms.				
N/A Not Applicable				

Table 5: Ammonia Effluent Limitations – Outfall 002

Average Monthly Limitation (AML)
The 30-day average concentration of total ammonia (expressed as N in mg/L) does not exceed the numerical value given by the following formula:

$$AML = 0.8876 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) \times \left(2.126 \times 10^{0.028\times(20-MAX(T,7))}\right)$$

Receiving stream pH and temperature in degrees Celsius are used for the calculation (Refer to Part I(D)(1))

Maximum Daily Limitation (MDL)
The concentration of total ammonia (expressed as N in mg/L) does not exceed the numerical value given by the following formula:

$$MDL = MINIMUM\left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}\right),$$
$$\left(0.7249 \times \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}}\right) \times \left(23.12 \times 10^{0.036\times(20-T)}\right)\right)$$

Receiving stream pH and temperature in degrees Celsius are used for the calculation (Refer to Part I(D)(1))

For the MDL calculation, permittee receives ten percent of the stream flow for dilution at the time of discharge based on the flow of the secondary channel of the Missouri River. If the upstream flow is not available or collected, then the 1B3 critical low flow of 0 cfs shall be used. MDL concentration will be calculated on a mass balance basis using the following formula. The permittee is responsible for units matching in the equation.

MDL Ammonia Effluent Limitation = $(Q_u*C_u + Q_e*C_e)/(Q_u+ Q_e)$ where
Q_u = 10% of the secondary channel of the Missouri River flow parameter (if upstream flow is not available or collected, then the 1B3 critical low flow of 0 cfs shall be used)
C_u = Missouri River ammonia parameter
Q_e = Effluent flow parameter
C_e = Ammonia as N parameter

Notes:
Calculation of the AML must be performed for the calendar month. If an exceedance is detected for the calendar month, the exceedance must be reported on the DMR.

Calculation of the MDL must be performed for each discharge sample. If an exceedance is detected on any single sample, the exceedance must be reported on the DMR.

SELF-MONITORING REQUIREMENTS

Influent/Effluent Monitoring

All effluent parameters will be sampled prior to entering waters of the state.

Table 5: Self-Monitoring Requirements, Outfall 003

Influent Parameter	Frequency	Sample Type [a]
BOD_5	1/week	Composite
TSS	1/week	Composite
pH	1/week	Instantaneous
Ammonia as N	1/week	Composite
Trace Elements (40 CFR 122 Appendix D, Table III)	1/year	Composite
Notes:		
a. Refer to Appendix B for definitions.		

Table 6: Self-Monitoring Requirements, Outfall 002

Effluent Parameter	Frequency	Sample Type [a]
Temperature	1/day [b]	Grab
BOD_5	3/week	Composite
BOD_5 (Removal Efficiency)	1/month	Calculated
TSS	3/week	Composite
TSS (Removal Efficiency)	1/month	Calculated
pH	1/day [b]	Instantaneous
E. coli	3/week	Grab
Nitrogen, Total [c]	1/month	Composite
Ammonia as N	3/week	Composite
Phosphorus, Total	1/month	Composite
Total Residual Chlorine	1/day	Conditional/Grab
Oil & Grease – Visual	1/day [b]	Visual
Oil & Grease	Conditional	Grab
Flow	1/day	Instantaneous
Total Drain	1/month	Calculated
Whole Effluent Toxicity	1/quarter	Grab
Trace Elements (40 CFR 122 Appendix D, Table III)	1/year	Composite
Notes:		
a. Refer to Appendix B for definitions.		
b. Sampling once per day applies during normal daily operations when the facility is staffed. Typically, a work week runs Monday through Friday.		
c. Total nitrogen is a combination of nitrate, nitrite, and Total Kjeldahl Nitrogen (TKN).		

Ambient Monitoring

The proposed permit includes ambient monitoring for pH and temperature in the Missouri River and upstream flow of the secondary channel of the Missouri River. The monitoring frequency for pH and temperature was changed from once per month to three times per week and requires samples to be collected the same day as the ammonia sample. The upstream flow was added to allow for the determination of the MDL ammonia effluent limitation. If an upstream flow is not collected, then the 1B3 critical low flow is reported. The monitoring frequencies are consistent with similar facilities with a continuous discharge and similar ammonia effluent limitations.

Table 7: Ambient Monitoring

Instream Parameter	Frequency	Sample Type [a]
pH [b]	3/week	Instantaneous
Temperature [b]	3/week	Instantaneous
Stream Flow, Upstream [b,c]	3/week	Instantaneous
Notes:		
a. Refer to Appendix B for definitions.		
b. Sample must be collected/recorded the same day as the ammonia sample for Outfall 002.		
c. Upstream flow must represent flow in the secondary channel of the Missouri River. If upstream flow of the secondary channel of the Missouri River is not available or collected, then the 1B3 critical low flow of 0 cfs shall be reported.		

Secondary Treatment Effluent Limits

Federal and state regulations define secondary treatment limitations for municipal wastewater treatment facilities. These effluent limitations are given in 40 CFR 133 and in NDAC Chapter 33.1-16-01-30. These regulations describe the minimum level of effluent quality attainable by secondary treatment of municipal wastewater in terms of BOD_5, TSS, and pH. NDAC Chapter 33.1-16-01-30 incorporates by reference 40 CFR 133 which list the following technology-based limits for BOD_5, TSS, and pH:

Table 8: Secondary Treatment Limits

Parameter	30-Day Average	7-Day Average
BOD_5	25 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
pH	Remain between 6.0 to 9.0	--
Percent Removal	85% BOD_5 and TSS	--

SURFACE WATER QUALITY-BASED EFFLUENT LIMITS

The North Dakota Standards of Quality for Waters of the State (NDAC Chapter 33.1-16-02.1), or Water Quality Standards (WQS), are designed to protect existing water quality and preserve the beneficial uses of North Dakota's surface waters. Wastewater discharge permits must include conditions that ensure the discharge will meet the surface water quality standards. Water quality-based effluent limits may be based on an individual waste load allocation or on a waste

load allocation developed during a basin wide total maximum daily load (TMDL) study. TMDLs result from a scientific study of the water body and are developed in order to reduce pollution from all sources.

The secondary channel of the Missouri River is listed as a class I stream in the Standards of Quality for Waters of the State. The quality of water in class I streams must be suitable for resident fish and other aquatic life, as well as recreational use. The quality also must be suitable for irrigation, stock watering, and wildlife. The quality must be able to meet the bacteriological, physical, and chemical requirements for municipal or domestic use.

The secondary channel of the Missouri River is not listed as impaired in the 2018 North Dakota Section 303(d) List of Waters Needing Total Maximum Daily Loads (303(d) List). A TMDL is not required for the secondary channel.

Numerical Criteria for the Protection of Aquatic Life and Recreation

Numerical water quality criteria are listed in the water quality standards for surface waters (NDAC Chapter 33.1-16-02.1). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. The department uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has published numeric water quality criteria for the protection of human health that are applicable to dischargers. These criteria are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The Water Quality Standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative Criteria

Narrative water quality criteria (NDAC Chapter 33.1-16-02.1-08) limit concentrations of pollutants from exceeding applicable standards of the receiving waters. The department adopted a narrative biological goal solely to provide an additional assessment method that can be used to identify impaired surface waters.

Antidegradation

The purpose of North Dakota's Antidegradation Policy (NDAC Chapter 33.1-16-02 (Appendix IV)) is to:

- Provide all waters of the state one of three levels of antidegradation protection.
- Determine whether authorizing the proposed regulated activity is consistent with antidegradation requirements.

The department's fact sheet demonstrates that the existing and designated uses of the receiving water will be protected under the conditions of the proposed permit.

Mixing Zones

The department's WQS contain a Mixing Zone and Dilution Policy and Implementation Procedure (NDAC Chapter 33.1-16-02.1 (Appendix III)). This policy addresses how mixing and dilution of point source discharges with receiving waters will be addressed in developing chemical-specific and whole effluent toxicity discharge limitations for point source discharges. Depending upon site-specific mixing patterns and environmental concerns, some pollutants/criteria may be allowed a mixing zone or dilution while others may not. In all cases, mixing zone and dilution allowances shall be limited, as necessary, to protect the integrity of the receiving water's ecosystem and designated uses.

EVALUATION OF SURFACE WATER QUALITY-BASED EFFLUENT LIMITS FOR NUMERIC CRITERIA

pH

Discharges to Class I streams shall have an instantaneous limitation between 6.5 (S.U.) and 9.0 (S.U.).

Total Residual Chlorine

Using BPJ the department has determined that a limitation of 0.10 mg/L daily maximum for total residual chlorine is appropriate for this type of facility. Other treatment systems in the state that chlorinate have similar limitations. The limitation will only be in place when effluent is chlorinated.

Oil & Grease

The WQS state that waters of the state must be free from oil or grease attributable to wastewater which causes a visible sheen or film upon the water. Using BPJ the department has determined that a daily maximum limitation of 10 mg/L is appropriate for this type of facility if a visible sheen is detected. Other treatment systems in the state have similar limitations.

Temperature

The department will maintain the narrative thermal mixing zone effluent standard in the proposed permit. Temperatures within a thermal mixing zone may exceed the numeric criteria of the WQS; however, temperatures may not exceed the acute standards. In addition, the thermal mixing zone must meet the WQS found in NDAC 33.1-16-02.1-08. The thermal mixing zone cannot present a thermal shock or stressor, affect spawning, or block the migration of aquatic organisms. Aquatic species use and other beneficial uses must be maintained within the thermal mixing zone.

The department reviewed the basis for the thermal mixing zone found in the 2018 fact sheet and determined there has been no substantial changes to the WRRF or Missouri River that affect

the determination. The following summary from the 2018 renewal fact sheet provides the basis for the determination:

> "The current permit contains language that states the temperature cannot be above 85 degrees Fahrenheit (or 29.44 °*C*). The effluent limitation was based on the state WQS for temperature. The department reviewed the temperature of the effluent from the WRRF as well as the available temperature record measured at U.S. Geological Survey gaging station 06330000—Missouri River near Williston, ND. During the warmer months of the year (June through September) the temperature of the Missouri River increases to around 25 °*C*; typically peaking in late July/early August. The corresponding temperature of the WRRF effluent during these months increases at the same time but does not rise much above 21 °*C*. The highest temperature of the effluent, at 21.6 °*C*, is nearly the same as the 75th-percentile of the mean temperature of the Missouri River during the warmer months.
>
> The monthly temperature of the effluent from the WRRF does not vary appreciably from year-to-year and is not expected to change. Both the temperatures of the effluent and Missouri River do not approach and are not expected to affect the maximum temperature WQS of 29.44 °*C*. Based on this, the department proposes to remove the maximum effluent temperature limitation from the proposed permit since both the temperature of the effluent and Missouri River do not approach the maximum temperature WQS. The department has determined there is no reasonable potential to exceed the maximum temperature effluent limitation from the current permit. The department has also determined that any heat generated in the process of wastewater treatment is *de minimis* and thus proposes to discontinue the limit for temperature of 85 °*F* (or 29.44 °*C*).
>
> The current permit also contains language that states the temperature of the discharge cannot be more than 5 degrees Fahrenheit (2.78 °C) above the receiving stream. The effluent limitation in the current permit was based on the state WQS for temperature and the point of compliance has been at the end-of-pipe. As part of the permit renewal, the department proposes to allow a thermal mixing zone in the secondary channel of the Missouri River and remove the 5 °F (2.78 °C) temperature change limitation from the proposed permit.
>
> As part of the determination, the department developed different effluent and receiving stream dynamics to determine what the resulting mixing temperature would be based on different discharge and receiving water flows and the temperature difference between the effluent and receiving water during colder months. At current effluent flows, the change in temperature of the effluent/river mix was generally below 2.78 °*C*. Changes in temperature greater than 2.78 °*C* generally occurred when there were low flows in the receiving water (approximately 10 cubic feet per second [cfs]) and the difference in temperature between the effluent and river was more than 10 °*C*.
>
> The department also evaluated changes to the thermal mixing zone temperature based on thermal energy of the effluent and receiving stream. A constant effluent flow of 2 mgd was used in the evaluation. The department used the measured temperatures of the effluent and corresponding measured temperature of the river in the evaluation. The evaluation showed that temperature changes above 2.78 °*C* decreased as the receiving stream flow increased. In the early fall and late spring months it took less of an increase in river flow (approximately 9 cfs) to see a temperature change beyond 2.78 °*C*. During the months from late fall to early spring, it took more river flow to not see a temperature change beyond 2.78 °*C*. When the flow of the river was set to 14 cfs, the temperature change did not increase above 2.78 °*C*. River flows within the secondary channel can be influenced by the operation for flood [control.]
>
> The department continued its evaluation of the thermal mixing zone by calculating the thermal effects of the presence of ice on the effluent and receiving stream. The department reviewed

information available for freezing and thawing degree days to estimate the amount of ice generated during the colder months. A freezing degree day is determined by calculating the difference in temperature below the freezing temperature for the average temperature during the day. A thawing degree day is determined the same way but for temperatures above the freezing temperature. The department obtained freezing and thawing degree day information measured at Sloulin Field International Airport in Williston. The information collected extends back to 2015. As part of the evaluation, the department also had to estimate the size of the thermal mixing zone. The width of the receiving stream is approximately 35 meters which allows for a mixing zone length of approximately 350 meters. The department estimated the mixing zone area would be about 8000 square meters.

The department predicted ice thickness within the thermal mixing zone using the methods found in the study "Ice Thickness Prediction: A Comparison of Various Practical Approaches" (Comfort and Abdelnour, 2013). The department calculated the mass of the ice generated per year and the amount of thermal energy needed to melt the ice. Based on the calculations, the thermal energy of the effluent stream was less than the thermal energy of the ice predicted in the thermal mixing zone. The results predict that the thermal energy within the effluent stream would melt ice near the outfall but would not be able to melt all of the ice in the mixing zone during the colder months of the year. As such, the ice in the mixing zone would work to lower the temperature of the receiving stream towards 0 °*C* as the water leaves the mixing zone. This would indicate that the temperature of the effluent stream would not affect the temperature of the receiving stream beyond the thermal mixing zone. The results also predict that the temperature of the effluent stream would have to be approximately 20 °*C* to have enough thermal energy to not allow for the formation of ice in the mixing zone.

Based on this evaluation, the department has determined that it is not necessary to continue the 5 °F (2.78 °C) temperature variation limit in the proposed permit and instead will require a narrative thermal mixing zone effluent standard. The department has determined that removing the 5 °F (2.78 °C) temperature variation limit will not result in backsliding since the thermal mixing zone is still protective of aquatic species and beneficial uses.

E. coli

Based on the WQS, the department has determined that an *E. coli* limitation of 126 organisms per 100 mL as a monthly geometric mean and 409 organisms per 100 mL as a daily maximum is appropriate for this type of facility. The standard only applies during the recreation season from May 1 through September 30. The limitation in the permit is meant to cover the period one month before and one month after the recreation season.

Ammonia as Nitrogen

Discharges from Outfall 002 have the reasonable potential to exceed the acute and chronic WQS for ammonia. The reasonable potential analysis (Appendix C) was conducted using the procedures given in "Technical Support Document (TSD) For Water Quality based Toxics Control"; EPA/505/2-90-001; March 1991.

Numeric ammonia as nitrogen effluent limitations limit will not be established in the proposed permit. Instead, effluent limitations will be calculated based on the acute (*Oncorhynchus* present) and chronic water quality standards to provide real-time effluent limitations. Receiving stream parameters (pH and temperature) will be tested three times per week. Both the acute and chronic WQS are variable and dependent on pH levels and temperature of the receiving

water. As temperatures rise or pH levels increase, ammonia toxicity increases. In 2021, the acute and chronic WQS changed. As such, the acute and chronic WQS used in the 2018 permit are no longer valid. The "*Oncorhynchus* present" acute water quality standard is applicable to discharges from the facility due to the possible presence of the *Oncorhynchus* genus of fish in the receiving water.

Whole Effluent Toxicity (Wet)

The permittee must conduct *Ceriodaphnia dubia* (Water Flea) and *Pimephales promelas* (Fathead Minnow) WET tests. Acute toxicity testing shall occur once each calendar quarter. Acute test failure (LC_{50}) is defined as lethality of 50 percent or more of each test organism at any effluent concentration.

If an acute toxicity test failure occurs, an additional test must be initiated within fourteen days of the initial toxicity findings. If the additional test fails, the department will determine whether a Toxicity Reduction Evaluation (TRE) is necessary.

Human Health

North Dakota's water quality standards include numeric human health-based criteria that the department must consider when writing NDPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria. The department has not identified any chemicals in the applicant's discharges for regulation based on the human heath criteria. The department will re-evaluate this discharge for impacts to human health at the next permit reissuance.

MONITORING REQUIREMENTS

The department requires monitoring, recording, and reporting (NDAC Chapter 33.1-16-01-(21 through 23) and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's limits.

Discharge Monitoring Report (DMR) Requirements

The proposed permit requires the permittee to monitor discharges and submit discharge monitoring reports (DMRs) to the department. DMRs summarize monitoring results obtained during specified monitoring periods. If no discharge occurs during a monitoring period, "no discharge" must be reported.

The proposed permit includes specified intervals for submitting monthly, quarterly, and yearly DMRs (Table 8). DMRs must be submitted electronically to the department in accordance with 40 CFR 127 unless otherwise waived and in compliance with 40 CFR 3. The requirement to submit the 'A' reports monthly, 'W' reports quarterly, and 'Q' reports yearly is similar to other major POTWs.

Table 9: DMR Submittal Requirements

Outfall	Report Designator	Report Type	Report Interval
002	A	Conventional and Non-Conventional Pollutants, Flow and Volume Information	1/month
002	W	Whole Effluent Toxicity Results	1/quarter
002	Q	Trace Elements	1/year
003	A	Conventional and Non-Conventional Pollutants, Flow and Volume Information	1/month
003	Q	Trace Elements	1/year

Biosolids

Currently the department does not have the authority to regulate biosolids. Therefore, the permittee is required under the Direct Enforceability provision of 40 CFR §503.3(b) to meet the applicable requirements of the regulation.

Test Procedures

The collection and transportation of all samples shall conform with EPA preservation techniques and holding times found in 40 CFR 136. All laboratory tests shall be performed by a North Dakota certified laboratory in conformance with test procedures pursuant to 40 CFR 136, unless other test procedures have been specified or approved by EPA as an alternate test procedure under 40 CFR 136.5. The method of determining the total amount of water discharged shall provide results within 10 percent of the actual amount.

OTHER PERMIT CONDITIONS

The proposed permit contains no additional conditions.

The current permit requires the permittee to implement a Mercury Pollutant Minimization Plan (MMP). The MMP is a best management practice (40 CFR 122.44(k)(4)) intended to minimize the amount of mercury that enters the WRRF, consequently minimizing the amount of mercury that discharges from the WRRF. The MMP is meant to control sources of mercury in the collection system as an alternative to analyzing mercury samples at Outfall 002 using EPA Method 1631, Revision E to a sufficiently sensitive report/detection level below the mercury water quality standard. The acute and chronic aquatic life water quality standards for mercury are 1.7 and 0.88 micrograms/liter. The human health water quality standard for a Class I stream is 0.050 micrograms/liter.

During the current permit cycle, the permittee collected four mercury samples from Outfall 002. The samples were analyzed using EPA Method 1631, Revision E to sufficiently sensitive report levels below the mercury water quality standard. The results of the four samples ranged from <0.5 nanograms/liter to 5.89 nanograms/liter (or <0.0005 micrograms/liter to 0.00589 micrograms/liter). A reasonable potential analysis conducted with these results (Appendix C) demonstrated there was no reasonable to potential to exceed the water quality standard for mercury.

Because the permittee utilized sufficiently sensitive methods to analyze mercury concentrations in Outfall 002, a requirement to monitor mercury concentrations to sufficiently sensitive report/detection levels (either below the mercury water quality standards or to a level that indicates no reasonable potential to exceed the mercury water quality standards) was added to Part V(F) of the proposed permit. In addition, the requirement to prepare and implement a MMP was removed from the Special Conditions section of the proposed permit.

INDUSTRIAL WASTE MANAGEMENT

The proposed permit contains general pretreatment language and requirements. The general requirements include protection from any source of non-domestic wastewater which causes Pass Through or Interference; creates a fire or explosion hazard; causes corrosive structural damage; causes obstruction; interferes with the treatment process; includes excessive heat; contains petroleum oil and other products which causes Interference or Pass Through; results in the presence of toxic gases, vapors or fumes in the facility; and is any trucked or hauled pollutant except at designated discharge points.

In addition to the general limitations and requirements, the facility must sample and analyze the influent from outfall 003 and effluent from outfall 002 for those parameters listed in 40 CFR 122, Appendix D, Table III (Table 9). Samples must be collected yearly from outfalls 003 and 002.

Table 10: Parameters from 40 CFR 122, Appendix D, Table III

Antimony, Total	Lead, Total	Zinc, Total
Arsenic, Total	Mercury, Total	Cyanide, Total
Beryllium, Total	Nickel, Total	Phenols, Total
Cadmium, Total	Selenium, Total	Hardness as $CaCO_3$
Chromium, Total	Silver, Total	
Copper, Total	Thallium, Total	

BENEFICIAL REUSE

The proposed permit will continue to contain conditions for the beneficial reuse of wastewater for irrigation, construction, and oil and gas production. Wastewater that has met secondary or tertiary treatment standards may be beneficially reused in lieu of discharging.

Irrigation

Treated effluent may be used for irrigation provided it has gone through secondary or tertiary treatment and is suitable for irrigation. The effluent must be applied in a manner that allows complete infiltration and does not result in ponding or a discharge to waters of the state. Crop used for human consumption cannot be irrigated. Forage crops and pastureland may be irrigated but cannot be harvested or grazed for thirty days following application of treated effluent.

Treated effluent may be used to irrigate public properties if it meets the treatment levels in Table 10. Irrigation must be done during times when the public does not have access to the irrigated area to minimize human contact. Signs must be posted if the public has constant access to the area to keep the public aware. A higher level of disinfection is recommended when frequent

contact is likely. Irrigation should be avoided within 100 feet of areas that have unlimited access, such as a private residence to minimize human contact. Irrigation also should be avoided within 300 feet of drinking water wells to minimize impact to the water source.

Irrigation water must be tested in accordance with Table 10 at a minimum; the results of more frequent testing may be used. Runoff from irrigated areas must be tested the same as a direct discharge.

Table 11: Irrigation Reuse Criteria

Parameter	Units	Secondary Treatment Level (Daily Maximum)	Monitoring Frequency	Sample Type	Basis
BOD_5	mg/L	30	1 per 14 days	Grab	BPJ
TSS	mg/L	45	1 per 14 days	Grab	BPJ
E. Coli	#/100 mL	126	1/Week	Grab	BPJ

Construction

Treated effluent that has gone through secondary treatment may be used for construction purposes (e.g., soil compaction, dust suppression, aggregate washing). Treated effluent must be tested and meet the treatment levels in Table 11. The department considers sample results up to two weeks old to be valid. Runoff from construction areas must be tested the same as a direct discharge.

Table 12: Construction Reuse Criteria

Parameter	Units	Secondary Treatment Level (Daily Maximum)	Monitoring Frequency	Sample Type	Basis
BOD_5	mg/L	30	1/Month	Grab	BPJ
TSS	mg/L	100	1/Month	Grab	BPJ
E. Coli	#/100 mL	126	1/Week	Grab	BPJ

While conventional methods for treating domestic wastewater are generally effective in reducing infectious agents (bacteria, viruses, parasites) to acceptable levels, direct reuse of treated wastewater can pose a health concern. Additional precautions include:

- Minimize worker and public contact with treated wastewater.
- Provide a higher level of disinfection where frequent worker contact is likely such as achieving *E. coli* counts less than 14/100 mL.
- Ensure treated wastewater quality is suitable for construction purposes.
- Apply treated wastewater in a manner that does not result in runoff or ponding.

The current permit discusses chlorinating water used for construction purposes when frequent worker or public contact occurs and maintaining a chlorine residual of at least 0.1 mg/L. Since the facility uses UV for disinfection and would only chlorinate for a specific maintenance

purpose and not for disinfection, the discussion was removed from the proposed permit.

Oil and Gas Production (including Hydraulic Fracturing)

The specific user of wastewater used for oil and gas production is expected to determine the specific treatment requirements before receiving the wastewater.

Other Uses as Approved

The permittee must consult with the department before beneficially reusing wastewater for purposes not identified in the permit.

PERMIT ISSUANCE PROCEDURES

Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. This includes the establishment of limitations or prohibitions based on changes to Water Quality Standards, the development and approval of waste load allocation plans, the development or revision to water quality management plans, changes in sewage sludge practices, or the establishment of prohibitions or more stringent limitations for toxic or conventional pollutants and/or sewage sludges. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Proposed Permit Issuance

This proposed permit meets all statutory requirements for the department to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the State of North Dakota. The department proposes to issue this permit for a term of five years.

APPENDIX A – PUBLIC INVOLVEMENT INFORMATION

The department proposes to reissue a permit for the **City of Williston**. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and the department's reasons for requiring permit conditions.

The department will place a Public Notice of Draft on **February 22, 2023** in the **Williston Herald** to inform the public and to invite comment on the proposed draft North Dakota Pollutant Discharge Elimination System permit and fact sheet.

The Notice –

- Indicates where copies of the draft Permit and Fact Sheet are available for public evaluation.
- Offers to provide assistance to accommodate special needs.
- Urges individuals to submit their comments before the end of the comment period.
- Informs the public that if there is significant interest, a public hearing will be scheduled.

You may obtain further information from the department by telephone, 701.328.5210, or by writing to the address listed below.

North Dakota Department of Environmental Quality
Division of Water Quality
4201 Normandy Street
Bismarck, ND 58503-1324

The primary author of this permit and fact sheet is Dallas Grossman.

North Dakota Department of Environmental Quality Public Notice
Reissue of an NDPDES Permit

Public Notice Date: 2/22/2023 Public Notice Number: ND-2023-006

Purpose of Public Notice
The Department intends to reissue the following North Dakota Pollutant Discharge Elimination System (NDPDES) Discharge Permit under the authority of Section 61-28-04 of the North Dakota Century Code.

Permit Information
Application Date: 10/5/2022 Application Number: ND0022349

Applicant Name: Williston City Of

Mailing Address: PO Box 2437, Williston, ND 58802-2437

Telephone Number:

Proposed Permit Expiration Date: 3/31/2028

Facility Description
The reapplication is for a water resource recovery facility that services the City of Williston. The facility is located in the SE1/4 SE1/4 Section 24 and NE1/4 NE1/4 Section 25, Township 154N, Range 101W. Any discharge from the facility would be to the secondary channel of the Missouri River south of the facility.

Tentative Determinations
Proposed effluent limitations and other permit conditions have been made by the Department. They assure that State Water Quality Standards and applicable provisions of the FWPCAA will be protected.

Information Requests and Public Comments
Copies of the application, draft permit, and related documents are available for review. For further information on making public comments/public comment tips please visit: https://deq.nd.gov/PublicCommentTips.aspx. Comments or requests should be directed to the ND Dept of Env Quality, Div of Water Quality, 4201 Normandy Street, Bismarck ND 58503-1324 or by calling 701.328.5210.

All comments received by March 23, 2023 will be considered prior to finalizing the permit. If there is significant interest, a public hearing will be scheduled. Otherwise, the Department will issue the final permit within sixty (60) days of this notice.

The NDDEQ will consider every request for reasonable accommodation to provide an accessible meeting facility or other accommodation for people with disabilities, language interpretation for people with limited English proficiency (LEP), and translations of written material necessary to access programs and information. To request accommodations, contact the NDDEQ Non-discrimination Coordinator at 701-328-5210 or deqEJ@nd.gov. TTY users may use Relay North Dakota at 711 or 1-800-366-6888.

APPENDIX B – DEFINITIONS

DEFINITIONS Standard Permit BP 2019.05.29

1. "**Act**" means the Clean Water Act.

2. "**Average monthly discharge limitation**" means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

3. "**Average weekly discharge limitation**" means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

4. "**Best management practices**" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage areas.

5. "**Bypass**" means the intentional diversion of waste streams from any portion of a treatment facility.

6. "**Composite**" sample means a combination of at least 4 discrete sample aliquots, collected over periodic intervals from the same location, during the operating hours of a facility not to exceed a 24-hour period. The sample aliquots must be collected and stored in accordance with procedures prescribed in the most recent edition of Standard Methods for the Examination of Water and Wastewater.

7. "**Daily discharge**" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

8. "**Department**" means the North Dakota Department of Environmental Quality, Division of Water Quality.

9. "**DMR**" means discharge monitoring report.

10. "**EPA**" means the United States Environmental Protection Agency.

11. "**Geometric mean**" means the n^{th} root of a product of n factors, or the antilogarithm of the arithmetic mean of the logarithms of the individual sample values.

12. "**Grab**" for monitoring requirements, means a single "dip and take" sample collected at a representative point in the discharge stream.

13. "**Instantaneous**" for monitoring requirements, means a single reading, observation, or measurement. If more than one sample is taken during any calendar day, each result obtained shall be considered.

14. "**Maximum daily discharge limitation**" means the highest allowable "daily discharge."

15. "**Salmonid**" means of, belonging to, or characteristic of the family Salmonidae, which includes the salmon, trout, and whitefish.

16. "**Sanitary Sewer Overflows (SSO)**" means untreated or partially treated sewage overflows from a sanitary sewer collection system.

17. "**Severe property damage**" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

18. "**Total drain**" means the total volume of effluent discharged.

19. "**Upset**" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

DEFINITIONS Whole Effluent Toxicity (WET) BP 2017.04.06

1. "**Acute toxic unit**" ("TUa") is a measure of acute toxicity. TUa is the reciprocal of the effluent concentration that causes 50 percent of the organisms to die by the end of the acute exposure period (i.e., 100/"LC50").

2. "**Chronic toxic unit**" ("TUc") is a measure of chronic toxicity. TUc is the reciprocal of the effluent concentration that causes no observable effect on the test organisms by the end of the chronic exposure period (i.e., 100/"IC25").

3. "**Inhibition concentration**", ("IC"), is a point estimate of the toxicant concentration that causes a given percent reduction (p) in a non-quantal biological measurement (e.g., reproduction or growth) calculated from a continuous model (e.g., Interpolation Method).

4. "**LC50**" means the concentration of toxicant (e.g., effluent) which is lethal to 50 percent of the organisms exposed in the time period prescribed by the test.

5. "**No observed effect concentration**", ("NOEC"), is the highest concentration of toxicant

(e.g., effluent) to which organisms are exposed in a chronic toxicity test [full life-cycle or partial life-cycle (short term) test], that causes no observable adverse effects on the test organisms (i.e., the highest concentration of effluent in which the values for the observed responses are not statistically significantly different from the controls).

APPENDIX C – DATA AND TECHNICAL CALCULATIONS

The North Dakota Department of Environmental Quality reviewed the NDPDES permit application, DMR information, applicable water quality standards for class I streams, and available stream data to determine the appropriate requirements to be placed in the permit.

AMMONIA AS NITROGEN

Reasonable Potential Analysis
The reasonable potential determination for ammonia is provided below. The determination was conducted utilizing the Technical Support Document For Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991 (TSD; March 1991).

Flow data is not available for the secondary channel of the Missouri River. In order to determine critical low flows used to conduct the reasonable potential analysis, secondary channel cross-sectional information and flow measurements provided to the department as part of the 2012 permit renewal were reviewed. Based on the information, the department determined critical low flows in the secondary channel would be 0 cubic feet per second during critical low flows of the Missouri River.

An ammonia concentration of 0.070 mg/L was chosen to represent the ambient ammonia concentration for the reasonable potential analysis. Ambient ammonia concentrations were obtained from three U.S. Geological Survey monitoring stations: 063300000 – Missouri River near Williston, ND; 06185500 – Missouri River near Culbertson, MT; and 06329500 – Yellowstone River near Sidney, MT. The ambient concentration of 0.070 mg/L represents the 75^{th}-percentile of available data. The 75^{th}-percentile is slightly higher than the higher-end confidence value of 0.061 mg/L based on a 95% confidence level.

The acute and chronic ammonia water quality standards used in the reasonable potential analysis were calculated based on the 2021 revision to the North Dakota Standards of Quality for Waters of the State (NDAC Chapter 33.1-16-02.1). The "*Oncorhynchus* present" acute water quality standard was used in the analysis due to the possible presence of the *Oncorhynchus* genus of fish in the receiving water. The water quality standards are pH and temperature dependent. As pH or temperature increases, the standard becomes more restrictive (or decreases). Figures 1 through 4 show how ammonia concentrations can change when pH or temperature change.

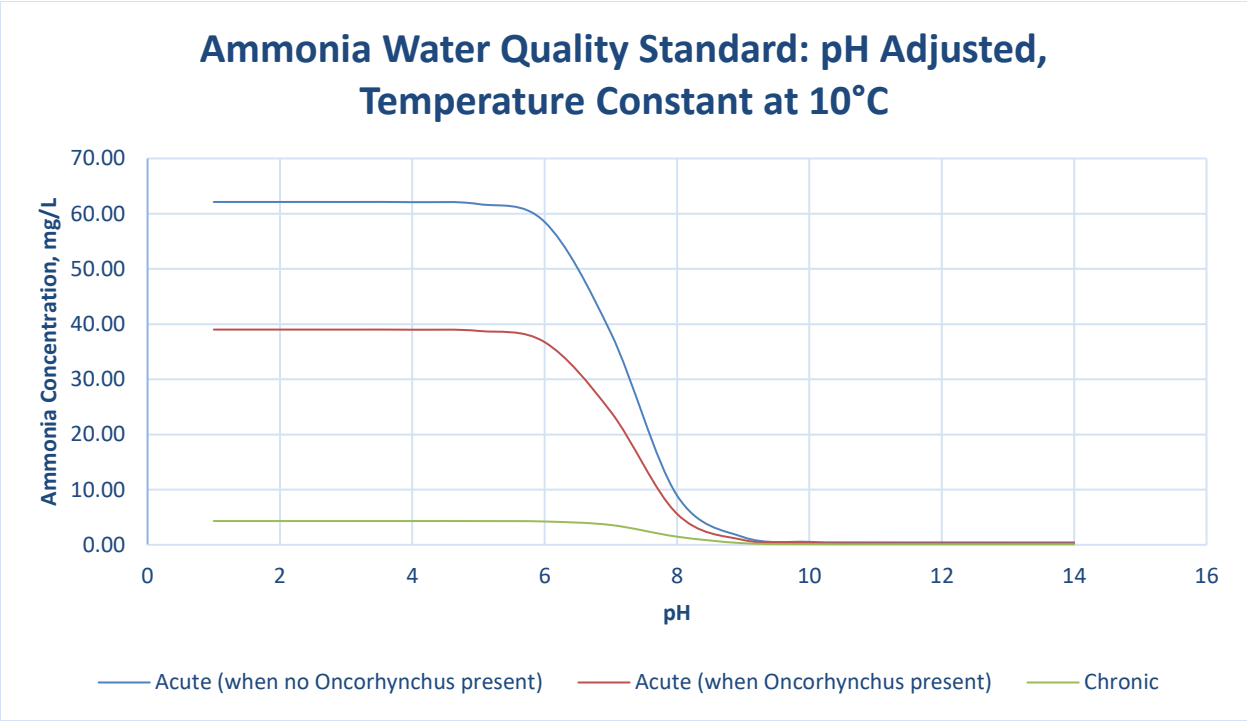


Figure 1

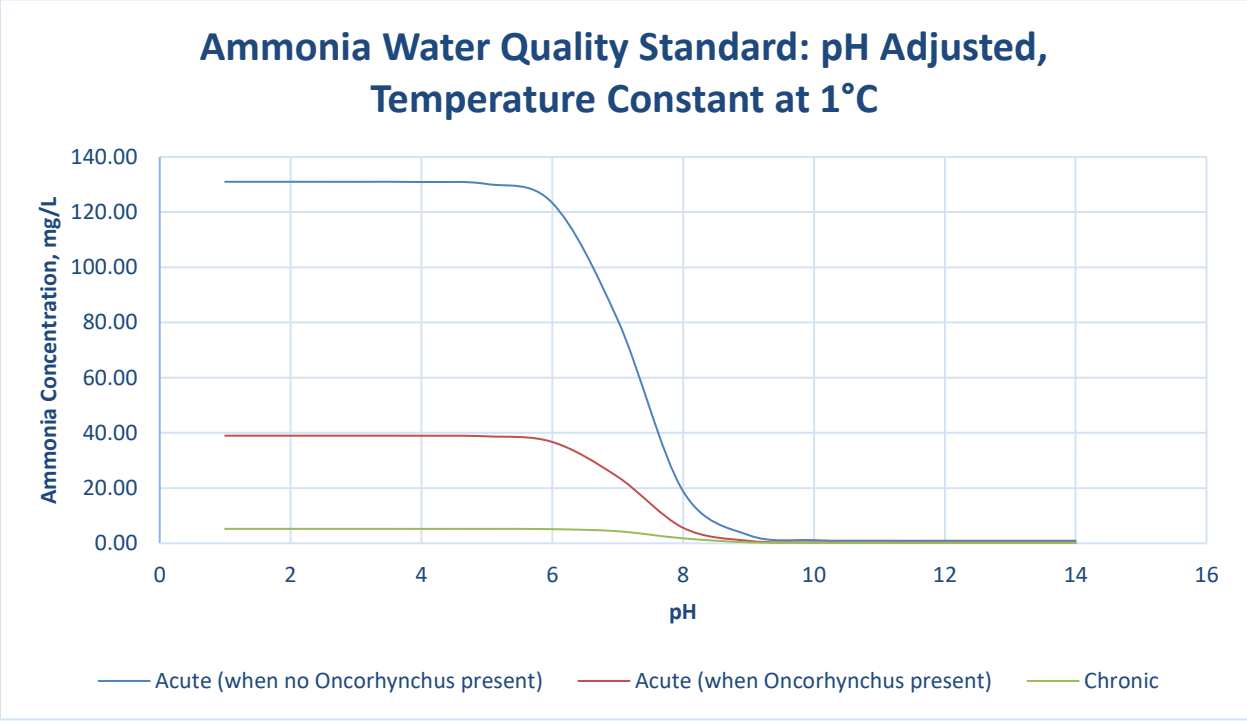


Figure 2

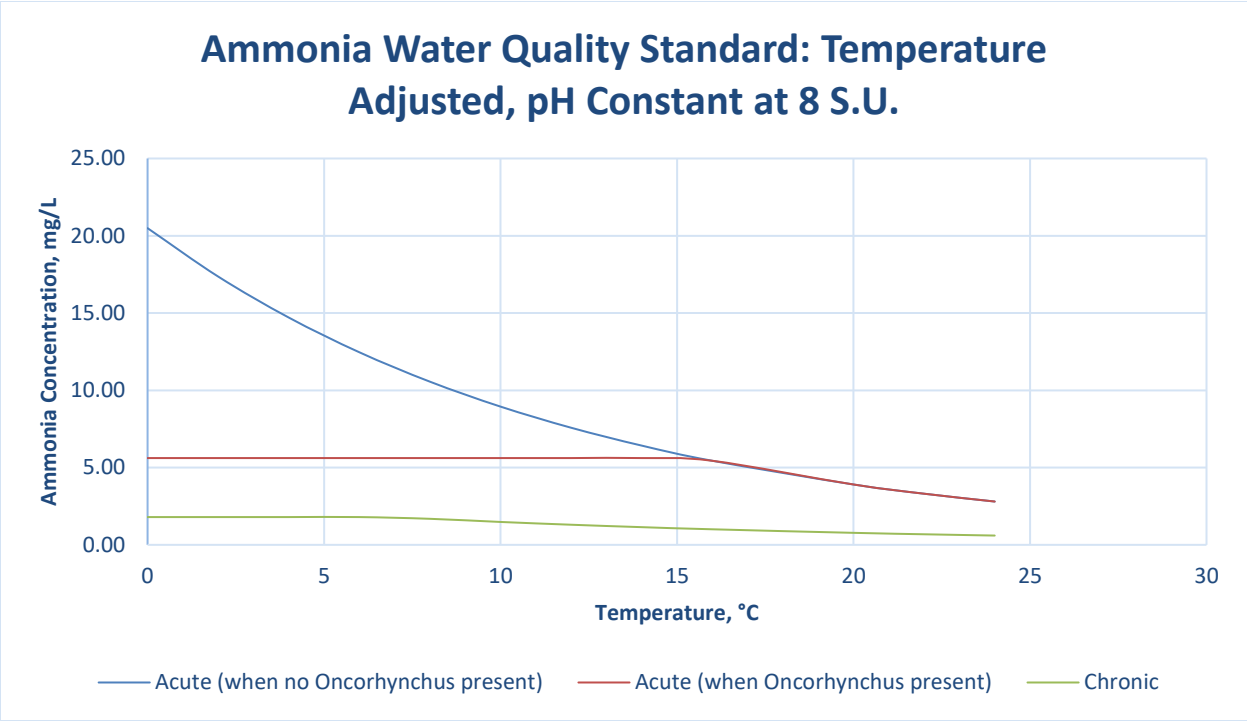


Figure 3

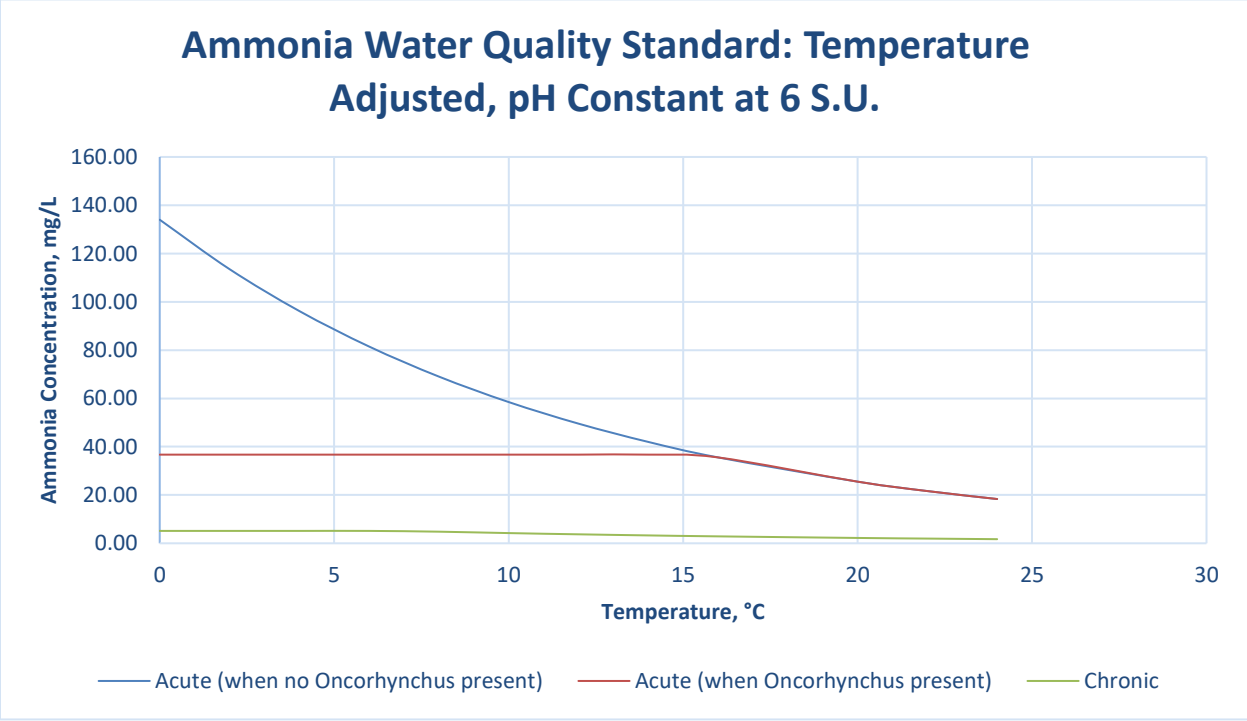


Figure 4

Ambient data (i.e., pH and temperature) used to calculate representative acute and chronic water quality concentrations for use in the reasonable potential analysis were obtained from U.S. Geological Survey monitoring station 06330000 – Missouri River near Williston, ND. The data was broken into three timeframes – January through December, June through September, October through May – representing the entire year, warmer months, and colder months, respectively.

The ambient data for pH had a normal distribution within each timeframe with means ranging from 7.7 to 7.8 standard units (S.U.) and upper and lower 95% confidence intervals ranging from of 7.8 to 7.9 S.U. and 7.7 to 7.8 S.U., respectively. Temperatures for the entirety of the year and colder months had a log-normal distribution with a majority of the temperature readings at or slightly above 0°C. Temperatures for the warmer months had a normal distribution with a mean of 19.2°C and upper and lower 95% confidence interval from 19.1°C to 19.4°C. Based on the data, a pH value of 7.8 and temperature of 19.4°C were selected to determine the acute and chronic water quality standards. For acute, because the water quality standards become more restrictive as pH and temperature increase, these values represent a reasonable likelihood of encountering the water quality standards in the receiving stream. The resulting "*Oncorhynchus* present" acute and chronic water quality standards are 5.92 mg/L and 1.06 mg/L, respectively.

The results of the reasonable potential analysis are provided in Figure 5. The statistical multiplier of 6.8 was taken from Table 3-1 of the TSD (99% Confidence Level and 99% Probability Analysis). It was chosen based on 697 collected effluent samples with a calculated coefficient of variation (CV) of 2.912. The multiplying factor is multiplied by the highest ammonia concentration in the effluent. If the resulting number is higher than a water quality standard after applying appropriate effluent/receiving water mixing, then there is reasonable potential to exceed the water quality standard.

Receiving Water Concentration (RWC)
Reasonable Potential (RP)
Determination

Technical Support Document (TSD) For Water Quality-based Toxics Control
EPA/505/2-90-001; March 1991

Facility Name:	Williston	Receiving Stream:	Secondary Channel Missouri River
NDPDES Permit:	ND0022349	1Q10 Acute	0 cfs
Daily Maximum Flow (mgd):	6.62	1B3 Acute	0 cfs
Daily Average Flow (mgd):	2.40	7Q10 Chronic	0 cfs
Stream Design Mixing:	10.0%	4B3 Chronic	0 cfs
Statistical Multiplier:	6.8		
Upstream Concentration:	0.0700 mg/l		**Parameter:**
Effluent Concetration (max):	23.9000 mg/l		**Ammonia**

$$RWC = \frac{(StatQeCe)+(Cs(pmf)Qs)}{Qe+(pmf)Qs}$$

Outfall: **002**

RWC = Receiving water concentration, the resultant magnitude of concentration in the receiving water after effluent discharge concentration (also known as the in-stream waste concentration)
Stat = Statistical multiplier for effluent parameter (Table 3-1 and 3-2; page 57 of the TSD)
Qe = Effluent Design Flow
Ce = Highest effluent concentration reported.
pmf = Partial mix factor, percent of Qs allowed for mixing by State authority.
Qs = Receiving Water Flow (1Q10 or 1B3 for acute and 7Q10 or 4B3 for chronic)
Cs = Background concentration of the receiving water.

Qe - Acute	6.62	mgd	Qs - 1Q10	0.00	mgd
Qe - Chronic	2.40	mgd	Qs - 1B3	0.00	mgd
Ce	23.9000	mg/l	Qs - 7Q10	0.00	mgd
Cs	0.0700	mg/l	Qs - 4B3	0.00	mgd
Stat	6.80				
pmf	10.0%				

Acute RP			Chronic RP		
RWC - 1Q10	162.5200	mg/l	RWC - 7Q10	162.5200	mg/l
RWC - 1B3	162.5200	mg/l	RWC - 4B3	162.5200	mg/l

Criterion Maximum Concentration (CMC)		Criterion Continuous Concentration (CCC)	
Acute Criterion	5.92 mg/l	Chronic Criterion	1.0600 mg/l

If the calculated RWC is greater than its respective criterion then there is RP and if RWC is less than the criterion then there is no RP.

CMC RP Present:		**CCC RP Present:**	
1Q10 Acute OR	**YES**	**7Q10 Chronic OR**	**YES**
1B3 Acute	**YES**	**4B3 Chronic**	**YES**

The North Dakota State Water Quality Standards (WQS) Chapter 33-16-02.1 use biologically based design and harmonic mean flows to determine Water Quality Based Effluent Limits (WQBELs) and Whole Effluent Toxicity (WET) limits.

CYANIDE, TOTAL

The RP determination for total cyanide in Outfall 002 is provided below. The determination was conducted utilizing the Technical Support Document For Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991 (TSD; March 1991).

The data set for the RP analysis included four samples of the effluent and all available data from USGS Monitoring Station 06330000-Missouri River near Williston, ND. A default coefficient of variation (CV) of 0.6 was used since less than ten samples were included in the data set. The statistical multiplier based on the 95th percentile occurrence probability was 2.6. The upstream concentration used in the RP analysis was 0 mg/L since no cyanide results were reported at USGS Monitoring Station 06330000. The maximum effluent concentration used in the RP analysis was 0.007 mg/L. Based on the RP analysis, the department found there to be no reasonable potential for total cyanide to be above the acute aquatic life standard.

A reliable RP analysis could not be conducted to determine the reasonable potential for total cyanide to be above the chronic aquatic life and human health water quality standard criteria. This is because there is no instream data for cyanide (i.e., no monitoring was conducted). Additionally, the detection/report limit for all sample results was below detection but above water aquatic life and human health water quality standards. This creates a condition where mathematically determining a potential to exceed the water quality standard by mixing the effluent and receiving stream always results in an exceedance of the water quality standard.

Receiving Water Concentration (RWC)
Reasonable Potential (RP)
Determination

Technical Support Document (TSD) For Water Quality-based Toxics Control
EPA/505/2-90-001; March 1991

Facility Name:	Williston	Receiving Stream:	Secondary Channel Missouri River	
NDPDES Permit:	ND0022349	1Q10 Acute	0	cfs
Daily Maximum Flow (mgd):	6.62	1B3 Acute	0	cfs
Daily Average Flow (mgd):	2.40	7Q10 Chronic	0	cfs
Stream Design Mixing:	10.0%	4B3 Chronic	0	cfs
Statistical Multiplier:	2.6			
Upstream Concentration:	0.0000	mg/l	**Parameter:**	
Effluent Concetration (max):	0.0070	mg/l	**Cyanide, Total, A.L.**	

$$RWC = \frac{(StatQeCe)+(Cs(pmf)Qs)}{Qe+(pmf)Qs}$$

Outfall: **002**

RWC = Receiving water concentration, the resultant magnitude of concentration in the receiving water after effluent discharge concentration (also known as the in-stream waste concentration)
Stat = Statistical multiplier for effluent parameter (Table 3-1 and 3-2; page 57 of the TSD)
Qe = Effluent Design Flow
Ce = Highest effluent concentration reported.
pmf = Partial mix factor, percent of Qs allowed for mixing by State authority.
Qs = Receiving Water Flow (1Q10 or 1B3 for acute and 7Q10 or 4B3 for chronic)
Cs = Background concentration of the receiving water.

Qe - Acute	6.62	mgd	Qs - 1Q10	0.00	mgd
Qe - Chronic	2.40	mgd	Qs - 1B3	0.00	mgd
Ce	0.0070	mg/l	Qs - 7Q10	0.00	mgd
Cs	0.0000	mg/l	Qs - 4B3	0.00	mgd
Stat	2.60				
pmf	10.0%				

Acute RP			Chronic RP		
RWC - 1Q10	0.0182	mg/l	RWC - 7Q10	0.0182	mg/l
RWC - 1B3	0.0182	mg/l	RWC - 4B3	0.0182	mg/l

Criterion Maximum Concentration (CMC)			Criterion Continuous Concentration (CCC)		
Acute Criterion	0.022	mg/l	Chronic Criterion	0.0052	mg/l

If the calculated RWC is greater than its respective criterion then there is RP and if RWC is less than the criterion then there is no RP.

CMC RP Present:		**CCC RP Present:**	
1Q10 Acute OR	**NO**	**7Q10 Chronic OR**	**YES**
1B3 Acute	**NO**	**4B3 Chronic**	**YES**

The North Dakota State Water Quality Standards (WQS) Chapter 33-16-02.1 use biologically based design and harmonic mean flows to determine Water Quality Based Effluent Limits (WQBELs) and Whole Effluent Toxicity (WET) limits.

Receiving Water Concentration (RWC)
Reasonable Potential (RP)
Determination

Technical Support Document (TSD) For Water Quality-based Toxics Control
EPA/505/2-90-001; March 1991

Facility Name:	Williston	Receiving Stream:	Secondary Channel Missouri River	
NDPDES Permit:	ND0022349	1Q10 Acute	0	cfs
Daily Maximum Flow (mgd):	6.62	1B3 Acute	0	cfs
Daily Average Flow (mgd):	2.40	7Q10 Chronic	0	cfs
Stream Design Mixing:	10.0%	4B3 Chronic	0	cfs
Statistical Multiplier:	2.6			
Upstream Concentration:	0.0000	mg/l	**Parameter:**	
Effluent Concetration (max):	0.0070	mg/l	**Cyanide, Total, H.H.**	

$$RWC = \frac{(StatQeCe)+(Cs(pmf)Qs)}{Qe+(pmf)Qs}$$

Outfall: 002

RWC = Receiving water concentration, the resultant magnitude of concentration in the receiving water after effluent discharge concentration (also known as the in-stream waste concentration)
Stat = Statistical multiplier for effluent parameter (Table 3-1 and 3-2; page 57 of the TSD)
Qe = Effluent Design Flow
Ce = Highest effluent concentration reported.
pmf = Partial mix factor, percent of Qs allowed for mixing by State authority.
Qs = Receiving Water Flow (1Q10 or 1B3 for acute and 7Q10 or 4B3 for chronic)
Cs = Background concentration of the receiving water.

Qe - Acute	6.62	mgd	Qs - 1Q10	0.00	mgd
Qe - Chronic	2.40	mgd	Qs - 1B3	0.00	mgd
Ce	0.0070	mg/l	Qs - 7Q10	0.00	mgd
Cs	0.0000	mg/l	Qs - 4B3	0.00	mgd
Stat	2.60				
pmf	10.0%				

Acute RP			Chronic RP		
RWC - 1Q10	0.0182	mg/l	RWC - 7Q10	0.0182	mg/l
RWC - 1B3	0.0182	mg/l	RWC - 4B3	0.0182	mg/l

Criterion Maximum Concentration (CMC)			Criterion Continuous Concentration (CCC)		
Acute Criterion	0.004	mg/l	Chronic Criterion	0.0040	mg/l

If the calculated RWC is greater than its respective criterion then there is RP and if RWC is less than the criterion then there is no RP.

CMC RP Present:		**CCC RP Present:**	
1Q10 Acute OR	**YES**	**7Q10 Chronic OR**	**YES**
1B3 Acute	**YES**	**4B3 Chronic**	**YES**

The North Dakota State Water Quality Standards (WQS) Chapter 33-16-02.1 use biologically based design and harmonic mean flows to determine Water Quality Based Effluent Limits (WQBELs) and Whole Effluent Toxicity (WET) limits.

MERCURY, TOTAL AND MERCURY POLLUTION MINIMIZATION PLAN

The RP determination for total mercury in Outfall 002 based on significantly sensitive report/detection levels is provided below. The determination was conducted utilizing the Technical Support Document For Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991 (TSD; March 1991).

The data set for the RP analysis included four samples of the effluent and all available data from three U.S. Geological Survey monitoring stations: 063300000 – Missouri River near Williston, ND; 06185500 – Missouri River near Culbertson, MT; and 06329500 – Yellowstone River near Sidney, MT. The ambient concentration of 0.5 ug/L represents the 75th-percentile of available data. The 75th-percentile is slightly higher than the higher-end confidence value of 0.448 ug/L based on a 95% confidence level. A default coefficient of variation (CV) of 0.6 was used since less than ten samples were included in the data set. The statistical multiplier based on the 95th-percentile occurrence probability was 2.6.

The maximum effluent concentration used in the RP analysis was 0.00589 ug/L. Based on the RP analysis, the department found there to be no reasonable potential for total mercury to be above the acute and chronic aquatic life standards and human health standard.

Receiving Water Concentration (RWC)
Reasonable Potential (RP)
Determination

Technical Support Document (TSD) For Water Quality-based Toxics Control
EPA/505/2-90-001; March 1991

Facility Name:	Williston	Receiving Stream:	Secondary Channel Missouri River
NDPDES Permit:	ND0022349	1Q10 Acute	0 cfs
Daily Maximum Flow (mgd):	6.62	1B3 Acute	0 cfs
Daily Average Flow (mgd):	2.40	7Q10 Chronic	0 cfs
Stream Design Mixing:	10.0%	4B3 Chronic	0 cfs
Statistical Multiplier:	2.6		
Upstream Concentration:	0.0005 mg/l		**Parameter:**
Effluent Concetration (max):	0.0000 mg/l		**Mercury, Total, A.L.**

$$RWC = \frac{(StatQeCe)+(Cs(pmf)Qs)}{Qe+(pmf)Qs}$$

Outfall: **002**

RWC = Receiving water concentration, the resultant magnitude of concentration in the receiving water after effluent discharge concentration (also known as the in-stream waste concentration)
Stat = Statistical multiplier for effluent parameter (Table 3-1 and 3-2; page 57 of the TSD)
Qe = Effluent Design Flow
Ce = Highest effluent concentration reported.
pmf = Partial mix factor, percent of Qs allowed for mixing by State authority.
Qs = Receiving Water Flow (1Q10 or 1B3 for acute and 7Q10 or 4B3 for chronic)
Cs = Background concentration of the receiving water.

Qe - Acute	6.62	mgd	Qs - 1Q10	0.00	mgd
Qe - Chronic	2.40	mgd	Qs - 1B3	0.00	mgd
Ce	0.0000	mg/l	Qs - 7Q10	0.00	mgd
Cs	0.0005	mg/l	Qs - 4B3	0.00	mgd
Stat	2.60				
pmf	10.0%				

Acute RP			Chronic RP		
RWC - 1Q10	0.0000	mg/l	RWC - 7Q10	0.0000	mg/l
RWC - 1B3	0.0000	mg/l	RWC - 4B3	0.0000	mg/l

Criterion Maximum Concentration (CMC)		Criterion Continuous Concentration (CCC)	
Acute Criterion	0.0017 mg/l	Chronic Criterion	0.0009 mg/l

If the calculated RWC is greater than its respective criterion then there is RP and if RWC is less than the criterion then there is no RP.

CMC RP Present:		**CCC RP Present:**	
1Q10 Acute OR	**NO**	**7Q10 Chronic OR**	**NO**
1B3 Acute	**NO**	**4B3 Chronic**	**NO**

The North Dakota State Water Quality Standards (WQS) Chapter 33-16-02.1 use biologically based design and harmonic mean flows to determine Water Quality Based Effluent Limits (WQBELs) and Whole Effluent Toxicity (WET) limits.

Receiving Water Concentration (RWC)
Reasonable Potential (RP)
Determination

Technical Support Document (TSD) For Water Quality-based Toxics Control
EPA/505/2-90-001; March 1991

Facility Name:	Williston	Receiving Stream:	Secondary Channel Missouri River
NDPDES Permit:	ND0022349	1Q10 Acute	0 cfs
Daily Maximum Flow (mgd):	6.62	1B3 Acute	0 cfs
Daily Average Flow (mgd):	2.40	7Q10 Chronic	0 cfs
Stream Design Mixing:	10.0%	4B3 Chronic	0 cfs
Statistical Multiplier:	2.6		
Upstream Concentration:	0.0005	mg/l	**Parameter:**
Effluent Concetration (max):	0.0000	mg/l	**Mercury, Total, H.H.**

$$RWC = \frac{(StatQeCe)+(Cs(pmf)Qs)}{Qe+(pmf)Qs}$$

Outfall: 002

RWC = Receiving water concentration, the resultant magnitude of concentration in the receiving water after effluent discharge concentration (also known as the in-stream waste concentration)
Stat = Statistical multiplier for effluent parameter (Table 3-1 and 3-2; page 57 of the TSD)
Qe = Effluent Design Flow
Ce = Highest effluent concentration reported.
pmf = Partial mix factor, percent of Qs allowed for mixing by State authority.
Qs = Receiving Water Flow (1Q10 or 1B3 for acute and 7Q10 or 4B3 for chronic)
Cs = Background concentration of the receiving water.

Qe - Acute	6.62	mgd	Qs - 1Q10	0.00	mgd
Qe - Chronic	2.40	mgd	Qs - 1B3	0.00	mgd
Ce	0.0000	mg/l	Qs - 7Q10	0.00	mgd
Cs	0.0005	mg/l	Qs - 4B3	0.00	mgd
Stat	2.60				
pmf	10.0%				

Acute RP			Chronic RP		
RWC - 1Q10	0.0000	mg/l	RWC - 7Q10	0.0000	mg/l
RWC - 1B3	0.0000	mg/l	RWC - 4B3	0.0000	mg/l

Criterion Maximum Concentration (CMC)			Criterion Continuous Concentration (CCC)		
Acute Criterion	0.00005	mg/l	Chronic Criterion	0.0001	mg/l

If the calculated RWC is greater than its respective criterion then there is RP and if RWC is less than the criterion then there is no RP.

CMC RP Present:		**CCC RP Present:**	
1Q10 Acute OR	**NO**	**7Q10 Chronic OR**	**NO**
1B3 Acute	**NO**	**4B3 Chronic**	**NO**

The North Dakota State Water Quality Standards (WQS) Chapter 33-16-02.1 use biologically based design and harmonic mean flows to determine Water Quality Based Effluent Limits (WQBELs) and Whole Effluent Toxicity (WET) limits.

Selenium

The RP determination for total selenium in Outfall 002 is provided below. The determination was conducted utilizing the Technical Support Document For Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991 (TSD; March 1991).

The data set for the RP analysis included four samples of the effluent and all available data (1974-1982) from USGS Monitoring Station 06330000-Missouri River near Williston, ND. A default coefficient of variation (CV) of 0.6 was used since less than ten samples were included in the data set. The statistical multiplier based on the 95th percentile occurrence probability was 2.6. The upstream concentration used in the RP analysis was 0.001 mg/L. The maximum effluent concentration used in the RP analysis was 0.009 mg/L. Based on the RP analysis, the department found there to be no reasonable potential for total selenium to be above the human health standard.

The RP analysis indicates there is a reasonable potential for selenium to be above the acute and chronic aquatic life standards. However, since the number of samples is less than 10, the background concentration is more than 40 years old, and there are no known sources of selenium to the WRRF, the RP analysis is insufficient at this time.

Receiving Water Concentration (RWC)
Reasonable Potential (RP)
Determination

Technical Support Document (TSD) For Water Quality-based Toxics Control
EPA/505/2-90-001; March 1991

Facility Name:	Williston	Receiving Stream:	Secondary Channel Missouri River
NDPDES Permit:	ND0022349	1Q10 Acute	0 cfs
Daily Maximum Flow (mgd):	6.62	1B3 Acute	0 cfs
Daily Average Flow (mgd):	2.40	7Q10 Chronic	0 cfs
Stream Design Mixing:	10.0%	4B3 Chronic	0 cfs
Statistical Multiplier:	2.6		
Upstream Concentration:	0.0010	mg/l	**Parameter:**
Effluent Concetration (max):	0.0090	mg/l	**Selenium, Total, A.L.**

$$RWC = \frac{(StatQeCe)+(Cs(pmf)Qs)}{Qe+(pmf)Qs}$$

Outfall: 002

RWC = Receiving water concentration, the resultant magnitude of concentration in the receiving water after effluent discharge concentration (also known as the in-stream waste concentration)
Stat = Statistical multiplier for effluent parameter (Table 3-1 and 3-2; page 57 of the TSD)
Qe = Effluent Design Flow
Ce = Highest effluent concentration reported.
pmf = Partial mix factor, percent of Qs allowed for mixing by State authority.
Qs = Receiving Water Flow (1Q10 or 1B3 for acute and 7Q10 or 4B3 for chronic)
Cs = Background concentration of the receiving water.

Qe - Acute	6.62	mgd	Qs - 1Q10	0.00	mgd
Qe - Chronic	2.40	mgd	Qs - 1B3	0.00	mgd
Ce	0.0090	mg/l	Qs - 7Q10	0.00	mgd
Cs	0.0010	mg/l	Qs - 4B3	0.00	mgd
Stat	2.60				
pmf	10.0%				

Acute RP			Chronic RP		
RWC - 1Q10	0.0234	mg/l	RWC - 7Q10	0.0234	mg/l
RWC - 1B3	0.0234	mg/l	RWC - 4B3	0.0234	mg/l

Criterion Maximum Concentration (CMC)			Criterion Continuous Concentration (CCC)		
Acute Criterion	0.02	mg/l	Chronic Criterion	0.0050	mg/l

If the calculated RWC is greater than its respective criterion then there is RP and if RWC is less than the criterion then there is no RP.

CMC RP Present:		**CCC RP Present:**	
1Q10 Acute OR	**YES**	**7Q10 Chronic OR**	**YES**
1B3 Acute	**YES**	**4B3 Chronic**	**YES**

The North Dakota State Water Quality Standards (WQS) Chapter 33-16-02.1 use biologically based design and harmonic mean flows to determine Water Quality Based Effluent Limits (WQBELs) and Whole Effluent Toxicity (WET) limits.

Receiving Water Concentration (RWC)
Reasonable Potential (RP)
Determination

Technical Support Document (TSD) For Water Quality-based Toxics Control
EPA/505/2-90-001; March 1991

Facility Name:	Williston	Receiving Stream:	Secondary Channel Missouri River
NDPDES Permit:	ND0022349	1Q10 Acute	0 cfs
Daily Maximum Flow (mgd):	6.62	1B3 Acute	0 cfs
Daily Average Flow (mgd):	2.40	7Q10 Chronic	0 cfs
Stream Design Mixing:	10.0%	4B3 Chronic	0 cfs
Statistical Multiplier:	2.6		
Upstream Concentration:	0.0010 mg/l		**Parameter:**
Effluent Concetration (max):	0.0090 mg/l		**Selenium, Total, H.H.**

$$RWC = \frac{(StatQeCe)+(Cs(pmf)Qs)}{Qe+(pmf)Qs}$$

Outfall: 002

RWC = Receiving water concentration, the resultant magnitude of concentration in the receiving water after effluent discharge concentration (also known as the in-stream waste concentration)
Stat = Statistical multiplier for effluent parameter (Table 3-1 and 3-2; page 57 of the TSD)
Qe = Effluent Design Flow
Ce = Highest effluent concentration reported.
pmf = Partial mix factor, percent of Qs allowed for mixing by State authority.
Qs = Receiving Water Flow (1Q10 or 1B3 for acute and 7Q10 or 4B3 for chronic)
Cs = Background concentration of the receiving water.

Qe - Acute	6.62	mgd	Qs - 1Q10	0.00	mgd
Qe - Chronic	2.40	mgd	Qs - 1B3	0.00	mgd
Ce	0.0090	mg/l	Qs - 7Q10	0.00	mgd
Cs	0.0010	mg/l	Qs - 4B3	0.00	mgd
Stat	2.60				
pmf	10.0%				

Acute RP			Chronic RP		
RWC - 1Q10	0.0234	mg/l	RWC - 7Q10	0.0234	mg/l
RWC - 1B3	0.0234	mg/l	RWC - 4B3	0.0234	mg/l

Criterion Maximum Concentration (CMC)			Criterion Continuous Concentration (CCC)		
Acute Criterion	0.05	mg/l	Chronic Criterion	0.0500	mg/l

If the calculated RWC is greater than its respective criterion then there is RP and if RWC is less than the criterion then there is no RP.

CMC RP Present:		**CCC RP Present:**	
1Q10 Acute OR	**NO**	**7Q10 Chronic OR**	**NO**
1B3 Acute	**NO**	**4B3 Chronic**	**NO**

The North Dakota State Water Quality Standards (WQS) Chapter 33-16-02.1 use biologically based design and harmonic mean flows to determine Water Quality Based Effluent Limits (WQBELs) and Whole Effluent Toxicity (WET) limits.

APPENDIX D – RESPONSE TO COMMENTS

Comments received during the public comment period will be addressed and placed here.