

## STATEMENT OF BASIS

PERMITTEE: Standing Rock MR & I Water Department

FACILITY: Standing Rock Water Treatment Plant

PERMIT NO.: SD-0030996

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LOCATION: Latitude 45.722333° N Longitude 100.486667° W, Standing Rock Indian Reservation, Corson County, South Dakota.

RECEIVING WATERS Fisher Creek and an unnamed tributary to Fisher Creek, a tributary to Oahe Reservoir on the Missouri River

PERMIT TYPE: Minor Industrial, Indian Country, Permit Renewal

OUTFALL LOCATION: Outfall 001  
Latitude 45.719889° N  
Longitude 100.485861° W  
  
Outfall 002  
Latitude 45.722889° N  
Longitude 100.485478° W

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## **Background Information**

This Statement of Basis is for the renewal of the National Pollutant Discharge Elimination System (NPDES) Permit (SD-0030996) for discharges from the Standing Rock Water Treatment Plant (SRWTP). The SRWTP was under construction when the previous Permit was issued in 2011, with a September 30, 2016, expiration date. That Permit was issued to the Standing Rock Rural Water System. The correct name of the tribal organization that is responsible for operating the SRWTP and distributing the finished water is the “Standing Rock MR & I Water Department.” The “MR & I” means municipal, rural, and industrial. The renewal Permit will be issued to the Standing Rock MR & I Water Department (SRMRIWD).

The Permittee’s main office is located in Fort Yates, North Dakota. The SRWTP is situated on the west side of the Missouri River along South Dakota Highway 1806. The SRWTP is approximately 13 miles to the NNW of Mobridge, South Dakota. Attachment A at the end of this Statement of Basis is a map showing the location of the SRWTP in relation to SD Highway 1806 and the Missouri River.

Water is pumped to the SRWTP from Oahe Reservoir on the Missouri River. According to the permit application, when operating at full capacity the plant will be producing an estimated two million gallons per day (mgd) of potable water. According to information on a Bureau of Reclamation web site (<http://www.usbr.gov/arra/project/standing-rock-rural-water-system.html>) the SRWTP has a capacity of three mgd, with the ability to expand to five mgd. According to the SRWTP operator, during the summer of 2016 about 0.7 mgd was produced. The demand for water is seasonal, decreasing during the winter.

The water treatment process includes lime softening and settling; recarbonation and buffering; pre-filtering followed by microfiltration; then the addition of fluoride, chlorine, and ammonia before distribution. Alum (sodium aluminate) may be used in the lime softening and settling treatment process to improve contaminant removal. There are three microfiltration units (skids). A line diagram from the permit application showing the water treatment process and wastewater treatment is shown in Attachment B at the end of this Statement of Basis.

According to the permit application the sources of wastewater from the SRWTP include the following:

1. Softening clarifiers sludge approximately 261,000 gallons per year (gpy);
2. Recarbonation and buffer basins overflow and twice per year cleaning, and maintenance approximately 155,000 gpy;
3. Prefiltering and microfiltration backwash approximately 21,000,000 gpy;
4. Water drained from membrane filter unit (skid) prior to “enhanced flux maintenance” cleaning and “clean-in-place” (CIP) cleaning:
  - a. EMF Drain approximately 420,900 gpy
  - b. CIP Drain approximately 27, 600 gpy;
5. Cleaning wastewater from the microfiltration units:

- a. Enhanced flux maintenance clean approximately 525,210 gpy and
- b. CIP waste approximately 144,000 gpy. The chemicals used in the clean-in-place of the microfiltration units involves the use of first sodium hypochlorite and sodium hydroxide solutions, followed by citric acid and hydrochloric acid solutions.

All of these wastewaters go the settling pond system, which consists of three cells are parallel to each other. Each cell is expected to have an operational capacity of 773,400 gallons. It is the EPA's understanding that all the wastewater goes to the north end of the three cells and the wastewater is routed to one cell at a time until the retention capacity of that cell is reached, then the wastewater is routed to another cell. Discharges from the cells will be the result of overflow (i.e., will not be controlled) and are likely to be intermittent in nature. In the permit application it was estimated that the volume of wastewater to be discharged from the settling pond system to be about 23,000,000 gallons per year less settled sludge and evaporation losses. In order to retain settling capability, sludge must be removed from the cells as necessary. The Permittee has land to the east of the SRWTP, in Section 6, for disposal of sludge from the settling pond system.

The permit application was for two outfalls. Outfall 001 is the discharge from the settling pond system. When a discharge occurs, the wastewater will flow via a buried pipe from the settling pond system to a concrete headwall/outlet structure located to the east of the south end of the three ponds and near Fisher Creek. Based on satellite images, it appears to be approximately 60-70 feet from the outfall structure to Fisher Creek. The discharge would flow across the ground to Fisher Creek.

Outfall 002 is for an overflow of the clear well for the finished water in the SRWTP. There is an alarm system in the clear well to help prevent overflowing the clear well. Any overflow of the clear well would be piped to a concrete headwall/outlet structure located to the east of the SRWTP and about 20-30 feet from an unnamed tributary of Fisher Creek. There would be no treatment of an overflow of the clear well.

Attachment C at the end of this Statement of Basis is a satellite image showing the SRWTP and the location of Outfalls 001 and 002.

According to the permit renewal application there has not been a discharge from either outfall since the SRWTP began operation. The operator of the SRWTP anticipates there may be a discharge from Outfall 001 sometime in 2017 after the planned increase in the number of customers has occurred.

### Effluent Limitations in Current Permit

The effluent limitations in the current permit for Outfalls 001 and 002 and the basis for those effluent limitations are given below in Tables 1 and 2, respectively.

TABLE 1  
EFFLUENT LIMITATIONS FOR OUTFALL 001 AND BASIS FOR LIMITATIONS

| Effluent Characteristic   | Effluent Limitation      |                         | Basis <u>b/</u> |
|---|--------------------------|-------------------------|-----------------|
|   | 30-Day Average <u>a/</u> | Daily Maximum <u>a/</u> |                 |
| Total Suspended Solids, mg/L  | 30                       | 60                      | BPJ             |
| Total Residual Chlorine, mg/L   | N/A                      | 0.019                   | WQS             |
| Aluminum, Total Recoverable, mg/L   | N/A                      | 0.75                    | WQS             |
| The concentration of oil and grease in any single sample shall not exceed 10 mg/L nor shall there be any visible sheen in the receiving water or adjoining shoreline. |                          |                         | BPJ & WQS       |
| The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.   |                          |                         | WQS             |

a/ See Definitions, Part 1.1, for definitions.

b/ BPJ = Technology based limit based on best professional judgement; WQS = Limitation based on protecting water quality

For Outfall 002 there was the requirement that there shall be no discharge except as the result of the overflow of the clear well. Any discharge from Outfall 002 shall be terminated as soon as reasonable and practicable after the Permittee becomes aware of the discharge. There shall be no discharge containing wastewater from the cleaning of the clear well. Any discharge shall meet the numerical effluent limitations given in Table 2.

TABLE 2  
EFFLUENT LIMITATIONS FOR OUTFALL 002 AND BASIS FOR LIMITATIONS

| Effluent Characteristic   | Effluent Limitation      |                         | Basis <u>b/</u> |
|---|--------------------------|-------------------------|-----------------|
|   | 30-Day Average <u>a/</u> | Daily Maximum <u>a/</u> |                 |
| Total Residual Chlorine, mg/L <u>c/</u>   | N/A                      | 0.019 <u>c/</u>         | WQS             |
| The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time. |                          |                         | WQS             |

a/ See Definitions, Part 1.1, for definitions.

b/ BPJ = Technology based limit based on best professional judgement; WQS = Limitation based on protecting water quality.

c/ Effective one year after the effective date of the Permit.

## **Receiving Waters**

The SRWTP is located near the headwaters of Fisher Creek, a stream which flows into Oahe Reservoir on the Missouri River. Any discharge from Outfall 001 would flow a short distance (estimated 60-70 feet) across the land and into Fisher Creek and any discharge from Outfall 002 would flow an estimated 20-30 feet across the ground before going into an unnamed ephemeral tributary to Fisher Creek. The outfall is at least six stream miles from the SRWTP to the point where Fisher Creek flows into Oahe Reservoir on the Missouri River. Based on maps of the area and satellite images, Fisher Creek appears to be an intermittent stream and possibly ephemeral. It is possible that at times, especially during periods of prolonged dry weather, a discharge from Outfall 001 would not get to Oahe Reservoir. Any discharge that occurs from Outfall 002 should be of short duration.

## **Applicable Technology and Water Quality Considerations**

As required by the Section 301 of the CWA, when issuing NPDES permits the EPA must derive technology based effluent limits through evaluating applicable treatment technology standards. When necessary to protect water quality, the EPA must also conduct an evaluation of the water quality criteria and the assimilative capacity for the receiving stream. The results of this evaluation are used to establish water quality based effluent limits to ensure the receiving stream quality and its existing and designated uses are protected.

The Standing Rock Sioux Tribe has not applied to the EPA for treatment as a state (TAS) for authorization to establish its own water quality standards (WQS) that can be approved by the EPA. Furthermore, the Tribe has not developed WQS for the Standing Rock Indian Reservation. Section 101(a)(2) of the Clean Water Act states “it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water to be achieved by July 1, 1983”. To effectuate this Congressional goal in the absence of Tribal water quality standards, the EPA considers the beneficial uses of the receiving waters to include aquatic life and recreation. Satellite images of the area show a small in-stream impoundment on Fisher Creek, approximately 1/4 mile downstream from the discharge from Outfall 001. This indicates that Fisher Creek is used for livestock watering, which also will be considered a beneficial use. The EPA relied on CWA § 301(b)(1)(C) in establishing WQBELs based on EPA’s Section 304(a) recommended water quality criteria to protect these uses in the receiving waters.

## **Technology Based Effluent Limits**

Technology based effluent limitations normally are based on applicable effluent limitations guidelines (ELGs), applicable promulgated effluent limitations (e.g., applicable state effluent limitations), and in the absence of either ELGs or applicable promulgated effluent limitations, best professional judgement (BPJ) as provided for in Section 402(a)(1)(B) of the CWA. Currently, there are no effluent limitations guidelines for discharges from water treatment plants, and there are no applicable promulgated effluent limitations that would apply to the two discharges from this facility. Using BPJ, technology based effluent limitations were derived for two pollutants of concern in the discharge from Outfall 001: TSS and oil and grease. The use of properly maintained settling ponds will provide good removal of suspended solids. Therefore, as in the previous permit, total suspended solids (TSS) will have a 30-day average limitation of 30 mg/L and a daily maximum limitation of 60 mg/L. The EPA Region 8 has used a technology based limitation of 10 mg/L on oil and grease with no visible sheen based on BPJ for many years.

### **Water Quality Based Effluent Limits**

There are no pollutants of concern in the discharges from Outfalls 001 and 002 for recreation or livestock watering. The discharge should not cause water quality problems for these uses of the receiving waters. In terms of fresh water aquatic life, the pollutants of potential concern include pH, total residual chlorine (TRC), ammonia nitrogen and aluminum. Because the discharges will be intermittent in nature, only the acute criteria will be considered.

Any discharge from Outfalls 001 and 002 will need to meet a pH limitation. For pH, a technology based limitation of a minimum of 6.0 and a maximum of 9.0 is widely used in NPDES permit effluent limitations. The water quality criterion for pH for warm water aquatic life is 6.5 to 9.0. Since the 6.5 to 9.0 limitation is more restrictive, that limitation will be used in the renewal permit for both outfalls as was done in the previous permit.

Chlorine is likely to be present in discharges from both Outfalls 001 and 002. The acute criterion for TRC is 0.019 mg/L. The chlorine concentration in discharges from Outfall 1 is likely, but not certain, to decay in the settling pond system sufficiently to meet the acute TRC criterion. The chlorine concentrations in discharges from Outfall 002 most likely will exceed the acute TRC criterion of 0.019 mg/L if there were to be a discharge. The average concentration of TRC in the clear well is in the 2-3 mg/L range, more than 100 times the water quality criterion of 0.019 mg/L. As a result, both outfalls will have a TRC limitation of 0.019 mg/L.

Ammonia is not likely to be present in the discharges from Outfall 001 since the water used for backwashing the filter and microfiltration systems is obtained prior to the addition of ammonia. Ammonia is likely to be present in any discharges from Outfall 002 due to the addition of ammonia to the water at the clear well prior to the water going to the distribution system. The EPA's latest acute criterion for ammonia nitrogen is dependent on pH and temperature (78 FR 52192, "Final Aquatic Life Ambient Water Quality Criteria for Ammonia-Freshwater" 2013). Operational data for the SRWTP, from August 24, 2015, to present, show that the pH of the water in the clear well often exceeds 9.0 and the temperature is as high as 71° F (21.7° C). For a pH of 9.0 and a temperature of 22° C, the EPA's recommended acute criterion is 0.52 mg/L of total ammonia (as N). That value is from Table 5b of the EPA's 2013 *Aquatic Life Ambient Water Quality Criteria for Ammonia-Freshwater 2013*, EPA 822-R-13-001, April 2013. Ammonia concentrations in discharges from Outfall 002 has the reasonable potential to exceed this acute criterion. As a result, Outfall 002 will have an ammonia limitation of 0.52 mg/L.

The fresh water aquatic life acute criterion for aluminum is 0.75 mg/L. Aluminum is likely to be present in the discharge from Outfall 001 due to the use of alum in the treatment process. However, it is not known if it will be present in the discharges from Outfall 002 in sufficient concentrations to have reasonable potential to exceed the 0.75 mg/L criterion. Outfall 001 will have an aluminum limitation of 0.75 mg/L. Additional monitoring will be required for discharges from Outfall 002, should they occur.

The State of South Dakota has classified the Missouri River from Big Bend Dam to the North Dakota border for (1) domestic water supply waters, (2) cold water permanent fish life propagation waters, (7) immersion recreation waters, limited-contact recreation waters, and (11) commerce and industry waters. It is highly unlikely the pollutants from the two discharges would make it to the Missouri River in

concentrations and quantities great enough to have a measurable effect on water quality. No effluent limitations are required to protect these downstream waters.

### **Proposed Effluent Limitations**

Based on the foregoing discussion, the proposed limitations and the basis for the limitations are given in the following table.

OUTFALL 001

| Effluent Characteristic   | Effluent Limitation      |                         | Basis <u>b/</u> |
|---|--------------------------|-------------------------|-----------------|
|   | 30-Day Average <u>a/</u> | Daily Maximum <u>a/</u> |                 |
| Total Suspended Solids, mg/L  | 30                       | 60                      | BPJ             |
| Total Residual Chlorine, mg/L   | N/A                      | 0.019                   | PWQ             |
| Aluminum, Total Recoverable, mg/L   | N/A                      | 0.75                    | PWQ             |
| The concentration of oil and grease in any single sample shall not exceed 10 mg/L nor shall there be any visible sheen in the receiving water or adjoining shoreline. |                          |                         | BPJ & PWQ       |
| The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.   |                          |                         | PWQ             |

a/ See Definitions, Part 1.1, for definitions.

b/ BPJ = Technology based limit based on best professional judgement; PWQ = Limitation based on protecting water quality.

OUTFALL 002

| Effluent Characteristic   | Effluent Limitation      |                         | Basis <u>b/</u> |
|---|--------------------------|-------------------------|-----------------|
|   | 30-Day Average <u>a/</u> | Daily Maximum <u>a/</u> |                 |
| Total Residual Chlorine, mg/L   | N/A                      | 0.019                   | PWQ             |
| Total Ammonia as N, mg/L  | N/A                      | 0.52                    | PWQ             |
| The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time. |                          |                         | PWQ             |

a/ See Definitions, Part 1.1, for definitions.

b/ BPJ = Technology based limit based on best professional judgement; PWQ = Limitation based on protecting water quality.

In addition to the numerical effluent limitations for Outfall 002, the renewal Permit will require that there shall be no discharge from Outfall 002 except as the result of the overflow of the clear well. Any discharge from Outfall 002 shall be terminated as soon as reasonable and practicable after the Permittee becomes aware of the discharge. In addition, there shall be no discharge containing wastewater from the cleaning of the clear well.



The water level alarm system in the clear well is an attempt to avoid having a discharge from Outfall 002. If discharges start occurring, it may be necessary for the Permittee to consider such options as constructing a containment pond at the end of Outfall 002 or routing any discharge from Outfall 002 to the settling ponds on the other side of the SRWTP.

### **Self-Monitoring Requirements**

The self-monitoring requirements in the renewal Permit are similar to those of the previous Permit and are given in Part 1.3.2 of the Permit. Quarterly monitoring for total nitrogen and total phosphorus have been added to the monitoring requirements for Outfall 001 in order to obtain an idea of the amount of nutrients being discharged. This monitoring is not being required for Outfall 002 because what discharges that may occur should be seldom and of very short duration.

The Permittee is expected to be able to monitor the rates of discharge from Outfall 001 with reasonable accuracy (+ or - 10%). Although there presently are no flow measuring capabilities in place, the Permittee has had more than ample time to make the necessary arrangements for measuring the rates of discharge from Outfall 001.

The special monitoring requirements for Outfall 001 given in Part 1.3.2.3 has been modified to start the monitoring after the first discharge begins and to be continued for 18 months. The purpose of this monitoring is to determine the effluent concentrations of total ammonia and to determine if the discharge presents a water quality problem in terms of ammonia toxicity to aquatic life. In addition to ammonia, the permittee will have to monitor temperature and pH of the discharge at essentially the same time the ammonia samples are taken.

For Outfall 002 the self-monitoring requirements have been modified by adding total ammonia (as N) to the list of effluent characteristics to be monitored. The frequency of monitoring for pH and total residual chlorine has been changed from weekly to daily because the duration of any discharges is expected to be very short. The flow monitoring requirements for Outfall 002 will be essentially the same as in the previous Permit. What discharges actually occur should be infrequent and of short duration. This would make it difficult for the Permittee to obtain actual flow measurements. A reasonable estimate of the volume of water discharged from Outfall 002 can be obtained from the duration of the discharge and the rates of flow into the clear well. Ideally, there will never be a discharge from Outfall 002.

### **Reporting of Self-Monitoring Requirements and Other Reports**

On October 22, 2015, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule was published in the *Federal Register* (80 FR 64064). The rule became effective on December 21, 2015, and involves two phases. Phase 1 includes the requirement that by no later than December 21, 2016, entities that are required to submit DMRs must do so electronically unless a waiver from electronic reporting is granted to the entity. Phase 2 includes the requirement that by no later than December 21, 2020, other specified reporting must be done electronically.

Since the renewal Permit will not be issued and effective prior to December 21, 2016, the Permittee must electronically report DMRs using NetDMR. Electronic submissions by Permittees must be sent to EPA Region 8 **no later than the 28th of the month following the completed calendar quarter**. The

Permittee must sign and certify all electronic submissions in accordance with the requirements of Part 4.7 of this Permit (“Signatory Requirements”). NetDMR is accessed from the internet at <https://netdmr.zendesk.com/home>.

The results from the special monitoring required in Part 1.3.2.3 of this Permit shall be tabulated in a Word or PDF document and attached to the NetDMR for that reporting quarter.

The reports that are to be submitted electronically after December 21, 2020, are to be submitted using “NeT”. The instructions on how to use “NeT” are not yet available. The Permittee will in the future receive instructions on how to use “NeT”. Until then, the Permittee shall continue to submit any other reports (e.g., Parts 2.8 and 2.9) in paper format and mailing them to the specified addresses.

### **Biological Evaluation for the Endangered Species Act (ESA) Requirements**

Section 7(a) of the Endangered Species Act requires federal agencies to insure that any actions authorized, funded, or carried out by an agency are not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or adversely modify or destroy critical habitat of such species. As of September 26, 2016, the federally listed threatened (T) and endangered (E) species listed on the U. S. Fish and Wildlife Service’s (USFWS) web site for “Information for Planning and Conservation (IPAC) in the area of the SRWTP and the area affected by possible discharges from Outfalls 001 and 002 consisted of the following:

| <b><u>Group</u></b> | <b><u>Common Name and Species</u></b>                           | <b><u>Status</u></b> |
|---------------------|---|----------------------|
| Birds               | Least Tern (interior population) ( <i>Sternula antillarum</i> ) | E                    |
| Birds               | Piping Plover ( <i>Charadrius melodus</i> )                     | T                    |
| Birds               | Red Knot ( <i>Calidris canutus rufa</i> )                       | T                    |
| Birds               | Whooping Crane ( <i>Grus americana</i> )                        | E                    |
| Fishes              | Pallid Sturgeon ( <i>Scaphirhynchus albus</i> )                 | E                    |
| Mammals             | Northern Long-eared Bat ( <i>Myotis septentrionalis</i> )       | T                    |

In addition, one critical habitat was listed on the web site for the affected area. The USFWS has designated critical habitat for the northern Great Plains breeding population of the piping plover (67 FR 57638). According to the designation, “Critical habitat includes prairie alkali wetlands and surrounding shoreline, including 200 feet (ft) (61 meters (m)) of uplands above the high water mark; river channels and associated sandbars, and islands; reservoirs and their sparsely vegetated shorelines, peninsulas, and islands; and inland lakes and their sparsely vegetated shorelines and peninsulas.” The designation of critical habitat was done by township, range, and section descriptions. In South Dakota it appears that all of the shoreline along Lake Oahe is included as critical habitat. The middle and upper portions of the Fisher Creek drainage are not in the area designated as critical habitat. Where Fisher Creek flows into an arm of Lake Oahe (Mooquit Valley) has been designated as critical habitat, as is most of the shoreline of Lake Oahe.

For the reasons given below, the EPA finds that reissuance of this NPDES Permit (SD-0030996) for the Standing Rock Water Treatment Plant is Not Likely to Adversely Affect any of the species listed as threatened or endangered for Corson County by the U.S. Fish and Wildlife Service under the Endangered Species Act nor their critical habitat.

1. The discharges authorized by this Permit would only affect water quality in the Fisher Creek drainage and a very small portion of the Missouri River.
2. The permit requirements are protective of water quality.
3. The only fish in the above list is the Pallid sturgeon, which is found in the Missouri River. Between the extensive amount of dilution provided by the Missouri River and the effluent requirements of the Permit, the potential discharges would not have a measurable impact on water quality in the Missouri River.
4. The permit requirements do not necessitate any construction activities in areas designated as critical habitat.

Note: Before going to public notice, a copy of the draft Permit and this Statement of Basis was sent to the USFWS requesting concurrence with the EPA's finding that reissuance of this NPDES Permit (SD-0030996) for the Standing Rock Water Treatment Plant is Not Likely to Adversely Affect any of the species listed as threatened or endangered for Corson County by the USFWS under the Endangered Species Act nor their critical habitat. On October 31, 2016, the USFWS concurred with the EPA's conclusion that the described project will not adversely affect listed species.

#### **National Historic Preservation Act (NHPA) Requirements**

Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. The EPA has evaluated its planned reissuance of the NPDES Permit for the Standing Rock Water Treatment Plant to assess this action's potential effects on any listed or eligible historic properties or cultural resources. There are no historic properties listed in the immediate vicinity of the SRWTP nor in the area affected by possible discharges from the SRWTP. The EPA does not anticipate any impacts on listed/eligible historic properties or cultural resources because this Permit is a renewal and will not be associated with any new ground disturbance or significant changes to the volume of discharges nor any new points of discharge (i.e. Outfalls). During public notice the EPA contacted the tribal historic preservation office (THPO) seeking comments on the possible adverse effects this Permit may have on historic properties and/or cultural resources in the area.

#### **Response to Comments**

No Comments were received during public notice.

#### **Miscellaneous**

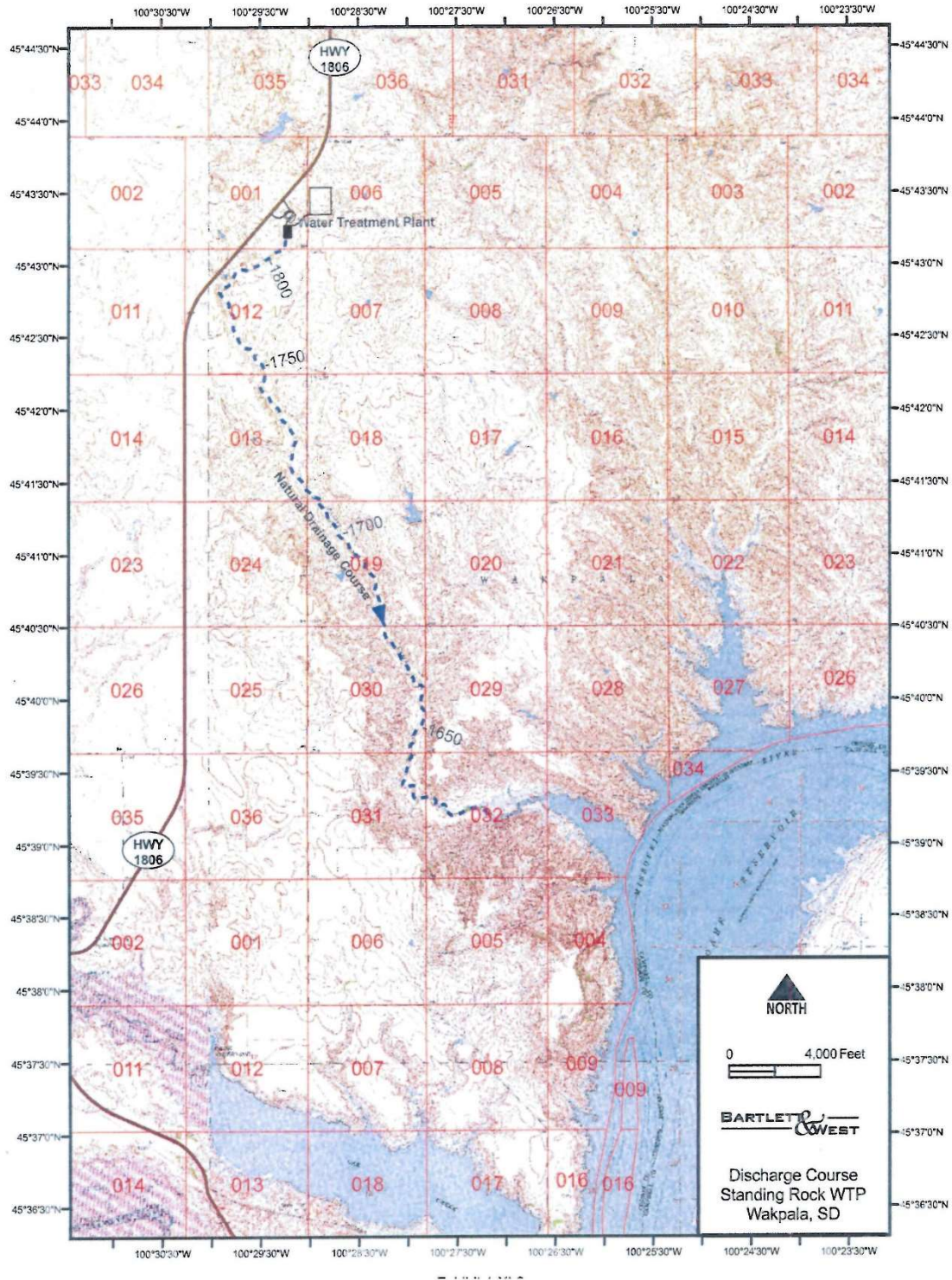
The renewal Permit will be issued for approximately five years, with the effective date and the expiration date of the Permit determined at the time of issuance of the Permit, but not to exceed five years.

Permit drafted by Bob Shankland SEE, 8WP-CWW, EPA Region 8 October 17, 2016

Permit Revised by Paul Garrison Environmental Engineer, EPA Region 8, October 24, 2017

ATTACHMENT A

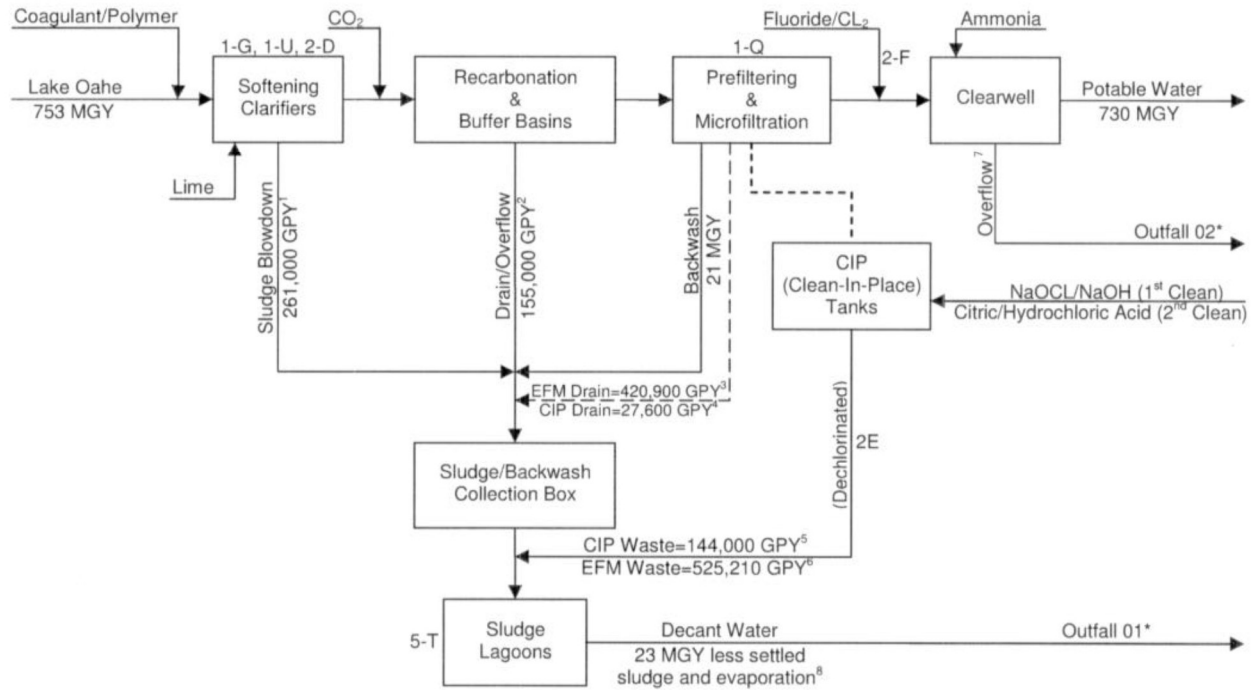
Map Showing Location of SRWTP in Relation to SD Highway 1806 and the Missouri River



## ATTACHMENT B

### Line Diagram of Water Treatment Process and Wastewater Treatment from the 2010 Permit Application

#### LINE DRAWING



<sup>1</sup> Estimated sludge production at 1.5mgd (yearly average) = 6,880.5 lb/day. Assumed 25% semi-solid.

<sup>2</sup> Assumes 0 gal/yr for overflow and MF buffer/recarbonation basins drained twice per year for cleaning, inspection, and maintenance.

<sup>3</sup> Prior to an "enhanced flux maintenance" clean (EFM), water is drained from the membrane skid resulting in 1,150 gal per skid per clean. EFM's are estimated to be performed every 3 days or 122 times per year.

<sup>4</sup> Prior to a "clean-in-place" (CIP), water is also drained as above. CIP's are estimated to be performed every 45 days or 8 times per year.

<sup>5</sup> CIP's (clean-in-place) are estimated to be performed 8 times per year per skid and consist of cleaning solution and flush water.

<sup>6</sup> EFM's (enhanced flux maintenance clean) are estimated to be performed 122 times per year per skid and consist of cleaning solution and flush water.

<sup>7</sup> Overflow of potable water from clearwell will occur primarily during initial startup testing and only infrequently thereafter. Quantities unknown and anticipated to be negligible.

<sup>8</sup> The 23 MGY is based on anticipated year-round average with backwash water being the major constituent. Approximately 7-9 MG of this total are anticipated to be discharged during the summer months.

\*Outfalls discharge into an unnamed intermittent stream approximately 6.6 miles upstream from "Waters of the U.S." (Lake Oahe).



**ATTACHMENT C**

Satellite Image of SRWTP and Outfall 001 and Outfall 002

