UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15th STREET, SUITE 3200
HELENA, MONTANA 59626

STATEMENT OF BASIS

PERMITTEE	United States Department of the Interior Bureau of Indian Affairs Crow Reservation
FACILITY	Crow Agency Water Treatment Plants: • BIA Water Treatment Plant • Crow Tribe Water Treatment Plant
CONTACT	Leroy Cummins, Facilities Manager Bureau of Indian Affairs - Crow Agency P.O. Box 69 Crow Agency, MT 59022
PERMIT NO.	MT0030538
RECEIVING WATERS	Little Bighorn River
LOCATION	SE ¼ SE ¼ SW ¼ of Section 1, Township 3S, Range 34E 45° 35' 39" N Latitude 107° 27' 52" W Longitude
POPULATION	1,616 (2010 Census)
PERMIT TYPE	Minor, Reissue of Expired Permit

A. Facility Description

This Statement of Basis is for the renewal of the National Pollutant Discharge Elimination System (NPDES) permit for the discharge from Crow Agency's two Water Treatment Plants (WTPs). The NPDES discharge permit was most recently reissued to the BIA effective September 1, 2006 and expired August 31, 2011. The WTPs are located within the boundaries of the Crow Reservation, in a single building on the west bank of the Little Bighorn River just upstream of the diversion to the Agency canal. One of the WTPs is owned and operated by the Crow Tribe with the other being owned and operated by the USDOI-BIA. The Crow Tribal WTP was not operating when the previous permit was issued but went into operation during the permit effective period. As backwash water from both WTPs is mingled prior to discharge, one permit is being developed to cover the discharge from both WTPs. The permit will be issued to the BIA who is the party responsible for collection of water and wastewater fees and who has historically conducted discharge monitoring. EPA is re-issuing this permit pursuant to the Agency's authority to implement the Clean Water Act NPDES program in Indian Country.

Each of the WTPs has its own intake pipe to draw raw water from the Little Bighorn River. Raw water is primarily treated with aluminum sulfate for coagulation of suspended solids with addition of polymer as needed to address extreme turbidity or to increase filter efficiency. Water passes through a static mixer immediately after chemical addition, From there it goes to a clarifying tank where larger coagulated solids settle. The sludge layer from the clarifying tanks in both WPTs is disposed through a single wet well to outside settling ponds as described below. After treatment in the clarifying tank water is sent through multi-media filters, removing the last suspended particles. The BIA WTP has two filters while the Crow Tribal plant has one filter. Filtering is followed by chlorination with sodium hypochlorite at the BIA plant and gaseous chlorine at the Crow Tribal plant. Water from the two plants comes together in the clear well from which it is pumped to distribution. Treatment filters are backwashed every 24 hours or as needed with backwash water from both WPTs going to the single wet well and then to the settling ponds. On average about 26,000 gallons per day are discharged into the settling pond with the maximum daily flow being 54,000 gallons. The settling pond consists of two cells. Heavy particulate and suspended solids settle within the primary cell. Supernatant from the primary cell flows through a pipe into the secondary settling cell for additional settling. A continuous discharge from the secondary cell flows over a weir into a pipe and then approximately 60 feet to the Little Bighorn River. The last recorded removal of settled solids from the ponds was in 2001. The settling ponds are about five feet deep; the July 2013 facility inspection showed both settling pond cells very full with aquatic plants growing in them because of the deep layer of sediment.

B. Receiving Waters

The WTPs' discharge is on the east side of the secondary pond into a pipe leading to the Little Bighorn River at approximately 45° 35' 39" north latitude and 107° 27' 52" west longitude.

C. Previous Discharge Limits

Effluent Characteristic	30-Day Average	Daily Maximum
Total Suspended Solids, mg/L	30	45
Total Dissolved Aluminum, mg/L	1.0	1.5
Total Residual Chloride, mg/L	N/A	0.5
The pH of the discharge shall not be less than 6.0 or greater than 9.0 at any time.		
There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge which causes a visible oil sheen in the receiving water.		

D. Past Discharge Data

The discharge data below represents self monitoring data for the period from July 2008 through July 2013.

	pH Min - Max S.U.	TSS 30-Day Ave. mg/L	Dissolved Aluminum, mg/L	Total Residual Chlorine, mg/L
Range	6.9 - 8.2	10.0 – 394.0	0.07 – 14.5	0 – 0
Average	7.8	59.6	0.63	0
Permit Limit	6.0 - 9.0	30	1.0	0.5
# Exceedences	0	25 of 60 samples	2 of 60 samples	0

Over the past 5 years, the 30-Day TSS effluent standard of 30 mg/L has been exceeded 25 times with exceedences up to 394 mg/l, or about 13 times the 30-Day average effluent limit for TSS. This is an extreme increase over the 4 fold increase above the effluent limit noted in the December 2006 Statement of Basis. During the July 8, 2013 inspection, the inspector noted high sediment levels in both cells of the sedimentation ponds. The operators of the plants said the last pond cleaning was about 2001. The 2006 statement of basis also mentions the need to clean the sedimentation ponds, which evidently was not done during the last permit period. These high sediment levels, which cause a faster flow through the ponds and less time for settling, are probably the main cause of the high TSS effluent results. Cleaning the sedimentation ponds needs to be done as soon as possible and be scheduled to recur on a regular basis. The renewal permit will contain a requirement to clean the sediment ponds within three months of the permit effective date and contain interim reporting dates between the effective date and the cleaning deadline.

E. Water Quality Considerations

The Little Bighorn River flows into the Bighorn River, at a point within the Reservation boundaries, approximately 12 miles downstream from the discharge. The Crow Tribe does not have water quality standards but they do have draft designated uses for this portion of the River. The draft designated uses for the River downstream of the discharge are non-Salmonid marginal propagation, full contact recreation, and agricultural and industrial use. EPA has not approved these designated uses.

For the designated uses of the Little Bighorn River, aquatic life could be adversely affected by the aluminum and total residual chlorine (TRC) in the discharge from the backwash ponds. EPA's recommended aquatic life criteria for aluminum (as total recoverable aluminum) are 750 µg/l (0.750 mg/l) for acute toxicity and 87 µg/l (0.087 mg/l) for chronic toxicity. The recommended national water quality criterion is 19 µg/l (0.019 mg/l) TRC for acute toxicity and 11 µg/l (0.011 mg/l) TRC for chronic toxicity.

The nearest USGS gauging stations are located on the Little Bighorn River upstream and downstream from the discharge.

Station Description	USGS Number	Approximate Distance From Discharge	Period of Record	7Q10
Little Bighorn River near Wyola	06294000	32 miles upstream	1939-2005	14 cfs
Little Bighorn River near Hardin	06289000	12 miles downstream	1954-2005	32 cfs

For minor facilities having a dilution ratio $\geq$ 50:1 and where allowing dilution would pose insignificant environmental risks, the Region 8 Mixing Zone and Dilution Policy, updated September, 1995, provides for the use of complete mix in determining acute and chronic toxicity based effluent limitations. For purposes of determining if aluminum and TRC in the discharge from the backwash ponds are toxic it was assumed that there was a 7Q10 flow of 14 cfs in the Little Bighorn River at the point of discharge. The 14 cfs is used as the 7Q10 because the because the 7Q10 from the Wyola station provides for a more conservative analysis. The maximum rate of discharge from the ponds was 0.2 mgd or 0.31 cfs. It is assumed the background concentration of TRC and aluminum is zero (0) as there are no known sources of chlorine located upstream of the point of discharge and no data available for the concentration of total aluminum in the Little Bighorn River.

The following mass balance equation is used to calculate the effluent concentration of a discharged pollutant that would cause the concentration of that pollutant in the receiving body downstream of the discharge to reach the concentration where it exceeds the water quality criteria:

$$C_d = \frac{C_r Q_r - C_s Q_s}{Q_d}$$

Where:

Q_d = Discharge flow from the facility, the maximum recorded flow is 0.31 cfs.

C_d = Calulated discharge concentration of each pollutant in mg/l.

Q_s = Upstream river flow available for dilution, 14 cfs as listed above.

C_s = Upstream concentration of each pollutant, zero (0) mg/l for both Al and TRC as described above.

Q_r = Downstream river flow, including the discharge flow, 14.31 cfs (Q_d+Q_s = 0.31+14).

C_r = Downstream pollutant concentration in the river not to be exceeded in mg/l, this variable uses the acute and chronic levels for each pollutant listed above.

Using the above equation, an assumption of complete mixing of the discharge, and the assumptions given above, the equation is:

$$C_d = \frac{C_rQ_r - C_sQ_s}{Q_d} = \frac{(C_r \bullet 14.31) - (0 \bullet 14)}{0.31}$$

Where the following values, converted to mg/l, are successively used as the C_r variable to determine each effluent limitation.

Pollutant	Acute Criteria	Chronic Criteria
Aluminum	750 µg/l	87 µg/l
TRC	19 µg/l	11 µg/l

When calculated as described above, the effluent concentrations for meeting the acute and chronic water criteria for aluminum and TRC are given below:

Basis for the effluent concentration	Calculated Effluent concentration in mg/l
Aluminum, acute	34.6
Aluminum, chronic	4.0
TRC, acute	0.88
TRC, chronic	0.51

Based on the results of the above calculations, the discharge should not cause water quality problems if the effluent pollutant levels are lower than the calculated effluent concentrations.

F. Effluent Limitations

There are no effluent limitation guidelines that apply to the discharges covered by this permit. Accordingly, the technology based effluent limitations are based on best professional judgment (BPJ) as provided for in Section 402(a)(1) of the Clean Water Act and as used in the previous permit. Based upon the analysis using EPA's National Water Quality Criteria values for each pollutant calculated in Part E above, the effluent limitations below should be protective of the Tribe's downstream designated uses. The effluent limitations and the basis for the limitations are given in the table below for Outfall 001. These limitations are the same as those in the previous permit, except Total Dissolved Aluminum has been replaced with Total Recoverable Aluminum to accurately reflect the EPA criteria.

Effluent Characteristic	30-Day Average	Daily Maximum	Basis a/
Total Suspended Solids, mg/L	30	45	Prev. Permit, 40 CFR § 133.102(b)
Total Recoverable Aluminum, mg/L	1.0	1.5	Prev. Permit, BPJ effluent concentration calculations above
Total Residual Chloride, mg/L	N/A	0.5	Prev. Permit, BPJ effluent concentration calculations above

The pH of the discharge shall not be less than 6.0 or greater than 9.0 at any time.	Prev. Permit, 40 CFR § 133.102(c)
There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge which causes a visible oil sheen in the receiving water.	Prev. Permit, BPJ, 40 CFR § 110.3

a/ "Previous Permit" refers to limitations in the previous permit. The NPDES regulations (40 CFR §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 §122.62. BPJ means best professional judgment.

G. Self-Monitoring Requirements

The following samples shall be taken from the outlet weir pipe after the secondary pond and prior to discharge to the river.

Effluent Characteristic	Frequency	Sample Type a/
Total flow, gpm b/	Monthly	Instantaneous
Total Suspended Solids, mg/L	Monthly	Grab
Total Recoverable Aluminum, mg/L	Monthly	Grab
pH, s.u.	Monthly	Grab or Instantaneous
Total Residual Chlorine, mg/L c/	Monthly	Grab or Instantaneous

a/ See Definitions, Part I.A. of the permit for definition of terms.

b/ Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate during the reporting period and the maximum flow shall be reported**.**

c/ The analytical method used for Total Residual Chlorine must have a minimum detection level of 0.2 mg/L or less.

H. Inspection Requirements

Part 1.3.3 of the permit requires the permittee to do weekly inspections of the filter backwash ponds. The inspection requirements include checking to see if a discharge is occurring, checking for leaks in the dikes, dike erosion, indications of animals burrowing in the dikes, and rooted plants growing in the ponds. Inspections may be delayed if weather conditions (e.g. lightening, icy footing, etc.) make it dangerous to conduct the inspection.

In addition to weekly inspections, the permittee is required to implement Best Management Practices (BMPs) to prevent excess sediment levels in the filter backwash ponds. The purpose of the BMPs are to keep the ponds from becoming too full of sediment and thus reduce their treatment efficiency to the point that the effluent limitations will not be met. The BMPs consist of sediment depth measurements, which are to be taken three times a year (in March-April, June-August, and October-November). After the measurements are taken, the permittee is to make a determination if sediment should be removed from the filter backwash pond(s) before the next measurements are due to be taken. The filter backwash ponds should not be allowed to fill more than two-thirds ($^2/_3$) with sediment before sediment removal is done. Measurements in a filter backwash pond do not have to be taken if the sediment has been removed from that pond within the previous 45 days.

I. Total Maximum Daily Loads

On June 21, 2000 and September 21, 2000, U.S. District Judge Donald W. Molloy issued orders stating that until all necessary total maximum daily loads (TMDLs) under Section 303(d) of the Clean Water Act are established for a particular water quality limited segment, the EPA is prohibited from issuing new permits or from increasing already permitted discharges under the NPDES program. (The orders were issued pursuant to the lawsuit Friends of the Wild Swan, et al., v. U.S. EPA, CV 97-35-M-DWM, District of Montana, Missoula Division.)

EPA finds that the issuance of this permit would not conflict with the order because (1) this is not a permit for a new or increased source and (2) the receiving water is in Indian County. Furthermore, when EPA approved the State of Montana's 1996 and 1998 lists of impaired streams and lakes which included water bodies within tribal reservation boundaries, EPA specifically stated that the approval did not extend to waters within Indian County. The Crow Tribe has not adopted WQS and have not listed water bodies as impaired and developed a 303(d) list to require development of TMDLs. If a future load allocation is set for any parameter which could apply to the BIA WTPS, the permit contains a provision that would allow the permit to be reopened and modified to include any Waste Load Allocation developed and approved by the Crow Tribe and/or EPA.

J. Endangered Species Act Requirements

Section 7(a) [16 U.S.C. §1536(a)(2)] of the Endangered Species Act requires federal agencies to ensure 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. According to the U.S. Fish and Wildlife Service, Montana Field Office, internet site at http://www.fws.gov/mountain-prairie/mt.html, Table 3 lists the federally listed threatened, endangered and candidate species and proposed and designated critical habitat found on the Crow Reservation in Montana.

Table 3: Threatened, Endangered, and Candidate Species on the Crow Reservation

Common Name	Scientific Name	Status	Habitat
Black-footed Ferret	*Mustela nigripes*	Endangered	Prairie dog complexes; Eastern Montana
Greater sagegrouse	*Centrocercus urophasianus*	Candidate	Eastern, central and southwestern Montana in sagebrush, sagebrush-grasslands, and associated agricultural lands

Sprague's Pipit	*Anthus spragueii*	Candidate	Grassland habitats with little or no shrub cover east of the Continental Divide

EPA finds this permit is Not Likely to Adversely Affect any of the species listed by the US Fish and Wildlife Service under the Endangered Species Act. The finding is based upon the following: (1) the renewed permit is for an existing facility; (2) the renewal of this permit does not allow for any increase in effluent limitations over the previous permit; (3) The facility does not provide any habitat for any of the endangered, threatened, or candidate species listed in Table 3; and (4) effluent limits are protective of water quality.

K. National Historic Preservation Act (NHPS) 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. EPA has evaluated its planned reissuance of the NPDES permit for the WTP to assess this action's potential effects on any listed/eligible historic properties or cultural resources. 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 changes to the volume or point of discharge.

L. Miscellaneous

The effective date of the permit and the permit expiration date will be determined at the time of issuance. The permit will be issued for a period of approximately, but not longer than five years.

Statement of Basis prepared by David Rise, Region 8 EPA, Montana Office; August 27 2013
Modified by David Rise; November 20,2013
Modified by David Rise; December 16, 2013