

STATEMENT OF BASIS

PERMITTEE: City of Wagner
FACILITY: City of Wagner Wastewater Treatment Plant (Lagoon)
PERMIT NO: SD-0020184
FACILITY CONTACT: Mike Jansen, Water Superintendent
City of Wagner
60 South Main
P.O. Box 40
Wagner, South Dakota 57380-0040
(605) 384-3741

PERMIT TYPE: Minor Municipal Wastewater Treatment Plant (Renewal)

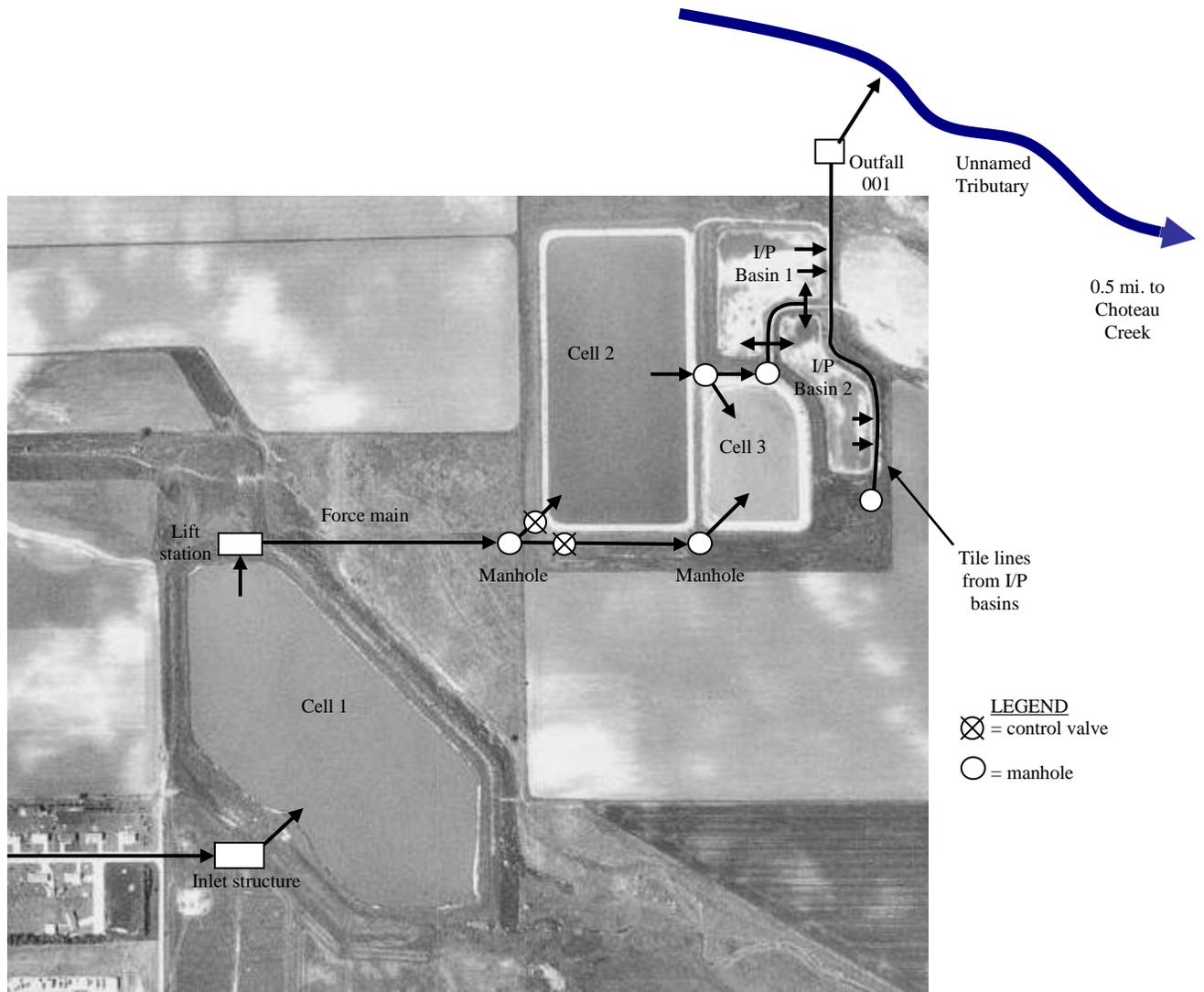
Background Information

This City of Wagner permit is again being renewed as an individual permit rather than be included under the general permit for wastewater lagoon systems in Indian Country in South Dakota (SDG589####) because the facility is not listed in Appendix A of the general permit. In the past there have been jurisdictional issues concerning who has the authority to issue the permit. This facility is located within the exterior boundaries of the Yankton Sioux Tribe Reservation. Recent information depicts the discharge point being located on "Allotted Lands", which means it is located in Indian country and therefore, the Environmental Protection Agency is the permitting authority.

The wastewater treatment facility serving the City of Wagner, population 1675, plus 500 from the Yankton Sioux Tribe, is located approximately ¼ mile northeast of the city in Charles Mix County, South Dakota in the Northeast ¼ of Section 34, Township 96 North, Range 63 West. The facility discharge point is located at latitude 43° 05' 28" N, longitude 98° 16' 26" W. This facility is located within the exterior boundaries of the Yankton Sioux Tribe Reservation.

The facility consists of three waste stabilization ponds and two infiltration/percolation (I/P) basins. Refer to the following site schematic for the treatment facility layout. Sewage flows by gravity to cell #1 (20.4 acres), then a lift station pumps the wastewater to cell #2 (13.2 acres) or cell #3 (4.4 acres). Cells #2 and #3 can be operated in series or parallel. Wastewater is then conveyed to either of the two I/P basins (2.9 and 2.05 acres). The cells have valve controlled interpond piping to the I/P basins which are underdrained with gravity flow to the discharge area located about 100 feet from the NE corner of the northeast I/P basin. Flow measurement at the discharge point is accomplished with a v-notch weir. The last upgrade in 1989 included cell #3 and the two I/P basins. The facility discharges continuously even when not using the I/P basins for wastewater treatment, due to high groundwater being intercepted by the I/P basins piping collection system. There are no known industrial users to the system.

City of Wagner Wastewater Treatment Facility Site Schematic



Receiving Waters

The discharge from this facility enters an unnamed tributary northeast of the treatment facility and then flows approximately 0.5 mile to Choteau Creek. Choteau Creek joins numerous other creeks within the Missouri River Basin Watershed, until its confluence with the Missouri River at the South Dakota/Nebraska border.

Monitoring Data

Monitoring data for this facility is compiled from the Data Monitoring Report (DMR) information received from the permittee and is presented in Attachment 1 at the end of this statement of basis. The data covers the period of January 2006 through December 2010. Follow up information was provided by the treatment plant's operator via telephone. Based on the limited data received from the facility, the available maximum and minimum values over the last 5 years are reported below:

<u>Parameter</u>	<u>Minimum</u>	<u>Maximum</u>
Flow, mgd	0.155	1.64
BOD5, mg/L	3	25
TSS, mg/L	5	28
Ammonia - N, mg/L	0.07	1.98
pH	6.9	8.2
Fecal Coliform	20	430

The data provided includes monitoring data for discharges when no treated wastewater was being released into the I/P basins. These discharges consisted solely of groundwater being collected and released through the I/P basins underground drain system.

Based on information provided by the operator, the following is a typical wastewater loading of I/P basin procedure:

- Drawdown volume of Cell #3 into the I/P basins = 20-25 ac-ft
- Cell #3 valve open for approximately 48 hours then closed
- Takes about 7 days from initial I/P basin loading to complete discharge from I/P basins
- Approximately 28 gpm of groundwater continuously being collected and discharged from the I/P basin drain tile system.
- Typical frequency of discharge is once a month (average) except December through February when zero discharge occurs.

Inspections

An inspection was performed by personnel from the U.S. EPA, Indian Health Services and City of Wagner on October 30, 2008. The Inspection Report noted that a recent animal burrow and damage on the south side of Cell #2 should be repaired. Also discussed was an investigation of the local school's grease trap with respect to oil and grease release into the wastewater treatment facility. On December 29, 2008, the Inspection Report was sent to the permittee, outlining the inspection observations and corrective action findings. No written response from the City of Wagner to the EPA inspection findings to address the above issue has been received.

Water Quality Considerations

The Yankton Sioux Tribe does not have program authorization (treatment as state (TAS)) for water quality standards (WQS) that can be approved by the EPA. Furthermore, the Tribe has not developed WQS for the Yankton Sioux Indian Reservation. In the absence of water quality standards on the reservation, the EPA needs to consider protecting beneficial uses of the receiving waters. 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 be achieved by July 1, 1983”. The EPA regulations on water quality standards specify at 40 CFR Part 131.10(j) “A State must conduct a use attainability analysis as described in §131.3(g) whenever : (1) The State designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Act, or (2) The State wishes to remove a designated use that is specified in section 101(a)(2) of the Act or to adopt subcategories of uses specified in section 101(a)(2) of the Act which require less stringent criteria.” To this writer’s knowledge, a use attainability analysis has not been done on this Choteau Creek segment. Therefore, the beneficial uses of the receiving waters will be considered to include aquatic life and recreation.

Pollutants of concern from this wastewater discharge that may affect water quality include pH, ammonia-N, and bacteria including *Escherichia coli* (*E. coli*).

The previous permit required analysis for fecal coliform in the effluent. The EPA has recently established water quality criteria for *Escherichia coli* for protection of recreation uses that replace older recommendations for fecal coliform, therefore, for this renewal permit, limits and monitoring for *Escherichia coli* levels will be included.

Total ammonia is present in the aqueous environment in both ionized and un-ionized forms. It is the un-ionized form which is toxic. The proportion of total ammonia present in un-ionized form in the receiving stream is a function of the combined upstream and effluent ammonia concentrations, as well as pH and temperature characteristics in the receiving water. Ammonia is non-conservative (i.e., concentrations are affected by biological processes) and its toxicity is affected by environmental conditions (pH and temperature) in the receiving stream.

The limits for ammonia-N in the previous permit were based on SDSWQS ARSD 74:51:01 (South Dakota Department of Environment and Natural Resources Water Pollution Control Program, Total Ammonia Criteria) utilizing equations 2, 3 & 4 (Appendix A) and a mass balance equation. The limits were as follows:

Parameter	30-Day Average	7-Day Average	Daily Maximum
Ammonia, as N, mg/L			
March 1 - October 31	1.28	n/a	5.43
November 1 - February 29	6.06	n/a	10.38

In accordance with recommendations in the EPA’s implementation of the water quality criteria for ammonia-N, the determination of new effluent total ammonia limits for this renewal permit were derived using the Ammonia Toxicity Model (AMMTOX, version 2). This model incorporates ambient receiving water data (temperature, pH) in its calculations.

AMMTOX Model, version 2 was used to model the processes that define the controlling conditions for ammonia toxicity, predict the biological removal of ammonia, and project the downstream affects of ammonia present in the discharge of the wastewater treatment facility.

Both the previous permit's mass balanced equation method and the AMMTOX model utilize water quality data for the receiving waters, which for this permit none have been documented. Due to this lack of water quality data for Choteau Creek, pH and temperature information was taken from WQM 148, Turtle Creek, Storet # 460148, which is a similar creek. Table 1 below, lists stream pH and temperature data for station WQM 148 data on Turtle Creek for 2000 to 2005. This data, which is the most current data available, is the same data utilized in the previous permit ammonia calculations.

Table 1
WQM 148, Turtle Creek

Date	Temperature (Deg. C)	pH (SU)
4/18/00	7.2	8.47
7/17/00	23.9	9.07
4/12/01	7.2	8.18
7/16/01	25.5	6.96
1/9/02	2.8	8.21
4/15/02	18.3	8.61
4/10/03	12.2	9.38
4/22/04	11.1	9.64
1/20/05	0	9.41

Effluent Limitations

The following effluent limitations will be required for this facility at the Outfall 001 discharge:

Parameter	30-Day Average	7-Day Average	Daily Maximum	Basis for Limits
BOD ₅ , mg/L <u>b/</u>	30	45	n/a	Tech
Total Suspended Solids, mg/L <u>b/</u>	30	45	n/a	Tech
<i>Escherichia coli</i> , The 5-day geometric mean shall not exceed 630 colonies/100 mL. <u>a/</u>				
The pH of the effluent shall not be less than 6.5 nor greater than 9.0 in any single sample or analysis. The Basis for Limits is WQB for protecting warm water aquatic life.				
The concentration of oil and grease in any single sample shall not exceed 10 mg/l. <u>c/</u>				

- a/ The EPA does not have a 304(a) criteria recommendation for protection of secondary contact uses, but has historically approved numeric criteria that are 5 times the primary contact value of 126 colonies/100 mL (5 day geometric mean).

The limits for *Escherichia coli* apply between May 1 and September 30 only.

- b/ The limits for BOD₅ and total suspended solids are based on National Secondary treatment standards (40 CFR Part 133.102).
- c/ The limit for oil and grease is based on a combination of the EPA Region 8 BPJ and protecting the receiving waters from a visible sheen or floating oil.

Interim Effluent Ammonia Limits

Since the AMMTOX model results in slightly more stringent limits than the previous permit, the acquisition of creek data from the actual receiving stream rather than relying on data from a “similar” creek, will be beneficial. The permittee shall have the opportunity to request that the new limits outlined in this permit (Table 2) be re-evaluated based on current data prior to the new limits becoming effective. Therefore, as part of this permit, the permittee is requested to monitor the receiving stream (pH, temperature and flow characteristics) at the frequency listed below in the Self-Monitoring requirements. **During this monitoring period, the ammonia limits outlined in the previous permit shall be in effect until three (3) years after the effective date of this permit.**

Parameter	30-Day Average	7-Day Average	Daily Maximum
Ammonia, as N, mg/L			
March 1 - October 31	1.28	n/a	5.43
November 1 - February 29	6.06	n/a	10.38

Final Effluent Ammonia Limits

Table 2 presents the AMMTOX modeling software calculated effluent discharge limits by month of the allowable chronic (30 day average) and acute (daily maximum) ammonia levels expected within the receiving stream and downstream of the discharge point.

Table 2

Month	Chronic 30 Day Avg. (mg/L)	Acute Daily Max. (mg/L)
January	1.6	3.2
February	1.7	3.0
March	1.1	3.0
April	1.1	3.2
May	1.1	3.2
June	0.7	3.2
July	0.7	3.2
August	0.7	3.2
September	0.8	3.2
October	1.1	3.2
November	1.4	3.2
December	1.6	3.2

Stream background assumptions made in model:

- ammonia concentration = 0.01 mg/L
- flow = 0.1 cfs (low flow condition)

Assumed Effluent pH = 8.5 (Value used in model to closer match stream data due to mixing)

Upon written request by the permittee no later than 30 months after the effective date of this permit, the EPA can re-evaluate the ammonia limits in the AMMTOX model incorporating the monitored receiving stream data gathered in the first 2 years of the permit. The updated model’s results can then be compared to and replace the limits listed in Table 2 that become effective three (3) years after the effective date of

this permit. Should the permittee fail to provide the requested monitoring data, the final ammonia limits as outlined in Table 2 shall become effective three (3) years after the effective date of this permit.

Effluent Self-Monitoring Requirements

The following self-monitoring requirements are included in this permit:

Parameter	Frequency	Sample/Monitoring Type <u>a/</u>
Total Flow, MGD	<u>b/</u>	Instantaneous
BOD ₅ , mg/L	<u>b/</u>	Grab
Total Suspended Solids, mg/L	<u>b/</u>	Grab
<i>Escherichia coli</i> , no./100 mL <u>c/</u> , <u>d/</u>	<u>b/</u>	Grab
pH, standard units <u>e/</u>	<u>b/</u>	Grab
Oil and Grease, mg/L	<u>f/</u>	Grab
Oil and Grease Sheen	<u>f/</u>	Visual
Floating Solids and Foam	<u>g/</u>	Visual
Ammonia, as N, mg/L	<u>b/</u>	Grab
Temperature, °C	<u>b/</u>	Instantaneous

a/ See Permit Definitions, Part 1.1, for definition of terms.

b/ Effluent monitoring will be on a monthly basis with the following frequency:

During the month when no wastewater loading of the I/P basins: In addition to a flow measurement, one (1) sample shall be taken and analyzed for pH, temperature, ammonia and *Escherichia coli* only.

During the month when wastewater loading of the I/P basins: In addition to a flow measurement with each sample, a minimum of three (3) samples shall be taken for each loading. Monitoring shall include BOD₅, TSS, pH, temperature, ammonia and *Escherichia coli*. These samples to be taken shall be 1-2 days, 3-4 days and 4-5 days after the start of the I/P basins loading. If more than one loading of the I/P basins occurs in the same month, the average of all sample results shall determine the monthly average. All of the samples collected during the 7 day or 30 day period are to be used in determining the averages. The permittee always has the option of collecting additional samples if appropriate.

The start and termination dates, times and approximate volume of each wastewater loading of the I/P basins shall be reported in the comment section of the DMR forms.

The simultaneous, estimated flow condition of the receiving water for each loading shall also be reported (i.e., dry, low, high).

If, after two (2) years after the effective date of this permit, the monitored results are consistently within the prescribed effluent limits, the frequency of monitoring can be reduced to two (2) samples per loading. These samples to be taken shall be 1-2 days, and 4-5 days after the start of the I/P basins loading.

c/Monitoring for *Escherichia coli* is from May 1 and September 30 only.

d/ Acceptable analytical methods for *Escherichia coli* testing are referenced in 40 CFR Part 136.

- e/ Measurement must be taken within fifteen (15) minutes of sampling.
- f/ Visual observations for oil and grease shall be made on a weekly basis. In the event that an oil sheen or floating oil is observed in the discharge, a grab sample shall be immediately taken, analyzed and reported. The sample shall not exceed 10 mg/L.
- g/ A weekly visual observation for floating solids and foam is required, recorded in the daily log notebook and reported.

Receiving Stream Self-Monitoring Requirements

Monitored data (pH, temperature and flow characteristics) collection frequency for the receiving stream shall be monthly (minimum). The permittee can provide additional data if the opportunity arises. The monitoring location shall be identified and located far enough downstream of the discharge point to allow for complete stream mixing of the effluent and receiving stream waters. Stream monitoring shall be conducted when practical and accessible.

All receiving stream monthly monitoring data collected, including detailed location (latitude, longitude), dates and times of the sample collections, shall be tabulated in letter format and be submitted no later than 30 months after the effective date of this permit.

Sludge

Part 3.6, of the permit requires that the use and/or disposal of sludge be done in accordance under the authorization of an NPDES permit issued for the use and/or disposal of sewage sludge. Region 8 has issued a general permit for sewage sludge in Indian country in South Dakota.

If sludge is to be removed from the lagoon system, written permission must be obtained from the Environmental Protection Agency and a complete sampling and analysis for the metals listed in 40 CFR Part 503 must be performed. **Whether or not permission is granted will be based on the review of a one-time sludge disposal plan submitted by the permittee.** The permitted should contact the NPDES Permits Team, Water Program, Office of Partnerships and Regulatory Assistance of the EPA about what information would be required to be submitted in the plan.

Inspection Requirements

The permittee is required to inspect its wastewater treatment facility on at least a **weekly** basis. The inspection shall be conducted as outlined in Part 1.3.4. of this permit.

Reporting Requirements

This permit has changed the reporting period from six months to quarterly in order to better evaluate the monthly ammonia limits set forth in the permit. If no discharge occurred during that quarter, the report is to be marked "no discharge".

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. Federally listed threatened, endangered and candidate species found in Charles Mix County, South Dakota include:

<u>Species</u>	<u>Status</u>
Whooping crane (<i>Grus americana</i>)	E
Piping Plover (<i>Charadrius melodus</i>)	T
Least tern (<i>Sterna antillarum</i>)	E
Pallid sturgeon (<i>Scaphirhynchus albus</i>)	E

T Threatened
E Endangered

Due to the water quality of the discharge from the I/P basin outfall identified in this permit and the downstream mixing within the unnamed tributary and Choteau Creek, the EPA finds that this permit is Not Likely to Adversely Affect any of the species listed by the U. S. Fish and Wildlife Service under the Endangered 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 City of Wagner WWTP facility to assess this action's potential effects on any listed or eligible historic properties or cultural resources. 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 or point of discharge.

Miscellaneous

The effective date and the expiration date of the permit will be determined at the time of permit issuance. The intention is to renew the permit for a period of approximately five years, but not to exceed 5 years.

Permit drafted by Craig Jorgenson, SEE, 8P-W-WW. April 15, 2011.

Permit reviewed by Robert Shankland, SEE, 8P-W-WW, May 2, 2011

Permit reviewed by Bruce Kent, Senior Environmental Scientist, 8P-W-WW, May 11, 2011

Addendum

No comments were received during the 30-day public notice period which began August 24, 2011 and therefore, the permit is being issued as public noticed. The effective date will be October 1, 2011 and the expiration date will be September 30, 2016 for a five year permit.

Craig Jorgenson, SEE, 8P-W-WW, September 16, 2011.

**NPDES Permit SD-0020184, City of Wagner WWTP
DMR Data (2006 - 2010)
Attachment 1**

Monitoring Date	BOD5 (mg/L)		Total Suspended Solids (mg/L)		pH (s.u.)		Temp (°C)		Ammonia-N (mg/L)		Fecal Coliform (#/100 ml)		Flow (mgd)		Flow (gpm)
	30-day Avg.	7-day Avg.	30-day Avg.	7-day Avg.	Minimum	Maximum	Minimum	Maximum	30-day Avg.	Daily Max.	30-day Geo. Mean	Daily Max.	Avg.	Max.	Max
1/06-6/06	18	18	9	9	7.5	7.8		17.3	1.18	1.98	20	20		1.64	1139
6/06-6/06									0.10	0.10					
7/06-10/06									0.11	0.12					
7/06-12/06	3	3	7	7	7.4	8.2		20.6	-	0.32	430	430	0.347	1.64	1139
1/07-2/07									0.37	0.37					
1/07-6/07	7	7	8	8	7.1	7.7		18.1			30	30	0.569	1.641	1140
3/07-6/07									3.1*	3.1*					
7/07-10/07									0.33	0.33					
7/07-12/07	3	3	5	5	6.9	7.6		24.7			20	20	0.65	1.64	1139
11/07-12/07									0.22	0.22					
1/08-6/08	5.5	7	7	10	7.3	7.7		28.2					0.49	1.64	1139
1/08-2/08									-	0.27					
3/08-6/08									0.44	0.44					
5/08-6/08											-	80			
7/08-9/08											40	40			
7/08-10/08									0.19	0.19					
7/08-12/08	6	6	8	8	7.2	7.76		25					0.22	1.64	1139
11/08-12/08									0.77	0.77					
1/09-6/09	25	25	20	20	7.32	7.76		23.7	0.32	0.32	-	190	0.25	1.64	1139
7/09-9/09											110	110			
7/09-10/09									0.25	0.25					
7/09-12/09	5	5	9	9	7.4	7.63		24					0.262	1.64	1139
11/09-12/09									0.07	0.07					
1/10-2/10									-	0.28					
1/10-6/10	-	9	-	11	7.45	7.8		25					0.639	1.64	1139
3/10-6/10									-	6.88*					
5/10-6/10											80	130			
7/10-9/10											20	30			
7/10-10/10									0.18	0.30					
7/10-12/10	5	8	15.5	28	7.31	7.63		26	-	1.05			0.155	1.64	1139

*Report of hydraulic overloading, caused by rapid snow melt & heavy rains, the effluent received inadequate detention time.