

City of Estevan
Water and Wastewater Division

2015

Wastewater Treatment Plant
Annual Report on Operations



CITY OF ESTEVAN



MEMORANDUM

DATE: January 19, 2016
TO: Jeff Ward, City Manager
FROM: Kevin Sutter, AScT - WTP/WWTP Manager

RE: 2015 Annual Wastewater Report

The wastewater treatment plant (WWTP) was put on line January 1996. In short we take the entire wastewater collection flow and process it using a biological process called Biological Nutrient Removal / Activated Sludge Process. We then discharge the treated effluent to the holding cells and over the summer months SaskPower removes the effluent by pumping from holding cell "J". The waste sludge produced by these processes are dewatered and disposed of at the landfill. A provincial permit to operate that was put into place in November 25, 2015, requires us to maintain an effluent quality-leaving Cell "J".

Some highlights to the plant operation in 2014 are as follows:

- The new Bio-Solids processing building is complete but due to supplier issues the equipment to be placed inside have not been delivered as of December 31, 2015. We have been reassured that the equipment is coming, but it will not arrive until the spring of 2016. This is causing us to keep the equipment that was to be replaced by this facility up and running, which is getting exceedingly harder to do. The Bio-solids building is now slated to go on line by June 2016.
- We hired Stantec Consulting to do a detailed design of an efficiency upgrade to the WWTP facility that will see the outdated

Efficiency, Effectiveness, Excellence

equipment itemized in the study that was conducted replaced. This work was budgeted at \$1,000,000 and was supposed to be tendered in 2015. The design did not get completed and I have asked that this work be forwarded to be complete in 2016. These upgrades are required to keep the plant operational and to raise the efficiency so that the inevitable expansion of the whole facility can be delayed for a few more years to give the City the time required to develop a final plan to fund a system wide expansion. The efficiency upgrade is funded solely from the City Capital budget, but the plant expansion, when it happens, will be funded by partnerships, and we have also applied for a Canada Builds Grant.

Even though the WWTP effluent quality spiked from time to time, the holding ponds have been able to buffer these spikes, and as can be noted, the effluent-leaving Cell "J" meets the requirements set out in the new permit to operate total bacteria counts. We do not disinfect and the plant is being operated at maximum capacity, so this in mind the plant has operated relatively well. SPC uses the effluent as cooling water for SHAND and we do not discharge this effluent into the environment.

We inspect the lagoons once each week and the Water Security Agency completed an inspection as well, the inspection reports from WSA are attached.

The Wastewater treatment system was designed for a maximum daily flow of 6000m³ per day and in 2015 we surpassed that flow 3 of the 365 days. The volumes treated have dropped from 2014 mostly due to the down turn in the economy, so the plant operated relatively well, operating within its capacity for much of the year. The flow stabilization portion of the efficiency upgrade will extend the life of this facility, but we will need to continue to plan for an expansion once water use and disposal increase once again.

I have attached this report and tables for council's reference as well as to meet the requirements of the permit to operate, that say, that the annual report must be made available to the Water Security Agency.

Cell J - 2015

Test	25-May-15	16-Jun-15	7-Jul-15	4-Aug-15	16-Sep-15	13-Oct-15
Suspended Solids (mg/l)	3	7	14	9	17	25
pH	8.3	8.5	9.1	7.8	9.1	8.3
Chlorides (mg/l)	195	177	188	200	196	187
BOD (mg/l)	<2	3.4	2.7	2.2	5.2	3
Ammonia (mg/l as N)	1.16	0.26	0.16	0.34	0.23	2.75
Total Nitrogen (mg/l as N)	4	4.6	3.5	2.7	2.3	5.9
TKN (mg/l as N)	2.9	2.1	1.9	2.7	2.3	5.3
Total Phosphorus (mg/l)	1.86	2.7	1.85	1.53	2.49	3.98
E Coli (Orgs/100ml)	<10	<10	<10	10	<10	10
Total Coliform (Orgs/100ml)	63	1723	39300	5794	1785	19863

**City of Estevan
WWTP
Yearly Report
2015**

	Influent	
	Maximum	Minimum
Suspended Solids (mg/l)	1722	64
Biological Oxygen Demand (mg/l)	395	35.0
Temperature (C)	21.0	9.0
pH	8.8	6.9
TKN (mg/l as N)	264.0	12.5
Total Phosphorous (mg/l as P)	17.7	5.6
Ortho Phosphorous (mg/l as P)	9.4	1.0
Ammonia (mg/l as NH3)	50.0	2.9
Chemical Oxygen Demand (mg/l)	1312.0	138.0

Average
327.3
177.9
15.0
7.9
76.9
8.0
6.4
25.7
492.0

Effluent	
Maximum	Minimum
575.0	1.2
13.0	0.3
8.0	3.6
8.0	3.6
140.0	1.3
8.4	1.0
7.4	0.5
21.0	0.0
195.0	5.0

Average	% Removal
31.0	91%
4.7	97%
7.5	
7.5	
38.2	50%
3.8	53%
2.5	61%
6.2	76%
40.7	92%

Daily Flows (m3)	8241	3558
Peak Flow (l/s)	219	
Peak one hour flow (l/s)	207	
Peak four hour flow (l/s)	176	

4529

Totals	
Flow (m3)	1,652,887
Septage Received (m3)	18,793
Solids removed dry (Kg)	90,810
Effluent removed from Cell J (m3)	1,438,500

**City of Estevan
WWTP
Quarterly Report
1st Quarter 2015**

	Influent	
	Maximum	Minimum
Suspended Solids (mg/l)	1302	64
Biological Oxygen Demand (mg/l)	275	35
Temperature (C)	18.1	9
pH	8.7	7.6
TKN (mg/l as N)	264	42
Total Phosphorous (mg/l as P)	17.7	5.6
Ortho Phosphorous (mg/l as P)	8.4	1
Ammonia (mg/l as NH3)	41.3	2.9
Chemical Oxygen Demand (mg/l)	1120	138

Average
305
170
10.9
7.90
108.2
8.1
6.5
23.7
409

Effluent	
Maximum	Minimum
112	3.2
9	0
8.0	7.1
8.00	7.10
78.0	14.0
6.8	1.0
6.0	0.5
21.0	2.3
83	16

Average	% Removal
19	94%
4	98%
7.5	
7.49	62%
41.1	73%
2.2	76%
1.6	54%
10.9	93%
27	

Daily Flows (m3)	6230	4164
Peak Flow (l/s)	156	
Peak one hour flow (l/s)	139	
Peak four hour flow (l/s)	127	

4523

Totals	
Flow (m3)	407469
Septage Received (m3)	7122
Solids removed dry (Kg)	18519

City of Estevan
 WWTP
 Quarterly Report
 2nd Quarter 2015

	Influent	
	Maximum	Minimum
Suspended Solids (mg/l)	1722	126
Biological Oxygen Demand (mg/l)	250	85
Temperature (C)	17	10
pH	8.50	7.9
TKN (mg/l as N)	169	36
Total Phosphorous (mg/l as P)	10.4	5.9
Ortho Phosphorous (mg/l as P)	7.8	5.4
Ammonia (mg/l as NH3)	50	4.3
Chemical Oxygen Demand (mg/l)	1312	155

Average
299
185
13.9
8.09
74.2
7.9
6.5
27.2
567

Effluent	
Maximum	Minimum
575	4.4
9	3
7.9	7.4
7.90	7.40
140	14
7.4	2
6.1	0.8
18	2.9
179	17

Average	% Removal
84	72%
6	97%
7.7	
7.70	0%
74.1	28%
5.7	53%
3.1	58%
11.4	89%
65	

4647

Daily Flows (m3)	8241	4036
Peak Flow (l/s)	219	
Peak one hour flow (l/s)	207	
Peak four hour flow (l/s)	176	

Totals	
Flow (m3)	422782
Septage Received (m3)	5053
Solids removed dry (Kg)	19379

**City of Estevan
WWTP
Quarterly Report
3rd Quarter 2015**

	Influent	
	Maximum	Minimum
Suspended Solids (mg/l)	433	110
Biological Oxygen Demand (mg/l)	210	96
Temperature (C)	21	15.7
pH	8.20	6.9
TKN (mg/l as N)	106	21.2
Total Phosphorous (mg/l as P)	16	5.8
Ortho Phosphorous (mg/l as P)	9.2	2.4
Ammonia (mg/l as NH3)	39.2	5.1
Chemical Oxygen Demand (mg/l)	1189	334

Average
381
171
19.3
7.78
69.0
8.4
6.3
24.7
583

Effluent	
Maximum	Minimum
45.2	4
13	1
7.8	3.6
7.80	3.60
64	5.8
8.4	1.8
7.4	0.98
19.8	0.03
195	5

Average	% Removal
13	97%
4	97%
7.4	
7.36	67%
22.7	50%
4.2	51%
3.1	92%
2.1	92%
46	

4543

Daily Flows (m3)	5840	3835
Peak Flow (l/s)	195	
Peak one hour flow (l/s)	119	
Peak four hour flow (l/s)	109	

Totals	
Flow (m3)	417546
Septage Received (m3)	3848
Solids removed dry (Kg)	26605

**City of Estevan
WWTP
Quarterly Report
4th Quarter 2015**

	Influent	
	Maximum	Minimum
Suspended Solids (mg/l)	1672	84
Biological Oxygen Demand (mg/l)	395	75
Temperature (C)	19	12
pH	8.80	7.1
TKN (mg/l as N)	78.8	12.5
Total Phosphorous (mg/l as P)	10.6	6.2
Ortho Phosphorous (mg/l as P)	9.4	2.4
Ammonia (mg/l as NH3)	42.5	14.1
Chemical Oxygen Demand (mg/l)	599	165

Average
325
185
15.9
7.87
56.1
7.7
6.2
27.3
409

Effluent	
Maximum	Minimum
20.8	1.2
12	2
7.8	7.1
7.80	7.10
35	1.25
4.1	1.8
3.5	1.3
1.1	0.05
58	7

Average
9
4
7.6
7.56
15.1
3.1
2.2
0.3
25

% Removal
97%
98%
73%
60%
65%
99%
94%

4404

Daily Flows (m3)	5215	3558
Peak Flow (l/s)	219	
Peak one hour flow (l/s)	104	
Peak four hour flow (l/s)	78	

Totals	
Flow (m3)	405091
Septage Received (m3)	2770
Solids removed dry (Kg)	26307



Government of
Saskatchewan

Lagoon Compliance Inspection

System Name:	<u>ESTEVAN WASTEWATER WORKS</u>	Remote Inspection ID: 242022
Approval No:	<u>00003168-02-00</u>	
Date:	<u>28-APR-2015 09:00</u>	
Announced:	<u>No</u>	

Pumping Stations			Total Pumping Stations:		6						
Pumping Station #	Number of			Permanent Ventilation	Type of Exhaust	By-Pass Works	By-passes		Potable water outlet		
	Pumps	Wet Wells	Dry Wells				Date	Reported	Present	Backflow Protection	
<u>Lagoons</u>			Total Storage Cells: <u>7</u>		Total Treatment Cells: <u>1</u>						
Cell Number	Cell Type	Freeboard Estimate (m)	Odour	Liquid Color	Dyke Condition	Seepage					
C	STORAGE	.90	NONE	LIGHT GREEN	GOOD	NONE EVIDENT					
E	STORAGE	.90	NONE	LIGHT GREEN	GOOD	NONE EVIDENT					
F	STORAGE	.90	NONE	LIGHT GREEN	GOOD	NONE EVIDENT					
G	STORAGE	.90	NONE	LIGHT GREEN	GOOD	NONE EVIDENT					
H	STORAGE	.90	NONE	LIGHT GREEN	GOOD	NONE EVIDENT					
I	STORAGE	.90	NONE	LIGHT GREEN	GOOD	NONE EVIDENT					
J	STORAGE	.90	NONE	LIGHT GREEN	GOOD	NONE EVIDENT					
Cell Number	Date Started	Date Finished	Starting Freeboard (m)	Ending Freeboard (m)							

Regulatory Section

C=Compliant NC=Non-Compliant N/A=Not Applicable

C	NC	NA	General	Comments
			Approved system EMPA 21(1)	
			Certified operator 63	

		No interconnection between sanitary sewer and storm sewer 14	
		Pumping stations must have mechanically forced air ventilation 15(1)	
		All water outlets that may come into contact with a waste must be equipped with a backflow device 15(2)	
Facultative Lagoon			
		Two basins in series 16(4)a	
Reporting			
		Immediate reporting of upset/bypass condition 17(2)	
		Immediate reporting of failure of disinfection equipment 18(2)a	
		Immediate reporting of low chlorine levels 18(2)b	
		Reporting of exceedance see permit	
Disinfection			
		Disinfection performed as per permit 18(1)	
Records			
		Maintenance work of treatment components 19(b)i	
		Types, dosages and total amounts of chemicals or other substances added 19(b)ii	
		Dates of discharge of sewage and volumes of discharge 19(b)iii	
		Locations from which samples are taken 19(b)iv	
		Results of any tests 19(b)v	
		Maintained in appropriate manner see permit	
Testing			
		On-site testing completed as required see permit	
		Sampling done as required see permit	

Comments

Bill Baker

(Operator/Supervisor Signature)

BS

Agree with statements

Ries Man...

(EPO Signature)



Government of
Saskatchewan

Mechanical Plant Compliance Inspection

System Name:	<u>ESTEVAN WASTEWATER WORKS</u>	Remote Inspection ID: 242020
Approval No:	<u>00003168-02-00</u>	
Date:	<u>28-APR-2015 09:00</u>	
Announced:	<u>No</u>	

<u>Pumping Stations</u>			Total Pumping Stations:		<u>6</u>					
Pumping Station #	Number of			Permanent Ventilation	Type of Exhaust	By-Pass Works	By-passes		Potable water outlet	
	Pumps	Wet Wells	Dry Wells				Date	Reported	Present	Backflow Protection
1	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y	Y
2	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y	Y
7	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y	Y
8	2	2	0	Y	FORCED DRAFT	N	N/A	N	Y	Y
6	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y	Y
4	2	1	0	Y	FORCED DRAFT	N	N/A	N	Y	Y

Treatment Processes

Primary Treatment

Process	Comments	Date of last by-pass
MECHANICAL BAR SCREEN		16-JUN-2011 09:07
GRIT CLASSIFICATION		16-JUN-2011 09:08

Secondary Treatment

Process	Comments	Date of last by-pass
ACTIVATED SLUDGE PROCESS (SEQUENCING BATCH REACTOR)		16-JUN-2011 09:09

Tertiary Treatment

Process	Comments	Date of last by-

		pass
DIGESTER		16-JUN-2011 09:09
BIOLOGICAL NUTRIENT REMOVAL (BNR) - BIOLOGICAL PHOSPHOROUS REMOVAL		16-JUN-2011 09:09

Regulatory Section

C=Compliant NC=Non-Compliant N/A=Not Applicable

C	NC	NA	General	Comments
X			Approved system EMPA 21(1)	
X			Certified operator 63	
	X		No interconnection between sanitary sewer and storm sewer 14	THE CITY HAS BEEN WORKING ON REMOVING STORM WATER FROM THE SANITARY SYSTEM BUT A FEW CONNECTIONS STILL EXIST. THIS IS ONGOING, NONE REMOVED THIS YEAR. THE CITY MUST DEVELOP A PLAN FOR REMOVAL.
X			Pumping stations must have mechanically forced air ventilation 15(1)	
X			All water outlets that may come into contact with a waste must be equipped with a backflow device 15(2)	
			Secondary Treatment Process	
X			Effluent quality demonstrated to meet permit requirements for BOD5 16(3)a(i)	
	X		Effluent quality demonstrated to meet permit requirements for TSS 16(3)a(ii)	TSS OVER OVER 20MG/L MORE AND MORE FREQUENTLY. THE PLANT DEMONSTRATES THAT IT IS CAPABLE OF VERY GOOD TSS. HOWEVER IT SEEMS TO HAVE FREQUENT UPSETS THAT HOPEFULLY ARE RECTIFIED WITH THE UPGRADES. THE HOODS ARE THE ISSUE. THE CITY MUST DEVELOP A PLAN TO FIX THIS ISSUE.
			Reporting	
X			Immediate reporting of upset/bypass condition 17(2)	
	X		Reporting of exceedance see permit	THE PERMIT EXCEEDANCES MUST BE REPORTED
			Disinfection	
			Records	
X			Maintenance work of treatment components 19(b)i	
X			Types, dosages and total amounts of chemicals or other substances added 19(b)ii	
X			Dates of discharge of sewage and volumes of discharge 19(b)iii	
X			Locations from which samples are taken 19(b)iv	
X			Results of any tests 19(b)v	

X		Maintained in appropriate manner see permit	
		Testing	
X		On-site testing completed as required see permit	THE IN HOUSE TESTING PARAMETERS NEED TO BE AMENDED WITH THE NEW PERMIT
X		Sampling done as required see permit	

Comments

THE AMMONIA LEVELS ARE FREQUENTLY OVER THE PERMIT REQUIREMENTS

Bill Baker

(Operator/Supervisor Signature)

BB

Agree with statements

Kyle Wong

(EPO Signature)



Wastewater Works Compliance Inspection

System Name:	<u>ESTEVAN WASTEWATER WORKS</u>	Remote Inspection ID: 242018	
Approval No:	<u>00003168-02-00</u>		
Population:	<u>11200</u>	Announced:	<u>No</u>
Date:	<u>28-APR-2015 09:00</u>	Person Interviewed:	<u>BAKER, BILL</u>

General Section

Wastewater Treatment Type:	<u>MECHANICAL</u>	System Classification:	<u>THREE</u> WWT <u>TWO</u> WWC
Sewage Categorization:	<u>MUNICIPAL</u>	Discharge Easement:	<u>Yes</u>
Collection Type:	<u>GRAVITY</u>		
Comments:	N/A		

Contacts

Name	Position	Phone / Fax	Email
SUTTER, KEVIN	MANAGER	Phone: (306) 388-2545 Business: (306) 634-1822 Cell: (306) 421-0114	N/A
BAKER, BILL	CERTIFIED OPERATOR	Phone: (306) 634-6219 Business: (634) 634-8662	N/A
KING, DANIEL	CERTIFIED OPERATOR	Business: (306) 634-1829	N/A
Complaints:			
NONE			
Information Delivered to Operator:			
NONE			

Operator Certification Section

Operator Name	Certification Levels		Expiry Date	Operator is a Supervisor	Certification Exam Written	Taken Training	Plans to Test or Take Training
	Wastewater Collection	Wastewater Treatment				# of CEUs	

BAKER, BILL	NONE	THREE	01-SEP-2015	No	Yes	.6	Yes
SUTTER, KEVIN	NONE	THREE	01-SEP-2015	Yes	Yes	.0	Yes
KING, DANIEL	TWO	NONE	15-MAR-2016	No	Yes	.0	Yes

Discharge Area

Discharge Type: INTERMITTENT

Disinfection: No

Effluent Treatment: AQUATIC VEGETATION

Discharge Area: MARSH

Land Use in Receiving Area:
INDUSTRIAL

Nearest Residence:
300M

Latitude: N/A Longitude: N/A


Discharge Area Comments:
SASK POWER TAKES 100% OF THE DISCHARGE

Sludge Handling

Final Sludge Disposal: N/A

Final Sludge Handling: N/A

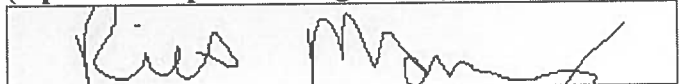
Comments:



BB

Agree with statements

(Operator/Supervisor Signature)



(EPO Signature)

Estevan WWTP Summary

Month of Jan-15

Date	Flow Est. M3	Influent				Mixed Liquor										Effluent									
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell4 30 min	Set.Solids Cell5 60 min	R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D.O. mg/l	pH	S.S. Composite	BOD Composite				
1	4371							3.6	3000	3300	3700	300	200	450	400	550	500	25	6	10.0	3.4	7.3	12.4	5.0	
2	4738	11	7.7	205		346													4						
3	4396																								
4	4429							4	3300	3800	3700	400	330	800	680	800	680	25	4	11.0	4.5	7.2	6.0		
5	4626	12	8			214		4.1	3300	4000	3800	500	400	700	600	600	500		9.9	10.0	3.7	7.2	9.6		
6	4481	9.6	7.7	268		314	9.7	3.1	3300	4100	4000	500	350	650	500	700	600		10.0	10.0	3.3	7.3	2.0		
7	4452	10	7.8	282		282		3.4	3400	4100	3900	550	400	800	700	850	750		10.0	10.0	3.9	7.3	1.6		
8	4435	11	8	290		290	9.2	3.4	3400	4100	3900	500	400	800	700	750	650		5	10.0	3.5	7.2	12.8	5.5	
9	4433	10	7.7	275		398		3.4	3400	4100	3800	500	400	800	700	750	650								
10	4404																								
11	4477					444		3.6	3300	4400	4100	550	450	900	800	800	700		6	10.0	4.0	7.3	11.6		
12	4647	10	8	320		226		3.8	3600	4300	4400	600	550	950	900	850	750		10.0	10.0	4.1	7.4	23.6		
13	4439	10	7.7	276		276	11.3	3.5	3600	4500	4500	750	650	950	900	900	800		11.0	11.0	4.0	7.4	4.0		
14	4586	11	7.7	166		166		3.2	3600	4500	4800	700	550	900	700	900	850		12.0	12.0	4.8	7.2	18.0		
15	4381	11	7.7	200		198		3.5	3700	4500	4800	700	500	900	700	900	800		11.0	11.0	3.6	7.1	7.6	4.2	
16	4398	11	7.6	200																					
17	4266																								
18	4406					212		3	4000	4300	4700	800	700	800	700	980	950		7	11.0	4.1	7.3	5.2		
19	4656	11	7.7	204		216		3.7	4000	5000	4800	800	750	750	700	900	900		8	11.0	4.0	7.1	9.2		
20	4497	11	7.6	204		150		4	4100	4800	5800	900	800	950	850	980	950		11	11.0	4.0	7.2	7.6		
21	4261	11	7.7	512		512		3.6	3900	4100	4400	800	700	800	750	850	700		11	12.0	4.5	7.1	14.0		
22	4334	11	7.6	255		204		6.4	3800	3900	4100	850	700	900	700	900	800		8	13.0	4.0	7.2	40.0	9.2	
23	4406	12	7.6	255																					
24	4908																								
25	4659					308		4.6	3600	3900	4300	650	550	800	550	900	800		8	13.0	4.7	7.2	7.2		
26	5022	12	7.7	272		188		3.2	3400	4100	4200	400	300	750	600	850	750		12.0	12.0	3.3	7.3	6.4		
27	4767	13	7.8	346		346	9.6	4.2	3500	4200	4100	400	300	950	550	950	800		11.0	11.0	3.7	7.2	3.2		
28	4422	11	7.7	366		366		4.2	3700	4000	4200	450	300	550	400	800	550		11.0	11.0	3.8	7.2	13.6		
29	4497	12	7.8	268		268	11	4	3600	4400	4000	500	450	950	850	750	750		11.0	11.0	3.7	7.2	13.2	4.8	
30	4553	11	7.8	170																					
31	4416																								
TOTAL	139763					150			3000		3700	300	200	450	400	550	500		4			7.1	1.6	4.2	
MIN	4261	9.6	7.60	170		512			4100		5800	900	800	950	900	980	950		11			7.4	40.0	9.2	
MAX	5022	13.0	8.00	275		282			3576		4290	600	492	810	678	836	740		25			7.2	10.9	5.7	
AVE	4508	11.0	7.74	221															25						
Peak Flow	100.4 l/s	Peak One Hour	125 l/s	Peak Four Hour	82 l/s																				
BOD Removed (kg)	30085	Sludge removed	97,070 Kg Hauled																						
OTHER NUTRIENTS (mg/l)																									
TKN																									
PHOSPHORUS																									
AMMONIA as NH3																									
COD																									
RAW SEWAGE																									
TREATED EFFLUENT																									

Estevan WWTP Summary

Month of Feb-15

Date	Flow Est. M3	Influent				Mixed Liquor										R.A.S.		W.A.S.		Effluent				
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 60 min	Time/Cycle min	Time/Cycle min	Temp C	D.O mg/l	pH	SS Composte	BOD Composte	
1	4468																							
2	4485	11	8.7		478	1302		2.3	3700	4600	4200	700	650	900	900	850	25	8	11.0	5.0	7.6	10.0		
3	4357	10	7.8			278	9.1	5.2	3500	4300	4100	650	500	950	850	850			11.0	4.6	7.7	11.6		
4	4418	10	8.2			186		4.4	3800	4600	3800	650	500	950	900	750			11.0	3.6	7.6	2.0		
5	4415	12	8			252		4	3500	3500	4100	600	450	700	600	800	25		10.0	3.0	7.4	4.8	2.8	
6	4317	11	7.8	185		560		2.8	3400	3900	3700	500	300	800	700	550								
7	4275																							
8	4164																							
9	4437	9	7.8			290	10.1	4.3	3400	4200	4400	400	300	850	700	800	25	8	10.0	5.0	7.6	9.6		
10	4268	10	7.9			390		4	3600	3400	3700	500	400	400	350	500	400		11.0	3.5	7.4	10.4		
11	4316	11	7.9		36		10	6.8	3400	3200	4100	400	300	350	300	900			9.0	4.2	7.5	4.8		
12	4295	11	7.8	35		538		6.6	3400	4000	3300	400	350	900	700	400	350		11.0	3.6	7.6	10.0	0.3	
13	4449	18.1	8.2			138		6.4	3500	3700	3600	550	420	800	630	530	400		14.2	5.2	7.8	48.0		
14	4225																							
15	4173																							
16	4411																							
17	4410	11	7.8			166	9.5	5.9	3800	4500	4000	600	400	700	600	600	500	8	10.0	3.9	7.6	13.2		
18	4532	10	7.9		366	498		6.1	3500	4600	4100	400	300	800	700	700	600		9.0	3.5	7.3	19.2		
19	4384	10	7.8			612		6.5	3500	4100	3800	400	350	850	750	850	750		10.0	4.9	7.7	4.4		
20	4311	10	7.9	150		304		3	3600	4000	4100	500	400	850	700	750	600		10.0	3.4	7.7	9.6	3.8	
21	4297																							
22	4409																							
23	4558	11	7.8			162	16.6	2.6	3500	4500	4000	600	500	950	800	800	700	25	11.0	4.0	7.4	20.4		
24	4552	10	8		340	406		2.9	3600	4100	4200	450	300	850	750	950	800		10.0	4.3	7.7	8.0		
25	4556	10	7.8			324		4	3800	4200	4200	550	500	900	800	900	900		9.0	3.4	7.6	12.4		
26	4529	9	8	110		228		5.7	3500	4600	3900	450	350	950	950	900	800		8.0	4.5	7.6	20.0	2.5	
27	4418	10	8			114		2.9	3500		3600	420	340			510	400		9.0	5.7	7.4	62.0		
28	4236																							
TOTAL	122665																							
MIN	4164	9.0	7.80	35		70			3400		3300	400	300	350	300	400	350	25	8		7.3	1.6	0.3	
MAX	4558	18.1	8.70	185		1302			3800		4400	700	650	950	950	950	900	25	8		7.8	62.0	3.8	
AVE	4381	10.7	7.95	120		359			3553		3942	512	401	803	704	752	650	25	8		7.6	14.8	2.4	
Peak Flow	156 l/s	Peak One Hour	102 l/s	Peak Four Hour	69 l/s																			
BOD Removed (kg)	14432	Sludge removed	46,350 Kg Hauled																					
OTHER NUTRIENTS (mg/l)																								
TKN																								
PHOSPHORUS																								
AMMONIA as NHS																								
COD																								
RAW SEWAGE																								
TREATED EFFLUENT																								

Estevan WWTP Summary

Month of Mar-15

Date	Flow Est. M3	Influent			Mixed Liquor										Effluent										
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	30 min	60 min	30 min	60 min	30 min	60 min	R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D.O mg/l	pH	S S Composite	BOD Composite	
1	4360																								
2	4407	12.6	7.9			174		3.9	3900	4200	4100	800	700	950	850	940	890	25	8	14.3	4.8	7.8	46.4		
3	4332	14	8.1			310		5.7	3800	4600	4600	660	450	840	700	940	690			14.2	5.5	8.0	75.2	2.2	
4	4346	14.2	8.1	205		120		6.9	3700	4500	4900	710	390	810	680	950	720			13.0	6.3	7.9	61.2		
5	4304	15	8.4			140		6.4	3800	4400	4700	700	420	845	730	920	810			14.5	5.2	7.6	112.0		
6	4470	9.9	8.4			354		4.2	3600	4300	4100	450	340	940	740	930	750			10.8	3.5	7.5	41.0		
7	4802																								
8	5164					616		4	3800	4400	5000	450	350	850	700	950	850	25	8	11.0	3.8	7.6	30.0		
9	6230	10	8.4			256		3.9	3700	5300	4400	450	300	950	850	950	550			11.0	3.7	7.6	18.4		
10	5731	9	8.1			282		5.3	3800	5400	4200	500	400	950	850	900	600			10.0	5.0	7.8	33.2		
11	5100	10	7.9			240		3.8	3700	5400	4400	350	250	900	550	500	300			11.0	5.0	7.7	23.2	5.0	
12	5211	10	8	250		240		4.2	3990	5420	4020	360	290	970	920	430	330			10.5	4.0	7.4	81.0		
13	4764	9.5	8.1			246																			
14	4595																								
15	4581					328		3.7	4000	5600	4600	400	300	970	900	900	500	25	10	11.0	3.5	7.4	8.0		
16	4620	11	7.7			294		5.2	4500	5100	4500	650	500	900	800	800	600			11.0	4.0	7.5	8.4		
17	4703	11	7.8			306		4.6	3900	5600	4500	400	300	950	950	900	500			10.0	3.1	7.6	14.4		
18	4677	10	7.8			274		5.1	4000	5500	4500	400	300	900	850	850	550			11.0	3.7	7.7	22.0		
19	4574	11	8.1			64		4	4400	5300	4400	450	350	900	500	500	400			10.0	3.0	7.7	3.6	1.5	
20	4710	10	7.9	70																					
21	4325																								
22	4498					294		3.8	4300	5100	5000	500	400	850	700	950	900	25	10	11.0	2.9	7.6	19.2		
23	4497	10	8			184		4	3800	4800	4100	450	350	950	700	550	400			10.0	3.4	7.8	16.8		
24	4435	10	7.9			248		4.2	3600	4900	4300	500	400	950	900	800	600			10.0	3.0	7.8	3.2		
25	4613	10	8			388		3.9	3600	5000	4400	500	450	950	900	950	850			10.0	3.2	7.7	25.6		
26	4495	10	8			252		3	3800	5000	4300	600	400	950	950	900	900			10.0	2.6	7.5	3.6	4.2	
27	4542	10	7.8	150																					
28	4376																								
29	4528					382		3.6	3800	5000	4400	850	500	980	950	900	900	25	10	12.0	3.0	7.8	16.0		
30	4610	12	8			252		2.8	4000	4700	4000	700	400	950	600	600	400			13.0	3.7	7.8	11.6		
31	4442	12	7.9			190																			
TOTAL	145041																								
MIN	4304	9.0	7.70	70		64			3600		4000	350	250	810	500	430	300	25	8				7.4	3.2	1.5
MAX	6230	15.0	8.40	250		616			4500		5000	850	700	980	950	950	900	25	10				8.0	112.0	5.0
AVE	4679	11.0	8.01	169		273			3886		4428	538	388	918	785	830	645	25	9				7.7	30.6	3.2
Peak Flow	142 I/s	Peak One Hour	139 I/s	Peak Four Hour	127 I/s																				
BOD Removed (kg)	24008	Sludge removed	41,770 Kg Hauled																						
		OTHER NUTRIENTS (mg/l)										RAW SEWAGE		TREATED EFFLUENT											
		TKN										138.5		50.3											
		PHOSPHORUS										Ortho Total		6.8		1.0									
												7.5		1.4											
		AMMONIA as NH3										14.8		10.1											
		COD										350		39.7											

Estevan WWTP Summary

Month of Apr-15

Date	Flow Est. M3	Influent			Mixed Liquor										R.A.S.		Effluent				
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Sat Solids Cell3 30 min	Sat Solids Cell4 30 min	Sat Solids Cell5 60 min	Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D O mg/l	pH	S.S Composite	BOD Composite
1	4355	12	8	115		194		3.1	3600	5100	4100	500	400	700	600	500	10	3.0	7.8	21.2	8.5
2	4369	11	8	115		66		3	4100	4700	4300	600	450	850	800	600		12.0	7.4	8.0	
3	4198																				
4	4086																				
5	4112																				
6	4359	10	7.9			356		1.6	3600	5100	4400	450	350	980	950	920	10	10.0	4.0	7.5	2.4
7	4415	10	7.9			730		2.4	3800	4700	4200	550	400	950	900	900		10.0	3.6	7.5	6.4
8	4326	11	8			252		3.1	3600	4800	4500	450	400	950	900	900		11.0	3.6	7.8	18.0
9	4463	11	8	205		694	14.8	3.4	3500	5000	4400	400	300	980	950	800		17.0	4.2	7.8	28.8
10	4486																				
11	4401																				
12	4487																				
13	4565	12	8.1			274		2.4	3600	5200	4500	440	350	980	950	800	10	12.0	3.6	7.6	116.0
14	4442	12	8			4.8		6.8	4300	5200	4300	600	550	980	950	500		12.0	3.3	7.7	4.8
15	4379	13	7.9			21.2		2.9	4500	5200	5000	600	450	980	950	650		13.0	4.0	7.7	21.2
16	4373	12	7.9			15.2	18.4	5.1	4100	5400	4800	450	400	950	900	600		12.0	3.4	7.7	15.2
17	4353	12	8	200		1180		5.4	4200	5200	4400	550	400	980	950	450	14	13.0	3.9	7.7	18.8
18	4338																				
19	4419																				
20	4528	13	8.2			248		2.6	3500	4900	4000	450	350	980	950	700	14	12.0	3.8	7.6	5.6
21	4439	13	8.1			158	7.6	3.2	3500	4700	3800	500	350	980	950	500		13.0	4.0	7.7	7.6
22	4499	13	8.1			284		3.4	3400	4700	3900	500	300	950	900	650		13.0	4.6	7.7	20.0
23	4533	13	8			107.6		3.1	3600	4800	3800	500	300	950	900	700		12.0	5.0	7.7	20.0
24	4366	13	8	245		308		4.9	3300	4800	3500	450	300	980	950	400	10	12.0	5.0	7.7	23.2
25	4380																				
26	4339																				
27	4542	12	8.2			232		6.8	3200	4400	3500	400	300	950	900	400	10	13.0	4.7	7.6	41.2
28	4373	13	8.3			266	10.2	5.7	3400	5000	3500	400	300	980	950	400		14.0	4.2	7.7	3.2
29	4488	13	8.3			362		6	3400	4800	3500	400	300	950	900	400		13.0	5.0	7.8	13.6
30	4499	14	8.2			458		6.2	3500	4700	3700	400	300	950	850	400		14.0	5.8	7.8	27.6
31																					
TOTAL	131911																				
MIN	4086	10.0	7.90	115		5			3200		3500	400	300	850	600	400	10		7.4	2.4	6.5
MAX	4565	14.0	8.30	245		1180			4500		5000	950	550	980	950	980	25		7.8	116.0	9.0
AVE	4397	12.2	8.06	191		310			3685		4105	497	363	958	892	761	25		7.7	21.1	8.0

Peak Flow	141 l/s	Peak One Hour	85 l/s	Peak Four Hour	68 l/s
BOD Removed (kg)	24173	Sludge removed	66,190 Kg Hauled		
TKN	84.5				
PHOSPHORUS	6.4				
Ortho Total	8.3				
AMMONIA as NH3	24.3				
COD	741				
OTHER NUTRIENTS (mg/l)					
RAW SEWAGE					
TREATED EFFLUENT					

Estevan WWTP Summary

Month of May-15

Date	Flow Est. M3	Influent				Mixed Liquor										R.A.S.		Effluent						
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Sat.Solids Cell3 30 min	Sat.Solids Cell3 60 min	Sat.Solids Cell4 30 min	Sat.Solids Cell4 60 min	Sat.Solids Cells 30 min	Sat.Solids Cells 60 min	Temp C	D.O. mg/l	pH	SS Compose	BOD Compose		
1	4365	13	8.1	232		250	11.2	6.1	3100	4500	4200	400	300	950	900	700	25	10	14.0	6.1	7.8	10.8	4.8	
2	4447																							
3	4407					274		7.3	3200	4300	3200	490	370	980	930	340			12.9	5.1	7.6	92.0		
4	4422	12.8	8.2			174		6.3	3180		3330	420	330			490			13.2	5.3	7.5	294.0		
5	4424	13	8.1			150	12.4	6.2	3120		410					450			13.9	4.4	7.5	160.0		
6	4348	13	7.9			212		6	3100	4400	3400	400	300	950	850	600	25	15	15.0	4.2	7.6	24.4		
7	4461	14	8			302		5.6	3300	4000	3100	400	350	900	850	400			15.0	5.1	7.7	188.0	4.8	
8	4331	14	8.1	150																				
9	4208																							
10	4272					290	11.4	4.1	2900	4000	3100	400	300	900	850	400	25	15	15.0	5.0	7.7	44.4		
11	4449	14	7.9			256		6.7	2800	3600	3000	400	300	800	700	550			13.0	7.0	7.7	141.0		
12	4411	12	7.9			198	11	7	2600	3300	2700	300	200	700	600	300	5		13.0	7.7	7.7	228.0		
13	4427	13	7.9			332		7.2	2900	3400	2700	300	200	600	550	300			13.0	8.0	7.7	144.0		
14	4260	12	8.1			110		7.1	3000	3700	2500	500	350	900	800	200	25	10	13.0	4.8	7.8	45.2	2.8	
15	4278	12	8.1	85																				
16	4951																							
17	5501					130		8.8	2600	3200		390	300	650	410				11.8	7.0	7.6	140.0		
18	4624	12	8.1			178		7.2	2600	3330		310	250	920	820				13.4	6.8	7.6	170.0		
19	4664	12	8.06			286		8	2760		2510	340	270			310			13.2	6.2	7.6	86.0		
20	4648	13.4	8.14			188		7.4	2790	3080		360	280	530	370				13.7	7.9	7.6	82.0		
21	4564	12.9	8.19					7.5	2900	3200	2700	450	300	600	500	300	25	10	15.0	4.7	7.7	20.0	5.5	
22	4505	13	7.9	175		250																		
23	5653																							
24	4411					412	12.2	6.4	2900	2900		300	250	300	250	300	25	10	15.0	4.4	7.7	4.4		
25	4643	14	7.9			334		5.6	2800	3200	2900	300	250	600	550	300	25		18.0	4.9	7.7	344.0		
26	4714	17	7.9			166		3.3	3100	4400	3000	400	300	900	400	300			16.0	6.0	7.8	530.0		
27	4529	16	8.1			336	11.5	3.5	3200	4300	4100	400	350	950	900	800			16.0	4.0	7.8	20.4		
28	4523	17	8			98		6	3600	4800	3500	650	500	950	900	500			14.0	4.2	7.8	400.0	5.8	
29	4478	15	8.3	185																				
30	4422																							
31	4630																							
TOTAL	140970					98			2600		2500	300	200	300	250	300	25	5			7.5	4.4	2.8	
MIN	4208	12.0	7.90	85		412			3600		4200	650	500	980	930	900	25	15			7.8	530.0	5.8	
MAX	5653	17.0	8.30	232		235			2979		3108	396	303	785	702	451	25	11			7.7	150.9	4.7	
AVE	4547	13.6	8.04	165							88													

Peak Flow	210 l/s	Peak One Hour	125 l/s	Peak Four Hour	88 l/s	OTHER NUTRIENTS (mg/l)	RAW SEWAGE	TREATED EFFLUENT
BOD Removed (kg)	22648	Sludge removed	102,970 Kg Hauled			TKN	70.4	63.6
						PHOSPHORUS	6.7	3.0
						Ortho Total	8.0	5.5
						AMMONIA as NH3	31.8	12.4
						COD	513	76.0

Estevan WWTP Summary

Month of Jun-15

Date	Flow Est. M3	Influent			Mixed Liquor										Effluent								
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell4 30 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D.O mg/l	pH	S.S Composite	BOD Composite	
1	4703	16	8.2	224	260	10.6	5.4	3200	5300	4200	450	400	980	950	900	25	20	17.0	5.7	7.9	575.0		
2	5714	15	8.2		274		4.8	3200	4600	4300	600	980	950	900			16.0	5.2	7.8	290.0			
3	4835	16	8.2		244		6.9	3700	4400	3600	850	900	900	850			12	16.0	5.2	7.8	15.6		
4	4852	16	8.3		250		6.4	3200	4600	3600	600	980	950	900			16.0	7.0	7.8	148.0			
5	5253	15	8.5	250	392	10.1	5.7	3200	4800	4000	450	400	950	850	750			16.0	3.8	7.8	4.8	5.0	
6	8241																						
7	5294																						
8	5351	16	8.3	28	440		6.4	2800	3800	3000	350	850	750	350	250	25	12	17.0	6.7	7.8	31.2		
9	5341	15	8.2		454		6.1	2700	3800	2900	300	200	800	750	300	250		17.0	4.4	7.8	15.6		
10	7934																						
11	4271																						
12	4036	17	8.1		342		2.4	4300	5200		400	350	600	500			0	17.0	4.6	7.9	32.6		
13	4706																						
14	4747																						
15	4869	15.4	8.3		140		1.1	4000	5860	4320	950	880	990	960	920	25	0	15.5	5.9	7.4	71.0		
16	4864	16	8.4	228	296		1.7										15	16.0	5.3	7.6	6.0		
17	4848																						
18	4776	17	8.1		174		3.9	4100	5500	4700	950	900	970	950	920			16.0	2.7	7.7	28.0		
19	4296	17	8	130	126		2.6	4100			900	850						17.0	7.0	7.8	29.6	3.8	
20	4256																						
21	4297																						
22	4562	16	8		1722		3	2800	3200	2700	400	300	800	700	450	25	15	16.0	3.8	7.7	4.8		
23	4735	16	8.1	158	218		4.8	2600	3300	2700	400	300	950	900	400			16.0	4.4	7.8	19.2		
24	4882	16	8		164		4.2	2600	3200	2800	300	250	900	850	400			17.0	3.8	7.8	2.8		
25	4766	16	7.9		284		2.7	2600	3500	2800	300	250	900	800	400			17.0	4.4	7.6	26.8		
26	4753	16	8	217.8	218		2.6	3100	3100	2800	500	400	500	400	300	250		17.0	6.7	7.8	49.0	6.0	
27	4571																						
28	4415																					9.0	
29	4728																						
30	5005																						
TOTAL	149901																						
MIN	4036	15.0	7.90	130	126			2600		2700	300	200	500	400	300	250	0				7.4	2.8	3.8
MAX	8241	17.0	8.50	250	1722			4300		4700	950	900	990	980	960	920	25	20			7.9	575.0	9.0
AVE	4997	16.0	8.16	199	353			3263		3459	544	464	873	815	676	603	25	11			7.8	79.4	6.0

Peak Flow	219 l/s	Peak One Hour	207 l/s	Peak Four Hour	176 l/s
BOD Removed (kg)	28978	Sludge removed	24,630	Kg Hauled	
OTHER NUTRIENTS (mg/l)					
		TKN	67.7	RAW SEWAGE	TREATED EFFLUENT
		PHOSPHORUS	6.5		27.0
		Ortho Total	7.5		4.2
		AMMONIA as NH3	25.7		6.2
		COD	447		5.6
					37.7

Estevan WWTP Summary

Month of Jul-15

Date	Flow Est. M3	Influent				SS mg/l	sludge %	D.O. Cell 3	Mixed Liquor					R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Effluent						
		Temp C	pH	BOD mg/l	VSS mg/l				MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell 3 30 min	Set.Solids Cell 3 60 min			Set.Solids Cell 4 30 min	Set.Solids Cell 4 60 min	Set.Solids Cell 5 30 min	Set.Solids Cell 5 60 min	Temp C	D.O mg/l	pH
1	4538	18.7	8	181	54	5.1	3100	3800	2800	810	700	900	870	900	820	15	15	19.7	5.1	7.7	30.8	
2	4603	15.7	7.9	181	90	4.5	3400	4100	3600	890	760	970	840	940	810			17.9	4.8	7.4	14.0	
3	4603	20.3	7.8		68	4.4	3400	4000	3100	950	860	970	920	930	780			19.5	5.1	7.3	14.8	
4	4268																					
5	4237				258	3.3	3300	4600	3700	800	650	950	850	950	850	15	15	17.0	3.6	7.5	14.9	
6	4524	16	8		352	3	3200	4700	3600	800	600	950	900	900	800			18.0	4.1	7.6	11.6	
7	4564	16	8.1		264	3.1	3200	4600	3600	800	600	950	900	900	800			16.0	5.0	7.4	45.2	
8	4456	17	7.8		242	3.4	3600	4000	3700	850	700	900	800	900	800			17.0	5.2	7.5	5.2	
9	4483	17	7.8		304	3.1	3400	4100	3800	800	700	950	850	950	800			18.0	2.8	7.2	9.2	
10	4371	18	7.7	170						800	700	950	850	950	800							
11	4181																					
12	4192																					
13	4572	18	7.6		598	10.6	3	3300	4600	4200	900	600	950	900	950	15	15	19.0	3.0	7.3	7.2	
14	4569	19	7.7		422	1.3	3600	5200	4100	900	700	980	950	900	700			19.0	3.6	7.3	10.8	
15	4557	19	7.8		290	2.4	3900	5100	4200	900	800	950	900	950	800			19.0	6.3	7.3	14.0	
16	4487	20	7.7		216	1	3700	5700	4200	900	800	980	950	950	850			19.0	3.8	7.4	13.6	
17	4442	19	7.8	96	266	9.9	0.9	4100	5900	4400	950	900	950	980	900			19.0	5.5	7.4	37.6	
18	4087																					
19	4077																					
20	4366	19	7.6		582	0.6	3700	5600	4400	900	800	950	900	950	900			19.0	3.2	7.2	24.0	
21	4536	19	7.6		454	3.9	3600	5100	4600	950	850	980	950	950	950			19.0	3.0	7.3	12.4	
22	4482	19	7.5		764	4	3500	5000	4000	950	850	980	950	950	750			19.0	2.8	7.1	6.4	
23	4447	19	7.6		1568	4.2	3700	4500	4200	950	700	950	850	980	700			19.0	3.1	7.2	26.0	
24	4544	19	7.7		356			3700	4800	4400	950	900	980	950	900			19.0		7.5	4.4	
25	4193																					
26	4283																					
27	4532	20	7.7		336	8.6		3600	4800	4400	950	900	980	960	970			20.0		7.2	31.2	
28	4526	20	7.8		592			3300	5100	4600	900	800	990	950	960			20.0		7.4	4.0	
29	4354	20	7.8		254	13.7		3200	5000	3900	900	850	980	980	950			21.0		7.5	13.2	
30	4363	20	7.8		228			3200	4800	3900	900	800	980	950	950			21.0		7.5	6.4	
31	4240	20	7.7		214			3200	4300	3700	900	800	950	870	890			21.0		7.4	12.0	
TOTAL	136677																					
MIN	4077	15.7	7.50	96	54			3100	2800	800	600	900	800	900	700	25	15			7.1	4.0	3.2
MAX	4603	20.3	8.10	181	1568			4100	4600	950	900	980	980	980	970	25	15			7.7	45.2	13.0
AVE	4409	18.6	7.76	149	381			3474	3961	891	766	960	908	946	849	25	15			7.4	16.0	6.6

Peak Flow	146 l/s	Peak One Hour	98 l/s	Peak Four Hour	75 l/s	OTHER NUTRIENTS (mg/l)
BOD Removed (kg)	19467	Sludge removed	111,170 Kg Hauled			RAW SEWAGE
TKN	51.6					TREATED EFFLUENT
PHOSPHORUS	6.0					
Ortho Total	8.8					
AMMONIA as NH3	25.2					
COD	557					

Estevan WWTP Summary

Month of Aug-15

Date	Flow Est. M3	Influent				Mixed Liquor										Effluent							
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Sat.Solids Cell3 30 min	Sat.Solids Cell3 60 min	Sat.Solids Cell4 30 min	Sat.Solids Cell5 60 min	R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D.O. mg/l	pH	S.S. Composite	BOD Composite	
1	3960																						
2	3835																						
3	4038																						
4	4248	19	7.8			520	9.5	3.2	3300	4800	4000	900	800	980	920	970	900	15	23.0	3.0	7.5	1.6	
5	4250	19	7.9			740		4.1	3700	4600	4200	900	850	980	950	960	900		20.0	5.0	7.5	4.4	
6	4156	19	7.7			162		3	3400	4900	4200	850	700	990	900	960	900		19.0	2.8	7.3	7.2	
7	4144	20	7.8	150		150		2	3500	4800	4200	900	650	980	850	970	800		20.0	3.0	7.4	8.8	2.2
8	3968																						
9	4018																						
10	4376	20	7.6			1006	4.9	0.6	3700	4700	4300	900	800	950	900	950	900	15	20.0	3.5	7.4	6.0	
11	4215	20	7.7			878		0.8	3600	5400	4400	850	750	990	950	900	900		20.0	3.0	7.6	1.6	
12	3982	21	7.7			458		1.6	3500	5000	4400	800	750	980	960	950	900		21.0	3.0	7.5	4.0	
13	4361	20	7.8			28		2.2	3800	4400	3600	900	850	960	950	800	700		23.0	4.9	7.6	3.6	
14	4415	21	7.8	195		342	21.3	1.8	3900	4500	3400	900	600	960	830	750	550		23.0	4.1	7.5	16.8	3.5
15	4027																						
16	4010																						
17	4211	20	7.8			268		2.5	3400	4800	3700	750	950	950	900	900	850	15	20.0	2.8	7.6	2.8	
18	4184	20	7.7			182		2.8	3600	4800	3400	800	700	900	700	850	700		20.0	3.2	7.3	3.2	
19	4103	20	7.7			138	10	2.4	3600	5000	3700	900	800	950	900	900	750		20.0	6.4	7.7	42.0	
20	4192	20	7.8			230		2.4	3800	6200	4700	900	850	900	750	980	900		20.0	2.9	7.3	19.2	
21	4032	20	7.8	210		998		2	3800	5200	4700	850	750	980	950	950	900	20	20.0	2.7	7.4	8.4	4.2
22	5603																						
23	4253																						
24	4292	20	7.8			220		3.2	3700			910	820										
25	4424	19	7.9			400		4.8	4000	4800	3900	950	860	970	930	940	860		19.0	4.0	7.4	21.6	
26	4486	20	7.7			364		1.8	3700	5100	4400	900	750	950	900	950	650		20.0	7.2	4.2	13.6	
27	4343	19	7.9			394		3.1	4200	4500	3900	900	750	950	900	900	800		20.0	3.6	3.6	4.8	
28	4248	19	7.8	210		852	10	1.9	4100	5100	3800	950	900	980	950	950	800		20.0	7.0	7.0	16.0	8.0
29	4076																						
30	4206																						
31	5110	20	7.8			330		0.8	3700	5900	4600	850	750	980	980	950	900	15	20.0	3.9	7.5	7.6	
TOTAL	131767																						
MIN	3835	19.0	7.60	150		28			3300			750	600	900	700	750	550	25	15		3.6	1.6	2.2
MAX	5603	21.0	7.90	210		1006			4200			980	950	990	980	980	900	25	20		7.7	42.0	8.0
AVE	4251	19.8	7.78	191		433			3700			819	782	962	898	923	819	25	17		7.1	10.4	4.5

Peak Flow	195 l/s	Peak One Hour	119 l/s	Peak Four Hour	109 l/s	OTHER NUTRIENTS (mg/l)	RAW SEWAGE	TREATED EFFLUENT
BOD Removed (kg)	24611	Sludge removed	44,920 Kg Hauled			TKN	89.8	39.0
						PHOSPHORUS	7.2	3.8
						Ortho Total	8.8	4.7
						AMMONIA as NH3	35.2	0.2
						COD	709	28.8

Estevan WWTP Summary

Month of Sep-15

Date	Flow Est. M3	Influent				Mixed Liquor										Effluent							
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Sat.Solids Cell3 30 min	Sat.Solids Cell4 60 min	Sat.Solids Cell5 60 min	R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D.O. mg/l	pH	S.S Composite	BOD Composite		
1	4970	20	7.7			442		3	4300	5700	4000	900	850	990	950	850	750	20.0	6.0	7.6	21.2		
2	4970	20	7.9		54	170	13	3.3	3800	5700	4300	900	800	980	950	900	900	22.0	3.0	7.8	18.0		
3	4970	21	6.9			830		1.8	3700	5600	4500	850	650	980	920	950	900	21.0	3.1	7.7	10.0		
4	4970	20	7.7			434		3	4100	5300	4600	800	750	920	900	950	900	20.0	3.4	7.7	11.2	1.0	
5	4970																						
6	4970																						
7	4970																						
8	4970	19.5	8.2			186		4.5	3320	4070	3550	360	290	780	600	530	360	18.7	5.5	7.8	28.0		
9	4970	20	7.9			228	11.9	3.1	3300	4000	3200	500	400	700	500	300	300	19.0	4.1	7.6	19.6		
10	4970	19	7.8		86	208		4.2	3400	4100	3200	500	250	600	300	400	200	19.0	5.8	7.6	3.6	2.2	
11	4970																						
12	4970																						
13	5840																						
14	5045	19	7.8			176		4.2	3100	4200	3700	450	350	850	750	850	700	20.0	4.2	7.7	20.8		
15	5145	19	7.8		60	720	14.8	3.5	3100	4300	3700	300	250	500	400	500	400	19.0	4.4	7.5	10.8		
16	5207	20	7.9		182	422		3.2	3400	4500	3900	400	200	900	700	600	600	19.0	3.3	7.5	8.8		
17	5359	20	7.8			118		2.6	3500	5200	4300	400	300	900	800	500	400	19.0	4.7	7.8	20.8		
18	4965	19	7.8			304	12.9	2.2	3700	5500	4000	650	450	950	850	800	600	19.0	3.4	7.4	8.4	2.8	
19	4759																						
20	4875																						
21	4975	20	7.8			240		2	4200	6400	4700	750	550	980	950	850	600	19.0	2.4	7.4	15.6		
22	4822	19	8.1		340	442	12.9	2.6	4000	6000	5200	850	500	950	700	950	700	18.0	3.1	7.3	3.6		
23	4837	19	7.8			372		2.6	3600	5600	5000	400	300	850	600	750	550	18.0	3.7	7.7	5.6		
24	4715	19	7.8			196	10.8	3.3	3500	5200	4800	400	200	950	800	700	700	20.0	3.6	7.7	9.2		
25	4879	19	7.8			110		2.9	3700	5400	4600	400	300	950	900	800	650	20.0	0.9	7.7	8.4	3.2	
26	4862																						
27	4897																						
28	4994	18	7.8		142	228		2.1	3400	3100	3100	400	200	450	200	450	200	0	18.0	3.2	7.6	0.4	
29	4751	20	7.8			144	14	1.6	4100	4400	3400	550	450	700	600	400	300	0	20.0	3.4	7.8	12.4	
30	4518	19	7.8			580		2.8	3900	4900	4000	400	350	750	500	450	400	20	20.0	6.3	7.7	4.8	
31																							
TOTAL	149102																						
MIN	4518	18.0	6.90	145		110			3100		3100	300	200	450	200	400	200	0		7.3	0.4	1.0	
MAX	5840	21.0	8.20	210		830			4300		5200	900	850	990	950	900	900	20		7.8	28.0	3.2	
AVE	4970	19.5	7.80	173		328			3656		4088	558	420	832	684	697	556	8		7.6	12.1	2.3	

Peak Flow	162 l/s	Peak One Hour	n/a l/s	Peak Four Hour	n/a l/s
BOD Removed (kg)	25377	Sludge removed	109,960	Kg Hauled	
OTHER NUTRIENTS (mg/l)					
TKN	65.6	RAW SEWAGE		TREATED EFFLUENT	16.1
PHOSPHORUS	5.7	Ortho Total			2.5
AMMONIA as NH3	7.6				3.1
	13.6				0.3
COD	484				30.5

Estevan WWTP Summary

Month of Oct-15

Date	Flow Est. M3	Influent				SS mg/l	Sludge %	Mixed Liquor										Effluent						
		Temp C	pH	BOD mg/l	VSS mg/l			D.O. Cell.3	MLSS.3 mg/l	MLSS.4 mg/l	MLSS.5 mg/l	Sol. Solids Cell3 30 min	Sol. Solids Cell3 60 min	Sol. Solids Cell4 30 min	Sol. Solids Cell4 60 min	Sol. Solids Cell5 30 min	Sol. Solids Cell5 60 min	R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D.O. mg/l	pH	S.S. Compost	BOD Compost
1	4173	19	7.1	362	248	9.9		3.8	3500	3500	2800	300	250	300	250	200	250	20	25	19.0	3.0	7.4	5.2	11.5
2	4748	17	7.8	280																18.0	4.4	7.7	17.2	
3	5215																							
4	5080																							
5	5052	18	7.7	222				2.9	3800	4700	4300	550	400	900	800	900	5	25	18.0	3.2	7.4	4.4		
6	4959	18	7.7	290				2.1	3200	5600	4200	400	300	950	800	800	15	15	18.0	2.7	7.7	4.8		
7	4928	18	7.9	146				5.9	4200	5000	4200	500	300	700	600	400			18.0	5.1	7.6	1.2		
8	4852	18	8	356				5.7	3900	4900	4000	600	300	800	350	550			18.0	5.5	7.7	4.8		
9	4906	18	7.9	442				6.7	4100	4800	4200	650	450	850	550	650			18.0	4.3	7.6	20.8	3.0	
10	4745																							
11	4534																							
12	4579	19	7.8	84				3.8	4200	5700	4600	750	570	940	830	800			17.0	5.4	7.8	8.4		
13	4676	18	8.1	182				5.8	4300	5400	4400	780	600	880	750	800			17.0	5.6	7.7	18.0		
14	4625	18	8.1	144				6	4400	5360	4700	570	400	860	770	820			17.0	5.7	7.6	20.0	3.0	
15	4561	18	8	175				6.6	4340	5250	4300	580	400	820	660	670			17.0	6.4	7.7	12.8		
16	4517	19	8.2	150																				
17	4498																							
18	4717																							
19	4596	18	7.8	176				3.8	4000	5400	4400	650	410	700	500	850			20.0	3.4	7.6	9.6		
20	4571	17	7.8	102				3.8	4100	5300	5000	600	500	650	500	900			17.0	3.9	7.5	3.6		
21	4569	17	7.8	192				2.7	4500	6300	5300	800	400	950	800	900			17.0	4.3	7.6	6.4		
22	4589	18	7.8	118				2	4200	6500	5400	800	500	980	900	950			18.0	3.9	7.5	5.6		
23	4689	17	7.8	138				2.4	4800	5900	5400	900	800	950	900	950			17.0	4.6	7.5	4.0	1.5	
24	4477																							
25	4546																							
26	4512	17	7.9	828				2	4400	6500	5800	750	600	850	900	850			17.0	3.5	7.7	3.2		
27	4561	17	7.8	272				3.6	4500	6900	5500	800	500	950	900	850			17.0	3.0	7.6	14.4		
28	4482	17	7.9	458				3.1	4900	6500	5500	850	700	900	800	950			16.0	3.9	7.7	2.8		
29	4614	17	8.1	218				4.5	4700	6300	5300	800	400	900	800	750			16.0	6.3	7.8	15.4		
30	4661	17	7.7	376				1.8	4300	6200	5300	700	350	900	800	800			17.0	3.2	7.7	4.8	5.5	
31	4910																							
TOTAL	145064																							
MIN	4173	17.0	7.10	95					2400		2100	300	250	200	200	250	25	5				7.4	1.2	1.5
MAX	5215	19.0	8.20	280					4900		5800	900	800	900	900	950	900	20	20			7.8	20.8	11.5
AVE	4680	17.7	7.84	168					4130		4605	649	447	823	693	759	590	25	12			7.6	8.9	4.9

Peak Flow	178 l/s	Peak One Hour	104 l/s	Peak Four Hour	78 l/s
BOD Removed (kg)	23663	Sludge removed	89,140 Kg Hauled		

OTHER NUTRIENTS (mg/l)		RAW SEWAGE	TREATED EFFLUENT
TKN	60.0		15.3
PHOSPHORUS	6.2		2.1
Ortho Total	6.9		2.6
AMMONIA as NH3	36.7		0.3
COD	440		21.0

Estevan WWTP Summary

Month of Nov-15

Date	Flow Est. M3	Influent				Mixed Liquor										R.A.S.		Effluent				
		Temp C	pH	BOD mg/l	VSS mg/l	SS mg/l	sludge %	D.O. Cell 3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set Solids Cell3 30 min	Set Solids Cell4 30 min	Set Solids Cell5 60 min	Time/Cycle min	Time/Cycle min	Temp C	D.O. mg/l	pH	SS Composite	BOD Composite	
1	4805																					
2	4532	17	7.8			272	9.6	3.4	4900	6200	800	600	950	850	900	800	17.0	4.3	7.8	0.8		
3	4655	17	7.8			194		3	4900	6300	5500	850	850	850	750	850	17.0	3.9	7.4	6.8		
4	4566	17	7.8			184		1.7	5100	6600	5900	900	900	800	800	600	17.0	4.2	7.6	10.4		
5	4865	17	8			172		4.4	4600	6900	6200	700	450	950	800	800	16.0	3.4	7.6	5.6		
6	4814	16	8	160		736		4.7	4600	6400	5800	800	700	950	900	850	16.0	5.0	7.7	14.4	2.0	
7	4618																					
8	4652																					
9	4689	16	8			362	9.5	2	4800	6300	5600	750	700	900	850	850	16.0	4.9	7.6	2.0		
10	4506	16	8			452		2.8	5100	6300	5700	800	600	900	850	700	16.0	4.9	7.6	2.8		
11	4507																					
12	4458	16	7.8			312	8.2	2.8	5800	7200	5800	800	650	900	800	800	15.0	4.7	7.7	2.8		
13	4463	16	7.9	210		462		4.6	4600	7500	5800	750	450	950	900	650	16.0	3.9	7.7	11.6	3.5	
14	4512																					
15	4466																					
16	4482	16	7.8			268		2.8	4600	7400	6400	800	700	950	900	700	16.0	5.6	7.5	4.8		
17	4343	16	7.8			620	10	2.1									16.0	3.4	7.6	17.2		
18	4495	16	7.9			578		2.6	5400	6700	6000	850	700	900	850	800	16.0	4.7	7.5	7.2		
19	4339	16	7.9			220		6.8	5200	6000	850	550	950	750	800	750	13.0	5.4	7.7	13.6		
20	4334	16	7.9	75		36		7.5	5300	5900	4900	880	680	870	690	530	13.0	7.3	7.5	18.8	3.8	
21	4174																					
22	4285																					
23	4278	16	7.9			176	14.4	4.1	4300	4000	3800	400	550	400	500	350	14.0	5.0	7.7	7.6		
24	4251	14	7.9			570		2.4	4200	4700	4000	400	300	500	400	300	14.0	3.7	7.6	3.2		
25	4277	14	7.9			436	9.8	5	4000	5100	4200	400	300	750	600	400	13.0	5.0	7.6	2.0		
26	4227	14	7.9			222	9.9	4.1	3900	5000	4000	400	300	850	750	600	14.0	4.7	7.6	12.0		
27	4178	14	7.9	260		414		5.4	4000	5200	3900	400	350	900	700	550	14.0	5.1	7.6	18.0	3.5	
28	4306																					
29	4328																					
30	4310	12	8			236		3.6	4300	4600	4000	750	600	750	600	650	12.0	6.1	7.8	10.0		
TOTAL	133717																					
MIN	4174	12.0	7.80	75		36			3900		3800	400	300	500	400	450	300	0	0	7.4	0.8	2.0
MAX	4865	17.0	8.00	260		796			5800		6400	900	800	950	900	850	850	0	0	7.8	18.8	3.8
AVE	4457	15.6	7.90	176		360			4716		5172	707	549	862	755	771	629	#DIV/0!	#DIV/0!	7.6	8.6	3.2

Peak Flow	171 l/s	Peak One Hour	100 l/s	Peak Four Hour	76 l/s
BOD Removed (kg)	23140	Sludge removed	108,410 Kg Hauled		

OTHER NUTRIENTS (mg/l)		RAW SEWAGE	TREATED EFFLUENT
TKN	51.3		14.5
PHOSPHORUS	6.9		2.5
AMMONIA as NH3	8.8		3.5
	20.4		0.5
COD	317		25.8

Estevan WWTP Summary

Month of Dec-15

Date	Flow Est. M3	Influent				Mixed Liquor										Effluent						
		Temp C	pH	BOD mg/l	VSS mg/l	D.O. Cell.3	MLSS 3 mg/l	MLSS 4 mg/l	MLSS 5 mg/l	Set.Solids Cell3 30 min	Set.Solids Cell3 60 min	Set.Solids Cell4 30 min	Set.Solids Cell4 60 min	Set.Solids Cell5 30 min	Set.Solids Cell5 60 min	R.A.S. Time/Cycle min	W.A.S. Time/Cycle min	Temp C	D.O. mg/l	P.H	SS Compaete	BOD Compaete
1	4250	14	8	314	226	3.7	4000	5400	4000	750	400	900	800	400	400			14.0	4.2	7.8	6.8	
2	4319	14	8	328		4.2	4200	4900	4200	400	400	600	600	400	400			14.0	5.6	7.7	7.6	
3	4162	16.6	8	8		5.8	4600	4700	4300	570	370	670	420	640	440			14.0	6.5	7.6	2.4	
4	4223	15	8	114		3.1	4400	5900	4400	600	450	900	800	700	500			15.0	4.7	7.7	2.0	10.8
5	4098																					
6	4240																					
7	4272	15	8	360	314	4.3	4400	6000	5200	650	400	800	550	600	500			15.0	4.7	7.8	4.4	
8	4197	15	8	386		3.7	4600	6500	5400	700	500	900	800	800	530			16.0	5.2	7.8	7.6	
9	4153	15	8.1	352		3	4500	6400	5100	700	500	850	700	750	500			16.0	4.9	7.8	12.8	
10	4171	15	8	210		4.2	5000	6500	5700	800	600	900	800	800	600			16.0	5.2	7.7	13.6	
11	4107	14	7.8	105		3	5000	6000	5800	800	600	900	700	900	700			14.0	5.1	7.6	17.2	3.2
12	4095																					
13	4219																					
14	4237	14	7.8	114	94	2.78	5000	7000	6400	800	700	950	800	950	800			14.0	3.7	7.1	6.8	
15	4191	14	7.8	872		1.9	5200		6500	700	500	850	700	900	750	25	15	15.0	3.6	7.3	2.4	
16	4099	14	8.8	1672		4	5100	6800	6000	750	550	700	550	700	550			13.0	4.2	7.8	1.2	
17	4033	14	7.8	260		4.2	5000	6800	5900	700	600	950	850	850	750			12.0	4.2	7.3	2.0	
18	4205	14	7.7	240		3.8	4800	6100	5700	450	400	750	700	750	600			11.0	5.4	7.2	15.2	2.5
19	4006																					
20	4016																					
21	4079	14	7.7	260		2.4	4300	5600	4900	800	500	950	800	850	600			13.0	3.5	7.1	7.6	
22	4104	14	7.6	184		4	4600	5300	5200	850	400	850	700	650	500			14.0	4.6	7.1	14.4	
23	4238	14	7.7	236	192	4.2	4300	5800	4600	700	400	950	800	850	550			14.0	5.7	7.1	4.8	
24	3895	14	7.8	268		4.8	4600	4700	4400	650	500	650	550	750	600			13.0	5.4	7.2	18.0	5.5
25	3558																					
26	3704																					
27	3680																					
28	3865																					
29	3909	13	7.7	226		4.2	3700	4300	3800	450	400	400	350	700	600			13.0	5.3	7.1	6.4	
30	3944	14	7.7	258		4.1	4000	4500	4000	700	400	850	500	700	400			13.0	3.9	7.2	10.0	
31	4021	13	7.6	298	254	2.4	3700	4900	4600	550	300	900	700	700	600			12.0	3.4	7.1	9.6	1.5
TOTAL	126289																					
MIN	3558	13.0	7.60	80			3700		3800	450	300	400	350	600	400	25	15				7.1	1.2
MAX	4319	16.6	8.80	395			5200		6500	850	700	950	850	950	850	25	15				7.8	18.0
AVE	4074	14.3	7.89	212	342		4524		5052	686	470	835	681	770	580	25	15				7.4	8.2

OTHER NUTRIENTS (mg/l)

BOD Removed (kg)	Sludge removed	65,520 Kg Hauled	Peak Flow		Peak Four Hour		RAW SEWAGE		TREATED EFFLUENT	
			219 l/s	93 l/s	71 l/s					
			TKN	57.0				15.5		
			PHOSPHORUS	5.7				1.9		
			Ortho Total	7.4				3.0		
			AMMONIA as NH3	25.0				0.1		
			COD	469				28.3		