TOWN OF OKOTOKS

WASTEWATER SYSTEM

2017 ANNUAL REPORT

Approval # 1028-03-00

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1. Wastewater System Introduction

EPCOR Water Services have prepared the Water and Wastewater Annual reports on behalf of the Town of Okotoks. EPCOR and the Town of Okotoks have entered into an agreement to operate and maintain the wastewater system in Okotoks which commenced as of June 1st, 2005. The current wastewater treatment facility is a Level IV Tertiary BNR (biological nutrient removal) treatment process with continuous discharge to the Sheep River.

2. EPCOR Quality Assurance Program

The EPCOR Water Services Quality Assurance Program for external sites is intended to be part of a larger overall company Quality Management System which ensures that the utility:

- can demonstrate that it can consistently meet regulatory requirements
- can demonstrate that it can meet internal operational requirements
- can enhance customer protection through effective application of a quality system
- Continuously improves the overall quality system.

The EPCOR QA program is in place to ensure that water and wastewater quality data is reliable and technically (and legally) defensible, data is reported correctly, violations are reported in a timely manner, approval requirements are met, and water or wastewater quality problems are responded to effectively. For external and internal audit purposes EPCOR must be also be able to demonstrate that:

- it is doing what it says it is doing in all of its operations and it is has the documentation to back this claim up,
- data, and procedures for generating data, are verified by a qualified group that is independent of operations, and
- It is exercising due diligence by requiring that a reasonable level of quality assurance is in place at all external sites, and not only at the Edmonton operations.
- Has identified risks to the utility and has prepared remedial action plans for improvements.

An acceptable defined level of quality assurance on operational performance is specifically required by the EPCOR Risk Management Internal Audit.

Components of the External Sites QA Program

To satisfy these general requirements, the EPCOR Water Services Quality Assurance section will act as an auditor independent of operational management at each external site. The goal is to ensure that data is produced, recorded and reported in manners that are consistent with ISO 17025 requirements.

The components of the quality assurance program will include:

1. Initial QA assessments of new sites.
2. Ongoing routine site QA audits.
3. Preparation of audit reports and follow-up.
4. Analysis of EPCOR internal monthly Proficiency Testing (PT) samples.
5. Review of monthly and annual utility performance reports.
6. Tracking and review of site incident reports.
7. Development and review of site cross-connection control program (CCC).
8. Development and review of site watershed protection programs.
9. Training of operators at external sites on analytical procedures as required.

The plan and procedures will be reviewed regularly, at least on an annual basis, and amended as necessary.

3. Summary of WWTP Untreated Wastewater Influent: Monthly Summaries; BOD/TSS/Volume; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : BOD_5 - TSS - VOLUME												
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
BOD_5	mg/L	Once per day	Composite	Entering WWTP	MIN	291	320	248	230	280	244	224
					MAX	752	501	551	635	671	678	549
					AVG	484	407	413	403	414	411	407
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	260	260	248	248	252	224	208
					MAX	510	496	504	1028	740	474	418
					AVG	324	309	313	334	322	308	303
VOLUME	m^3/day	Once per day	Continuous	Entering WWTP	MIN	5932	6090	6292	6151	6297	6373	5976
					MAX	7026	7249	7131	7764	7635	7839	7053
					AVG	6529	6523	6573	6703	7013	7051	6421
					TOTAL	202397	182655	203770	201098	217408	211515	199046
BOD_5 - Biochemical Oxygen Demand **TSS - Total Suspended Solids**												

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : BOD_5 - TSS - VOLUME											
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
BOD_5	mg/L	Once per day	Composite	Entering WWTP	MIN	265	220	302	295	329	**220**
					MAX	738	717	620	681	530	**752**
					AVG	373	409	441	428	411	**417**
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	248	272	272	260	276	**208**
					MAX	1584	876	552	508	356	**1584**
					AVG	375	424	329	331	309	**332**
VOLUME	m^3/day	Once per day	Continuous	Entering WWTP	MIN	5656	5728	5941	6140	6630	**5656**
					MAX	6402	6880	6882	7547	7424	**7839**
					AVG	6043	6309	6417	6876	6899	**6613**
					TOTAL	187337	189267	198927	206290	213857	**2413567**
BOD5 - Biochemical Oxygen Demand **TSS - Total Suspended Solids**											

4. Summary of WWTP Untreated Wastewater Influent: Monthly Summaries; Ammonia/Total Phosphorus; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : AMMONIA - TOTAL PHOSPHORUS												
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**
Ammonia - Nitrogen	mg/L	Once per week	Composite	Entering WWTP	MIN	31.8	29.2	33.2	11.9	25.3	29.6	25.7
					MAX	37.3	38.8	39.3	37.0	33.9	36.3	36.5
					AVG	34.3	34.2	36.3	32.4	30.9	32.4	29.7
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	4.60	6.10	6.35	5.80	5.35	5.30	5.40
					MAX	7.70	7.70	7.80	22.20	8.90	8.45	7.40
					AVG	6.87	6.82	6.94	7.29	6.57	6.48	6.34

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System Untreated Wastewater (Raw Influent) : AMMONIA - TOTAL PHOSPHORUS											
Parameter	**Units of Measure**	**Frequency**	**Sample Type**	**Sampling Location**		**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Ammonia - Nitrogen	mg/L	Once per week	Composite	Entering WWTP	MIN	29.0	28.8	32.3	31.2	35.1	**11.9**
					MAX	42.6	39.4	39.9	39.4	40.1	**42.6**
					AVG	33.6	35.6	36.7	35.2	37.2	**34.0**
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	6.10	5.20	6.15	5.25	5.80	**4.60**
					MAX	8.90	10.40	8.05	7.65	8.65	**22.20**
					AVG	7.00	7.09	7.10	6.70	6.99	**6.85**

5. Summary of WWTP Parameters: Treated Wastewater Effluent: Monthly Summaries; BOD/CBOD/TSS/Volume; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: BOD_5 - $CBOD_5$ - TSS - VOLUME

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
BOD_5 MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	< 2.0	< 2.0	< 2.0	< 2.0	2.3	2.0	< 2.0
						MAX	3.9	3.7	5.5	5.7	6.4	8.4	6.0
						AVG	2.4	2.4	2.8	3.6	4.0	4.1	2.8
$CBOD_5$ MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 20 mg/L	MIN	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
						MAX	2.1	2.0	3.1	3.6	2.5	2.7	2.1
						AVG	2.0	2.0	2.0	2.1	2.0	2.1	2.0
TSS MDL : 2.5 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 15 mg/L	MIN	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
						MAX	< 2.5	< 2.5	< 2.5	3.1	3.6	10.5	5.8
						AVG	< 2.5	< 2.5	< 2.5	2.6	2.7	4.4	2.8
VOLUME	m^3/day	Once per day	Continuous	Prior to Release	N/A	MIN	6016	6099	6111	5944	6032	6676	6238
						MAX	7088	7233	7025	7726	7579	7923	7048
						AVG	6497	6471	6380	6549	6859	7129	6542
						TOTAL	201401	181195	197789	196472	212635	213855	202798

BOD_5 - Biochemical Oxygen Demand
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand
TSS - Total Suspended Solids

< TSS Estimate : Less than 2.5 mg was retained on the filter

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: BOD_5 - $CBOD_5$ - TSS - VOLUME

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
BOD_5 MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	< 2.0	< 2.0	< 2.0	< 2.0	2.2	< **2.0**
						MAX	4.4	5.3	5.7	5.0	4.6	**8.4**
						AVG	2.6	2.5	3.2	3.1	3.2	**3.1**
$CBOD_5$ MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 20 mg/L	MIN	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< **2.0**
						MAX	2.4	2.2	3.4	4.0	3.4	**4.0**
						AVG	2.1	2.0	2.2	2.1	2.3	**2.1**
TSS MDL : 2.5 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 15 mg/L	MIN	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< **2.5**
						MAX	< 2.5	2.5	3.8	2.5	< 2.5	**10.5**
						AVG	< 2.5	2.5	2.6	2.5	< 2.5	**2.7**
VOLUME	m^3/day	Once per day	Continuous	Prior to Release	N/A	MIN	5888	6086	5941	6109	6168	**5888**
						MAX	9318	6973	7055	7139	7106	**9318**
						AVG	6350	6421	6473	6478	6497	**6554**
						TOTAL	196858	192622	200665	194337	201399	**2392026**

BOD_5 - Biochemical Oxygen Demand
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand
TSS - Total Suspended Solids

< TSS Estimate : Less than 2.5 mg was retained on the filter

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: BOD_5 - $CBOD_5$ - TSS - VOLUME

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
BOD_5 MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	< 2.0	< 2.0	< 2.0	< 2.0	2.2	< **2.0**
						MAX	4.4	5.3	5.7	5.0	4.6	**8.4**
						AVG	2.6	2.5	3.2	3.1	3.2	**3.1**
$CBOD_5$ MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 20 mg/L	MIN	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< **2.0**
						MAX	2.4	2.2	3.4	4.0	3.4	**4.0**
						AVG	2.1	2.0	2.2	2.1	2.3	**2.1**
TSS MDL : 2.5 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 15 mg/L	MIN	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< **2.5**
						MAX	< 2.5	2.5	3.8	2.5	< 2.5	**10.5**
						AVG	< 2.5	2.5	2.6	2.5	< 2.5	**2.7**
VOLUME	m^3/day	Once per day	Continuous	Prior to Release	N/A	MIN	5888	6086	5941	6109	6168	**5888**
						MAX	9318	6973	7055	7139	7106	**9318**
						AVG	6350	6421	6473	6478	6497	**6554**
						TOTAL	196858	192622	200665	194337	201399	**2392026**

BOD_5 - Biochemical Oxygen Demand
$CBOD_5$ - Carbonaceous Biochemical Oxygen Demand
TSS - Total Suspended Solids

< TSS Estimate : Less than 2.5 mg was retained on the filter

6. Summary of WWTP Parameters: Treated Wastewater Effluent: Monthly Summaries; Ammonia/Total Phosphorus/Acute Lethality; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: AMMONIA - TOTAL PHOSPHORUS - ACUTE LETHALITY

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
Ammonia - Nitrogen MDL : 0.50 mg/L	mg/L	Once per day	Composite	Prior to Release	Oct 1 - Jun 30 ≤ 10 mg/L Jul 1 - Sep 30 ≤ 5mg/L	MIN	< 0.50	0.24	0.36	< 0.50	< 0.50	< 0.50	< 0.50
						MAX	1.30	2.04	2.61	2.20	1.30	2.20	0.55
						AVG	0.58	0.80	0.89	0.84	0.54	0.56	0.50
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.07	0.02	0.10	0.15	0.12	0.12	0.07
						MAX	0.15	0.16	0.16	0.38	0.36	0.52	0.34
						AVG	0.12	0.10	0.12	0.17	0.18	0.27	0.16
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A			> 100			> 100		

NOTE: **All samples tested for Acute Lethality in 2017 are reported as > 100 (Not Acutely Lethal).**

NOTE: **Ammonia - Nitrogen tests were performed at Exova Calgary from February 8/17 to March 16/17 due to lab equipment failure.**

NOTE: **TAN-MDL (Exova = 0.025 mg/L) MDL (Okotoks Lab = 0.50 mg/L)**

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: AMMONIA - TOTAL PHOSPHORUS - ACUTE LETHALITY

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
Ammonia - Nitrogen MDL : 0.50 mg/L	mg/L	Once per day	Composite	Prior to Release	Oct 1 - Jun 30 ≤ 10 mg/L Jul 1 - Sep 30 ≤ 5mg/L	MIN	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**0.24**
						MAX	< 0.50	< 0.50	0.63	3.90	0.80	**3.90**
						AVG	< 0.50	< 0.50	0.51	0.64	0.52	**0.61**
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.06	0.05	0.14	0.09	0.10	**0.02**
						MAX	0.26	0.32	0.32	0.31	0.22	**0.52**
						AVG	0.14	0.14	0.19	0.14	0.14	**0.16**
Acute Lethality Using Rainbow Trout	LC50 %	Once every 3 months	Grab	Prior to Release	N/A		> 100			> 100		**AVG** > **100**

NOTE **All samples tested for Acute Lethality in 2017 are reported as > 100 (Not Acutely Lethal).**

NOTE: **Ammonia - Nitrogen tests were performed at Exova Calgary from February 8/17 to March 16/17 due to lab equipment failure.**

NOTE: **TAN-MDL (Exova = 0.025 mg/L) MDL (Okotoks Lab = 0.50 mg/L)**

7. Summary of WWTP Parameters: Treated Wastewater Effluent: Monthly Summaries; Nitrogen Analysis; Approval 1028-03-00;

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: NITROGEN : TKN - NO_2 NO_3 - TN

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
TKN MDL : 0.07 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	0.83	1.65	1.35	1.43	1.41	0.07	1.04
						MAX	1.84	2.31	2.89	2.90	2.50	1.99	2.34
						AVG	1.45	1.88	1.90	1.89	1.70	1.32	1.60
NO_2 - NO_3 MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	5.70	5.20	4.08	2.65	3.34	5.00	5.04
						MAX	6.13	5.82	5.14	4.44	4.80	5.35	5.51
						AVG	5.96	5.54	4.71	3.62	3.90	5.18	5.32
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	6.53	7.06	5.71	4.80	4.75	5.19	6.55
						MAX	7.95	8.00	8.03	6.00	6.29	7.13	7.38
						AVG	7.41	7.41	6.61	5.50	5.59	6.50	6.92

TKN - Total Kjeldahl Nitrogen
NO_2 - NO_3 - Nitrite and Nitrate Nitrogen
TN - Total Nitrogen

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System

Treated Wastewater: NITROGEN : TKN - NO_2 NO_3 - TN

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
TKN MDL : 0.07 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	0.46	0.85	1.12	0.95	0.77	**0.07**
						MAX	2.58	2.05	4.20	2.79	1.81	**4.20**
						AVG	1.13	1.35	1.91	1.57	1.15	**1.57**
NO_2 - NO_3 MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	5.53	5.46	5.62	6.45	5.83	**2.65**
						MAX	6.00	6.01	7.10	6.72	6.45	**7.10**
						AVG	5.74	5.84	6.38	6.55	6.15	**5.41**
TN MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	≤ 15mg/L	MIN	6.40	6.73	7.06	7.40	6.89	**4.75**
						MAX	8.11	7.53	11.25	9.28	8.09	**11.25**
						AVG	6.87	7.18	8.29	8.11	7.35	**6.98**

TKN - Total Kjeldahl Nitrogen

NO_2 - NO_3 - Nitrite and Nitrate Nitrogen

TN - Total Nitrogen

8. Summary of WWTP Parameters: Total and Faecal Coliforms: Monthly Summaries; Approval 1028-03-00; Table 6-1

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: TOTAL & FAECAL COLIFORMS

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
Total Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 1000 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	3200	< 10	10	30	10	27	< 10
						Geometric Mean	42	< 10	10	13	10	13	< 10
Faecal Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 200 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	10	< 10	< 10	10	40	10	< 10
						Geometric Mean	10	< 10	< 10	10	13	10	< 10

NOTE #1 : Samples for coliform analysis are sent to the Provincial Health Lab on a weekly basis. Approval limit is based on the monthly geometric mean of weekly samples.
NOTE #2 : Possible contamination of Coliform test sent out on January 11/17. (provincial lab)

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System
Treated Wastewater: TOTAL & FAECAL COLIFORMS

Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
Total Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 1000 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	10	< 10	10	10	< 10	3200
						Geometric Mean	10	< 10	10	10	< 10	12
Faecal Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 200 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	< 10
						MAX	< 10	< 10	10	< 10	< 10	40
						Geometric Mean	< 10	< 10	10	< 10	< 10	10

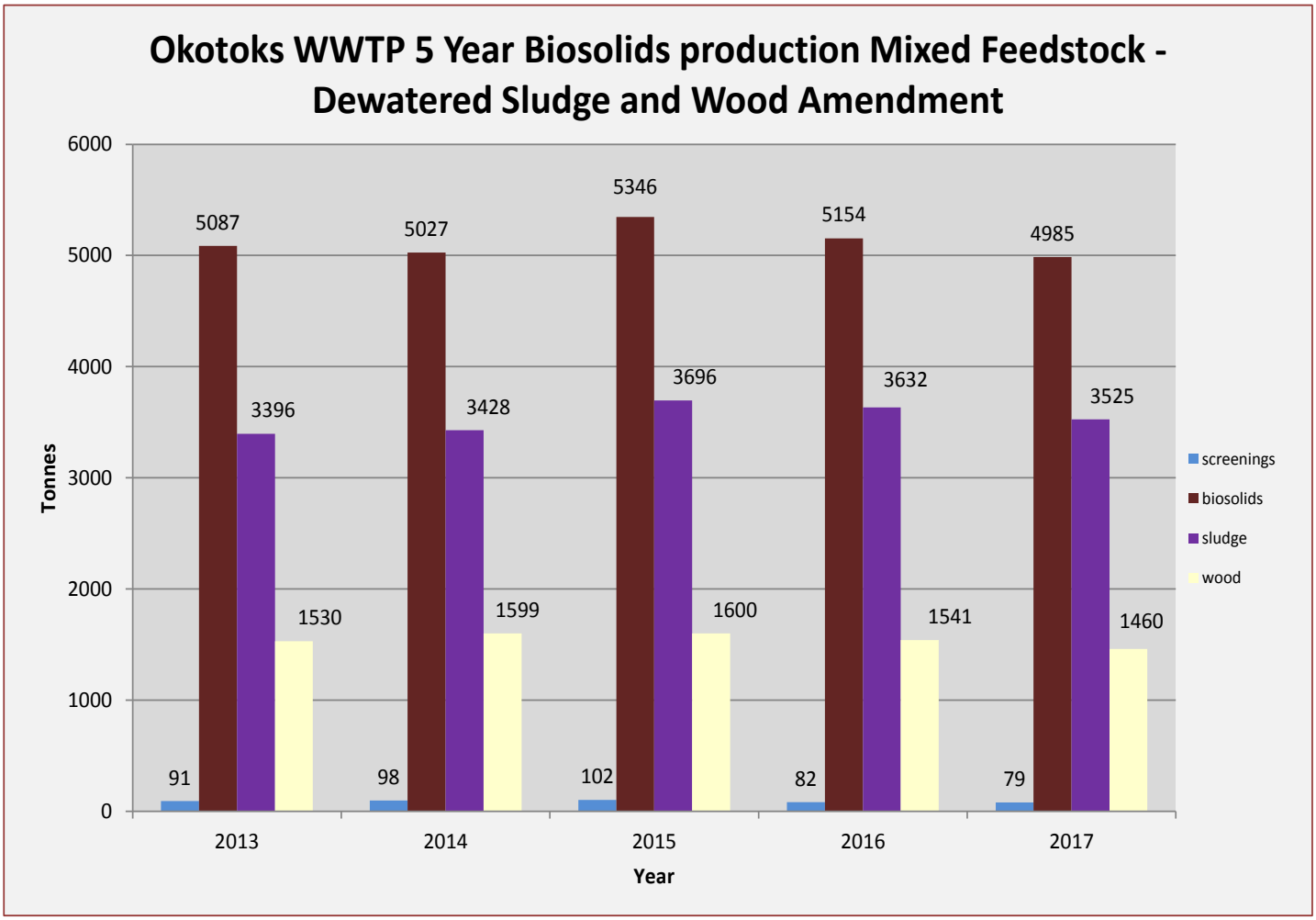
NOTE #1 : Samples for coliform analysis are sent to the Provincial Health Lab on a weekly basis. Approval limit is based on the monthly geometric mean of weekly samples.
NOTE #2 : Possible contamination of Coliform test sent out on January 11/17. (provincial lab)

9. Summary of WWTP Parameters: Sludge/Partially Composted Sludge: Monthly Summaries; Approval 1028-03-00; Table 6-1

EPCOR Water Services - Okotoks Wastewater Treatment Plant
2017 Annual Partially Composted Sludge Production MIN/MAX/AVG

	COMPOST FEEDSTOCK						SOLIDS SHIPPED FROM WWTP				
	Dewatered Sludge TOTAL	Dewatered Sludge MIN	Dewatered Sludge MAX	Wood Shavings Total	Wood Shavings MIN	Wood Shavings MAX	Mixed Feedstock to Regional Facility TOTAL	Mixed Feedstock to Regional Facility - MIN	Mixed Feedstock to Regional Facility - MAX	Raw Screenings to Regional Landfill TOTAL	General Notes
Month	Metric Tonnes						Metric Tonnes				1) Raw Screenings/Grit
JAN	279.0	0.0	13.7	117.1	0.0	5.7	396.1	0.0	19.4	9.2	hauled to landfill: kept separate
FEB	291.8	4.3	13.5	124.3	1.8	6.1	416.2	6.1	19.1	9.2	from Biosolids Compost.
MAR	334.0	8.1	14.5	145.2	3.4	6.5	479.2	11.5	21.0	7.2	
APR	312.8	4.3	16.7	138.0	2.0	7.6	450.8	6.3	24.3	5.7	2) All raw feedstock
MAY	325.2	7.5	13.8	141.6	3.4	6.2	466.8	10.9	20.0	6.4	(dewatered sludge & sawdust)
JUN	317.3	7.5	13.8	139.0	3.4	6.1	456.4	10.9	19.9	6.2	sent to approved regional compost
JUL	314.3	7.5	15.6	126.3	3.0	6.2	440.6	10.6	21.9	5.5	facility - EcoAg.
AUG	274.6	4.0	13.0	113.8	1.7	7.0	388.4	5.7	18.4	4.0	
SEP	275.5	2.8	13.0	111.2	1.5	5.4	386.7	4.4	18.2	6.3	3) Wood amendment supplied
OCT	287.2	7.4	13.4	106.4	2.9	4.6	393.6	10.5	17.9	6.8	by Spray Lakes Sawmills.
NOV	184.1	0.0	12.8	67.0	0.0	4.6	251.2	0.0	17.3	6.3	
DEC	328.6	3.5	14.6	130.0	1.7	6.4	458.6	5.2	20.5	6.2	
TOTAL	**3524.6**			**1460.0**			**4984.5**			**79.0**	
AVG	293.7			121.7			415.4			6.6	
MIN	184.1			67.0			251.2			4.0	
MAX	334.0			145.2			479.2			9.2	***WAS: Waste Activated Sludge***

10. Chart – WWTP: Five Year Biosolids Production



11. Summary of Incidents Reported to AEP – 2017

- **Jan 13** – A spill of approximately 50-100 liters of raw sewage occurred at the onsite Sani-Dump due to the discharge pumps not turning on while a Vac service truck was off loading. **(AEP #319940)**
- **Feb 24/25 –** Operator that was conducting lab test failed to add Influent sample to the BOD test bottles for the mentioned days, Was discovered on Mar. 2/3. **(AEP REF. #321629)**
- **June 15 –** Operators found that overnight the MSBR had foamed over and spilled foam onto the ground. The air supply was shut down stopping anymore foaming over and three vac trucks were called in to assist with the clean up**. (AEP Reference #325738)**
- **Oct. 25 –** Operations found after some investigating that the weekly Coliform test that is sent to the Provincial Lab (Calgary) was lost at their lab thus have no results to report for the week. **(AEP REF. #331787)**

12. Summary of Treated Wastewater used for Irrigation – 2017

There was no treated wastewater used for irrigation purposes in 2017.

13. WWTP Uncommitted Hydraulic Reserve Capacity – 2017-2021

WWTP Uncommitted Hydraulic Reserve Capacity

Municipality	Town of Okotoks	**Facility**	Okotoks Wastewater Treatment Plant
Supervising Operator	James McElmon	**Phone No.**	(403) 899-9343
Treatment Type	Mechanical – Tertiary BNR	**Design Capacity (m3/d)**	10,000

	Year	**2017**	***2018**	***2019**	***2020**	***2021**
Average Daily Flow - 2017	m3/d	6,613	7,132	7,327	7,522	7,716
Average Daily Flow Per Capita (F)	m3/capita/d	0.214	0.225	0.225	0.225	0.225
Hydraulic Reserve Capacity (Cr)	m3/d	3,387	2,868	2,673	2,478	2,284
Number of Unconnected Approved Lots (L)	lots	556	370	370	370	370
Connected Population (P)	persons	30,834	31,699	32,564	33,429	34,294
Number of Residential Connections (H)	connections	11,012	11,740	12,061	12,381	12,701
Committed Reserve (Com)	m3/d	334	225	225	225	225
Uncommitted Reserve Capacity (Cu)	m3/d	3,053	2,643	2,448	2,254	2,059

Cr = Design Capacity – Average Daily Flow

Cu = Cr – [L*F*P/H]

2017 connected Population is based on Federal census data

*Years 2018-2021 are estimates only

Future Pop is based on 5 yr annual avg growth rate of 865

Future Unconnected Approved Lots based on 5 yr avg

Future Res Connections is based on 2.8 people per connection

14. Summary of Chemicals Used - 2017

Summary of Chemicals Used in 2017				
MONTH	**Zetag 8190 Dry Polymer kg**	**ALUM kg**	**Sodium Hypochlorite 16% L**	**Sodium Sulfite - Dechlorination tablets Kg**
Jan	443	0	0	0
Feb	455	0	20	1
Mar	503	0	20	1
Apr	503	459	0	0
May	611	0	0	0
Jun	544	0	0	0
Jul	565	0	0	0
Aug	527	0	0	0
Sep	535	0	0	0
Oct	444	0	20	1
Nov	292	0	20	1
Dec	514	0	0	
TOTAL	**5935**	**459**	**80**	**4**

1 Dry Polymer used in Sludge Dewatering process

2 Sodium Hypochlorite used for cleaning Disk Filtration process (Not for Treatment)

3 Sodium Sulfite used for dechlorination after disk filter cleaning

4 Alum used for Chemical Phosphorus removal

15. Summary of WSER Testing – 2017

WSER Monitoring Requirements 2017 - Town of Okotoks WWTP										
Parameter										
Sample Type	24 Hour Composite									Grab
Parameter	CBOD		TSS		Un-ionized Ammonia					Acute Lethality
					Total Ammonia		pH @ 15 °C	Un-ionized Ammonia		
Environment Canada Limits	> or <	< 25 mg/L	> or <	< 25 mg/L	> or <			> or <	≤ 1.25 mg/L as N @ 15°C	<50%
Date										
11-Jan-17	<	4		2	<	0.025	7.55	<	**0.0002**	
25-Jan-17	<	4		3		0.069	7.53		**0.0006**	
9-Feb-17	<	4	<	1		0.468	7.66		**0.0058**	
22-Feb-17	<	4	<	1		0.322	7.48		**0.0027**	
8-Mar-17	<	4	<	1		0.509	7.62		**0.0058**	
22-Mar-17	<	4	<	2		0.670	7.80		**0.0114**	
										10-Feb-17
Q1 AVG	**<**	**4**		**2**		**0.344**	**7.61**		**0.0044**	**100%**
Q1 MIN	**<**	**4**	**<**	**1**	**<**	**0.025**	**7.48**	**<**	**0.0002**	
Q1 MAX	**<**	**4**		**3**		**0.670**	**7.80**		**0.0114**	
5-Apr-17	<	4		3		0.240	7.63		**0.0028**	
19-Apr-17	<	4		3		0.241	7.68		**0.0031**	
3-May-17	<	4	<	2		0.637	7.61		**0.0071**	
16-May-17	<	4	<	2		0.371	7.65		**0.0045**	
31-May-17	<	4		3		0.099	7.62		**0.0011**	
14-Jun-17	<	4	<	2		0.082	7.50		**0.0007**	
28-Jun-17	<	4		3	<	0.025	7.70	<	**0.0003**	
										15-May-17
Q2 AVG	**<**	**4**		**3**		**0.242**	**7.63**		**0.0028**	**100%**
Q2 MIN	**<**	**4**	**<**	**2**	**<**	**0.025**	**7.50**	**<**	**0.0003**	
Q2 MAX	**<**	**4**		**3**		**0.637**	**7.70**		**0.0071**	
12-Jul-17	<	4	<	2		0.030	7.77		**0.0005**	
26-Jul-17	<	4	<	1		0.031	7.87		**0.0006**	
9-Aug-17	<	4	<	2		0.089	7.70		**0.0012**	
24-Aug-17	<	4		30		0.070	7.74		**0.0010**	
6-Sep-17	<	4	<	2		0.064	7.78		**0.0010**	
20-Sep-17	<	4	<	2		0.040	7.91		**0.0009**	
										01-Aug-17
Q3 AVG	**<**	**4**		**7**		**0.054**	**7.80**		**0.0009**	**100%**
Q3 MIN	**<**	**4**	**<**	**1**		**0.030**	**7.70**		**0.0005**	
Q3 MAX	**<**	**4**		**30**		**0.089**	**7.91**		**0.0012**	
4-Oct-17	<	4		2		0.031	7.68		**0.0004**	
19-Oct-17	<	4		4		0.075	7.87		**0.0015**	
31-Oct-17	<	4		2		0.102	7.79		**0.0017**	
15-Nov-17	<	4	<	2		0.048	7.55		**0.0005**	
29-Nov-17	<	4	<	2		0.098	7.75		**0.0015**	
13-Dec-17	<	4	<	1		0.070	7.63		**0.0008**	
27-Dec-17	<	4		2		0.966	7.62		**0.0110**	
										14-Nov-17
Q4 AVG	**<**	**4**		**2**		**0.199**	**7.70**		**0.0025**	**100%**
Q4 MIN	**<**	**4**	**<**	**1**		**0.031**	**7.55**		**0.0004**	
Q4 MAX	**<**	**4**		**4**		**0.966**	**7.87**		**0.0110**	
Annual AVG	**<**	**4**		**3**		**0.210**	**7.68**		**0.0026**	
Annual MIN	**<**	**4**	**<**	**1**	**<**	**0.025**	**7.48**	**<**	**0.0002**	
Annual MAX	**<**	**4**		**30**		**0.966**	**7.91**		**0.0114**	

16. Summary of Operational Highlights & Problems

January 2017

- **Jan 9 –** Operations steamed out Primary sludge line due to blockage.
- **Jan 9** – Decreased WAS rate from 250 to 210 L/min to assist with flow accumulation.(operations)
- **Jan 10** – Operations having issues with Secondary high torque alarms due to ice buildup on the surface due to extreme cold temperatures.
- **Jan 13** – A spill of approximately 50-100 liters of raw sewage occurred at the onsite Sani-Dump due to the discharge pumps not turning on while a Vac service truck was off loading**. (AEP # 319940)**
- **Jan 14** – High Country Vac services called in to remove blockage in the Twas discharge causing operations not being able to run solids that day.
- **Jan 18** – Operations drained down Twas tank and performed scheduled maintenance and inspection of tank.

February 2017

- **Feb 3 –** Replaced mixer #1 in the anoxic zone of the bioreactor due to mixer failure.(operations)
- **Feb 8** – Disc filter #1 placed off line for scheduled cleaning and inspection.(operations)
- **Feb 8** – Foss distillation unit has failed once again forcing operations to send sub-samples for TAN to EXOVA Lab. (Calgary)
- **Feb 16** – Operations forced to turn off MSBR blower due to blower failure and sent to Barama industries (Calgary) for repair.
- **Feb 24/25** – Operator that was conducting lab test failed to add Influent sample to the BOD test bottles for the mentioned days, Was discovered on Mar. 2/3. **(AEP REF. #321629)**

March 2017

- **Mar 1** – Operations increased primary wasting from 32 m^3 to 36 m^3/day in efforts to lower primary sludge depth.
- **Mar 14** – Operations forced to remove Bioreactor mixer #2 due to mechanical failure, sent to Xylem for repair and placed shelf spare mixer in its place until original mixer is back onsite.
- **Mar 14** – Operator on call received callouts during the night due to air blower #1 high temperature faults was found to be a broken temperature sensor cable on the 15th by our maintenance crew and repairs were made.
- **Mar 16** – Started testing TAN onsite with VAPODEST 20s, prior to the 16th was sending subsamples weekly to Exova (Calgary)
- **Mar 18** – Operations increased primary wasting from 36 m^3 to 50 m^3/day due to a sudden increase of the sludge depth caused by warmer weather.
- **Mar 20** – Operations lowered primary wasting back down to 36 m^3/day as sludge levels have returned back to normal.
- **Mar 21** – Operations lowered the air scour flows at the Grit Vortex in attempts to collect and remove more grit and prior to primary treatment.
- **Mar 23** – Disc filter #2 was placed offline for scheduled cleaning and inspection and returned back into service on the 24th.
- **Mar 24** – Operations increased RAS rate to 90% due to secondary sludge depth at 10 feet. (normal = 2 foot)

April 2017

- **April 3 –** Unusually dark Influent composite sample collected the cause was ruled as a partial blockage in the river syphon causing high volumes of solids thru out the day.
- **April 10 –** Increased WAS rate from 260 L/min to 300 L/min in preparation for higher spring flows.
- **April 10 –** Increased Primary wasting from 32 m^3/D to 34 m^3/D due to increasing sludge depth.
- **April 12 –** Operator on call was called to the WWTP at 1:00 am due to a quick drop in power supply and was able to restore normal plant operations once on site.
- **April 27 –** Decreased WAS rate to 250 L/min from 280 L/min.

May 2017

- **May 11 –** Operations experienced a temporary drop in supply power to the plant and was forced to restart the plant to normal operations.
- **No other process changes or issues to report for the month of May.**

June 2017

- **June 3 –** Operator was called in at 2:00 am due to a drop in supply power causing the plant to briefly run on generator power, all systems were restored and back to normal operations by 2:40 am.
- **June 7 –** Lowered WAS rate from 300 L/min to 280 L/min due to a drop in MLSS.(operations)
- **June 7 –** SunTech electrical onsite to install new VFD for RAS pump #2.(contractor)
- **June 15 –** Operators found that overnight the MSBR had foamed over and spilled foam onto the ground. The air supply was shut down stopping anymore foaming over and three vac trucks were called in to assist with the clean up**.(AEP Reference # 325738)**

July 2017

- **July 2 –** Operator was called to the plant at 5:00 pm due to a UV PLC cabinet temperature fault.
- **July 5 –** Increased WAS rate from 300 L/min to 320 L/min to further assist with phosphorus removal.
- **July 21 –** lowered RAS rate from 120% to 100% of influent flow due to a low MLSS concentration.
- **July 31** – Operations was forced to restart parts the plant at 8:20 pm due to a very short disruption in power causing some of the PLC's to freeze up.

August 2017

- **Aug 8 –** Increased wasting from the primary clarifier from 32-34 m^3 /Day due to a high sludge blanket. (operations)
- **Aug 12** – Influent composite sampler failed forcing operations to take manual hourly samples till a spare unit could be delivered on site from Canmore.
- **Aug 24 –** Operations found an usually high concertation of solids in the Influent composite sample.

September 2017

- **Sept. 2 –** Operations continuing to have issues with overheating of the Bioreactor air blowers due to high outside temperatures causing temporary drops in DO levels.
- **Sept 10 –** Operations was forced to place air blower #4 online due to high DO demand in the bioreactor.

October 2017

- **Oct. 3** – Operations was called out at 3:00 am due to a UV PLC failure and had to reset both banks of lights.
- **Oct. 14 –** Operations cleaned Bioreactor DO probes due to low DO alarms.
- **Oct. 16 –** Operations increased RAS rate 90% to 110% to assist with Ammonia treatment.
- **Oct. 17 –** Operations preformed yearly scheduled cleaning of the Secondary Clarifier weir.
- **Oct. 18** – Operations placed Disc Filter #1 offline for a 24 hour routine inspection and cleaning.
- **Oct. 25 –** Operations found after some investigating that the weekly Coliform test that is sent to the Provincial Lab (Calgary) was lost at their lab thus have no results to report for the week. **(AEP REF.#331787)**

November 2017

- **Nov 12 –** Operations was called out due to a mechanical failure of the secondary clarifier skimmer arm causing the drive to go off on overload.
- **Nov 13 –** Canadian Underwater (divers) on site to inspect secondary clarifier arm and found a support brace had come lose and was repaired and placed clarifier back into service.
- **Nov 20 –** Disc Filter #3 placed off line for scheduled cleaning (48 hours).
- **Nov 20 –** Centrifuge sent to Edmonton for scheduled 5 year service.
- **Nov 30 –** Centrifuge returned and placed back into service.

December 2017

- **No process changes or issues to report for the month of December.**

17. Operator Certification

As required under section 4.2 of Approval No. 1028-03-00, the wastewater treatment facility is classified as **Class IV** and the wastewater collection system is classified as **Class III**. The facilities are classified in accordance with the *Water and Wastewater Operators' Certification Guidelines.*

As per approval section 4.2.2(b), the operation of the wastewater treatment facility shall be performed by, or under the direction of:

a) One operator who holds a valid Level IV (or higher) WWT (Wastewater Treatment) Operators Certificate of qualification; and
b) Two operators each with a valid Level III (or higher) WWT Operators Certificate, and
c) One operator with a Level II WWT (or higher) certificate, in charge of each of each shift

As per approval section 4.2.2(a), the operation of the wastewater collection system shall be performed by, or under the direction of:

a) An operator who holds a valid Level III (or higher) WWC (wastewater collection) Operators Certificate; and
b) At least one other operator who holds a valid Level II (or higher) WWC Operators Certificate

- The EPCOR operators in Okotoks are certified as shown within the table below**:**

Name	Position	Wastewater Treatment	Wastewater Collection	Cert. Number
Darren Peel	Site Manager	Level 2	Level 2	3697
Pacer Wilson	Lead Hand	Level 2	Level 3	2956
Corey Hodgson	Lead Hand	Level 1	Level 3	2529
Johnathan Bartisch	Operator	Level 4	Level 2	2944
James McElmon	Operator	Level 4	Level 2	4045
Jordan Ballard	Operator	Level 3	Level 1	3714
Terry Sapsford	Operator	Level 3	Level 2	4318
Doug Farough	Operator	Level 2	Level 2	3852
Marlon Anthony	Operator	Level 2	N/A	4944
Bryan Steed	Operator	Level 1	Level 3	2292
Patti Kjinserdahl	Operator	N/A	Level 2	2429
Prakash Kattel	Operator	N/A	Level 1	5703

Site Manager Contact Information:
Darren Peel
Site Manager – Okotoks Operation
EPCOR Water Services Inc.
200 – 1118 North Railway Street
Okotoks, AB T1S 1K1
Bus. (403) 938-1230 ext. 5
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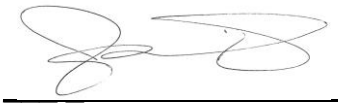
Email. dpeel@epcor.com

Supervising Operator Contact Information:
Johnathan Bartisch
Supervising Operator
EPCOR Water Services Inc.
200 – 1118 North Railway Street
Okotoks, AB T1S 1K1
Cell. (403) 899-6345
Email. jbartisch@epcor.com

18. Supervising Operator

Operator in Charge:  Johnathan Bartisch

Signature Printed

Date: February 16, 2018

Level IV Wastewater Treatment Certificate # 2944