

# TOWN OF OKOTOKS

## WASTEWATER SYSTEM

### 2018 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 1<sup>st</sup>, 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 <sub>5</sub> - TSS - VOLUME												
Parameter	Units of Measure	Frequency	Sample Type	Sampling Location		Jan	Feb	Mar	Apr	May	Jun	Jul
BOD <sub>5</sub>	mg/L	Once per day	Composite	Entering WWTP	MIN	353	328	343	226	237	244	230
					MAX	573	638	660	612	452	594	504
					AVG	438	472	428	359	339	370	367
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	280	288	260	160	152	176	152
					MAX	432	600	448	420	448	416	476
					AVG	338	352	321	283	242	286	311
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Entering WWTP	MIN	6456	6314	3923	6406	7018	6778	6562
					MAX	7297	7188	7367	9084	8174	8557	9474
					AVG	6728	6606	6724	7536	7446	7267	7077
					<b>TOTAL</b>	<b>208563</b>	<b>184957</b>	<b>208445</b>	<b>226071</b>	<b>230821</b>	<b>218007</b>	<b>219377</b>
<b>BOD5 - Biochemical Oxygen Demand</b> <b>TSS - Total Suspended Solids</b>												

Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System											
Untreated Wastewater (Raw Influent) : BOD <sub>5</sub> - TSS - VOLUME											
Parameter	Units of Measure	Frequency	Sample Type	Sampling Location		Aug	Sep	Oct	Nov	Dec	Annual
BOD <sub>5</sub>	mg/L	Once per day	Composite	Entering WWTP	MIN	286	262	300	343	314	<b>226</b>
					MAX	735	647	491	590	699	<b>735</b>
					AVG	409	420	391	436	453	<b>407</b>
TSS	mg/L	Once per day	Composite	Entering WWTP	MIN	236	252	256	268	276	<b>152</b>
					MAX	840	448	392	488	404	<b>840</b>
					AVG	347	327	320	324	326	<b>315</b>
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Entering WWTP	MIN	5896	6287	6308	6182	5986	<b>3923</b>
					MAX	6898	7379	7620	7343	7138	<b>9474</b>
					AVG	6507	6709	6734	6636	6492	<b>6872</b>
					<b>TOTAL</b>	<b>201731</b>	<b>201259</b>	<b>208769</b>	<b>199090</b>	<b>201254</b>	<b>2508344</b>
<b>BOD5 - Biochemical Oxygen Demand</b> <b>TSS - Total Suspended Solids</b>											

**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	32.2	36.8	33.8	23.6	28.0	29.2	22.3
					MAX	44.8	40.6	42.6	40.9	34.8	37.5	35.2
					AVG	36.7	38.7	38.4	33.5	31.5	32.3	31.0
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	5.85	6.20	6.35	5.65	5.65	4.85	4.50
					MAX	8.35	8.10	8.30	7.60	7.75	7.95	7.65
					AVG	7.19	7.29	7.21	6.54	6.24	6.35	6.24

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	31.6	35.5	33.3	31.7	32.5	<b>22.3</b>
					MAX	47.2	44.6	52.3	39.5	46.7	<b>52.3</b>
					AVG	35.2	39.1	37.2	35.6	36.6	<b>35.5</b>
Total Phosphorus	mg/L	Once per week	Composite	Entering WWTP	MIN	5.85	6.05	6.05	5.15	5.75	<b>4.50</b>
					MAX	12.10	8.10	8.50	8.50	8.85	<b>12.10</b>
					AVG	7.34	7.14	6.92	6.85	6.93	<b>6.85</b>



**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 <sub>5</sub> - CBOD <sub>5</sub> - TSS - VOLUME													
Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Jan	Feb	Mar	Apr	May	Jun	Jul
BOD <sub>5</sub> MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	< 2.0	< 2.0	2.7	2.2	2.1	< 2.0	< 2.0
						MAX	4.6	5.2	12.2	11.0	5.9	7.3	5.3
						AVG	2.9	3.3	5.6	5.1	3.4	4.2	3.0
CBOD <sub>5</sub> 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	4.3	2.5	12.2	3.5	3.7	3.3	2.1
						AVG	2.2	2.0	2.7	2.2	2.1	2.2	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	2.6	4.7	4.3	3.6	3.6	< 2.5
						AVG	< 2.5	2.5	3.6	2.8	2.6	2.7	< 2.5
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Prior to Release	N/A	MIN	6102	5900	2239	5998	6685	6461	6157
						MAX	6903	6861	7037	8920	7851	8169	9669
						AVG	6345	6285	6328	7252	7116	6922	6753
						TOTAL	196709	175973	196172	217563	220592	207666	209347
BOD <sub>5</sub> - Biochemical Oxygen Demand						< BOD <sub>5</sub> /CBOD <sub>5</sub> Estimate : Difference between DO1 & DO5 < 2 mg/L							
CBOD <sub>5</sub> - Carbonaceous Biochemical Oxygen Demand						< TSS Estimate : Less than 2.5 mg was retained on the filter							
TSS - Total Suspended Solids													

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Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System												
Treated Wastewater: BOD <sub>5</sub> - CBOD <sub>5</sub> - TSS - VOLUME												
Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
BOD <sub>5</sub> MDL : 2 mg/L	mg/L	Once per day	Composite	Prior to Release	N/A	MIN	< 2.0	< 2.0	2.0	2.0	2.4	< 2.0
						MAX	5.0	4.6	10.1	5.3	7.5	12.2
						AVG	2.5	3.3	3.5	3.4	4.8	3.8
CBOD <sub>5</sub> 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	2.3	< 2.0	4.0	2.2	3.4	12.2
						AVG	2.0	< 2.0	2.1	2.0	2.4	2.2
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	2.9	3.0	< 2.5	3.9	4.7
						AVG	< 2.5	2.5	2.5	< 2.5	2.8	2.7
VOLUME	m <sup>3</sup> /day	Once per day	Continuous	Prior to Release	N/A	MIN	5577	5757	5595	5500	5238	2239
						MAX	6917	6733	6738	6536	6408	9669
						AVG	6193	6118	6054	5899	6021	6441
						TOTAL	191991	183540	187676	176965	186641	2350835
BOD <sub>5</sub> - Biochemical Oxygen Demand						< BOD <sub>5</sub> /CBOD <sub>5</sub> Estimate : Difference between DO1 & DO5 < 2 mg/L						
CBOD <sub>5</sub> - Carbonaceous Biochemical Oxygen Demand						< TSS Estimate : Less than 2.5 mg was retained on the filter						
TSS - Total Suspended Solids												

**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	MIN	< 0.50	< 0.50	1.48	0.61	< 0.50	< 0.50	< 0.50
						MAX	1.26	6.20	6.51	4.48	1.17	< 0.50	< 0.50
					AVG	0.54	2.13	3.77	1.99	0.52	< 0.50	< 0.50	
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.04	0.10	0.20	0.11	0.09	0.08	0.05
						MAX	0.19	0.22	0.37	0.23	0.22	0.27	0.18
						AVG	0.14	0.17	0.28	0.18	0.17	0.19	0.12
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 2018 are reported as > 100 (Not Acutely Lethal).													

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	MIN	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
						MAX	< 0.50	< 0.50	1.52	2.09	1.65	6.51	
					Jul 1 - Sep 30 ≤ 5mg/L	AVG	< 0.50	< 0.50	0.55	0.58	0.68	1.06	
Total Phosphorus MDL : 0.02 mg/L	mg/L	Once per day	Composite	Prior to Release	≤ 0.5 mg/L	MIN	0.10	0.07	0.15	0.02	0.07	0.02	0.02
						MAX	0.75	0.23	1.95	0.29	0.31	1.95	
						AVG	0.21	0.17	0.26	0.16	0.21	0.19	
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 2018 are reported as > 100 (Not Acutely Lethal).													

**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 <sub>2</sub> NO <sub>3</sub> - 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	1.10	2.41	4.38	2.07	0.70	1.39	< 0.07
						MAX	1.69	6.60	6.50	4.46	2.18	1.52	1.89
						AVG	1.38	4.04	5.34	3.11	1.32	1.46	1.15
NO <sub>2</sub> - NO <sub>3</sub> MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	5.12	5.02	4.45	4.53	4.64	5.13	5.27
						MAX	5.65	5.49	5.10	5.10	5.27	5.38	5.65
						AVG	5.39	5.27	4.83	4.84	5.01	5.28	5.53
TN MDL : 0.01 mg/L	mg/L	Once per week	N/A (calculated)	Prior to Release	≤ 15mg/L	MIN	6.31	7.86	8.83	7.17	5.34	6.52	5.63
						MAX	7.10	11.62	11.22	9.30	7.24	6.90	7.51
						AVG	6.77	9.30	10.17	7.95	6.33	6.74	6.41
TKN - Total Kjeldahl Nitrogen NO <sub>2</sub> - NO <sub>3</sub> - 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 <sub>2</sub> NO <sub>3</sub> - 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	1.12	1.09	0.69	1.30	1.30	< <b>0.07</b>
						MAX	7.38	1.75	8.94	3.60	7.60	<b>8.94</b>
						AVG	2.93	1.45	2.64	2.05	3.33	<b>2.52</b>
NO <sub>2</sub> - NO <sub>3</sub> MDL : 0.01 mg/L	mg/L	Once per week	Composite	Prior to Release	N/A	MIN	5.60	6.05	6.49	5.84	5.63	<b>4.45</b>
						MAX	6.03	6.73	7.31	13.30	12.90	<b>13.30</b>
						AVG	5.83	6.45	6.91	9.54	9.55	<b>6.20</b>
TN MDL : 0.01 mg/L	mg/L	Once per week	N/A (calculated)	Prior to Release	≤ 15mg/L	MIN	6.99	7.65	7.24	7.50	8.05	<b>5.34</b>
						MAX	13.38	8.44	15.92	16.50	20.20	<b>20.20</b>
						AVG	8.76	7.89	9.53	11.58	12.88	<b>8.68</b>
TKN - Total Kjeldahl Nitrogen NO <sub>2</sub> - NO <sub>3</sub> - 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	20	20	< 10	10	10	20	< 10
						Geometric Mean	11	12	< 10	10	10	12	< 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	20	10	< 10	10	< 10	< 10	< 10
						Geometric Mean	11	10	< 10	10	< 10	< 10	< 10
NOTE: 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.													

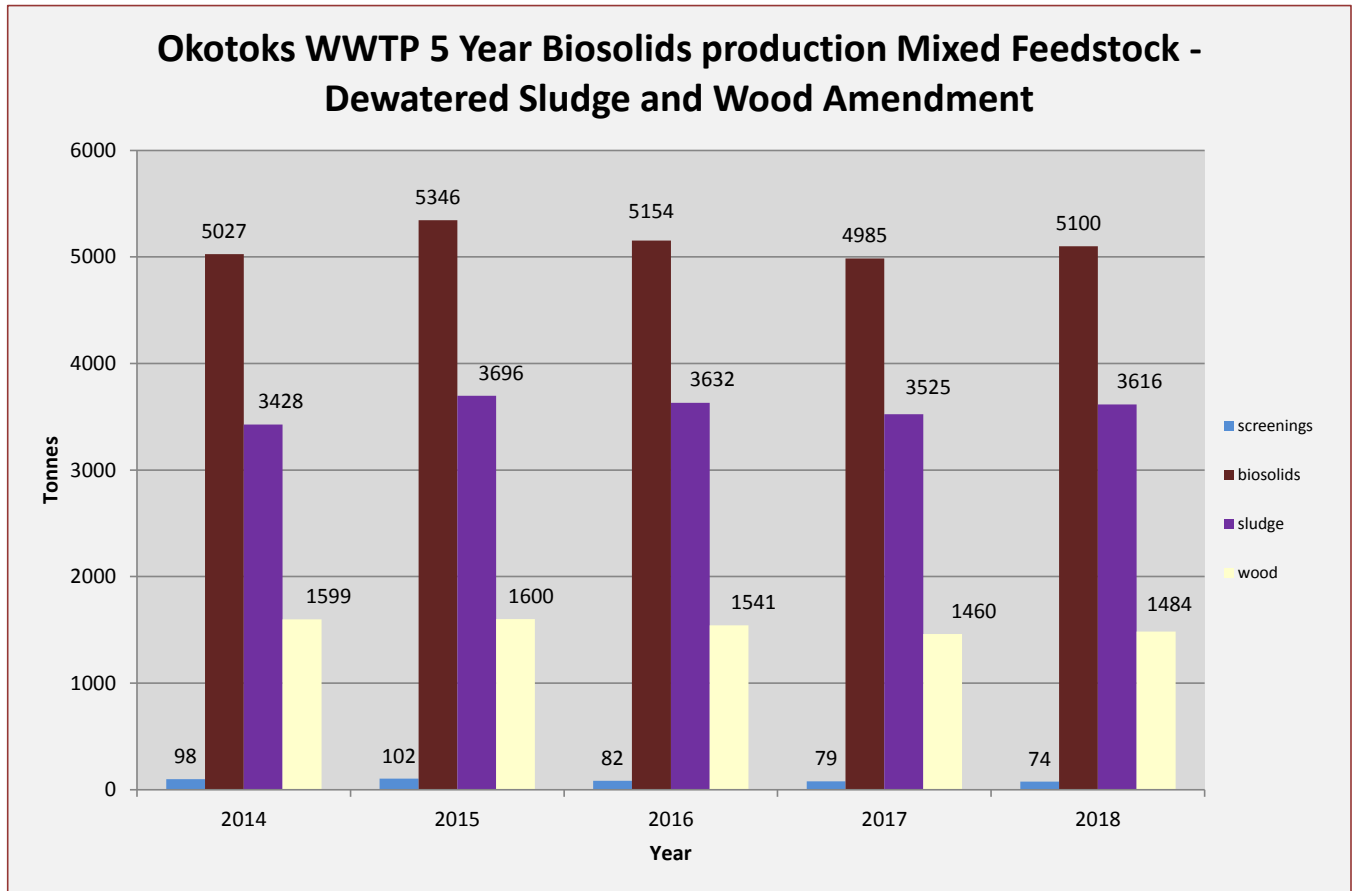
Approval # 1028-03-00; Table 6-1: Monitoring - Town of Okotoks Wastewater System												
Treated Wastewater: TOTAL & FAECAL COLIFORMS												
Parameter	Units of Measure	Frequency	Sample Type	Sampling Location	Approval Limit		Aug	Sep	Oct	Nov	Dec	Annual
Total Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 1000 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	<b>10</b>
						MAX	< 10	< 10	20	10	600	<b>600</b>
						Geometric Mean	< 10	< 10	13	10	59	<b>15</b>
Faecal Coliform	Count per 100 mL	Once per week	Grab	Prior to Release	≤ 200 per 100 mL	MIN	< 10	< 10	< 10	< 10	< 10	<b>10</b>
						MAX	< 10	< 10	20	< 10	173	<b>173</b>
						Geometric Mean	< 10	< 10	11	< 10	36	<b>12</b>
<p>NOTE: 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.</p>												



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

<b>EPCOR Water Services - Okotoks Wastewater Treatment Plant 2018 Annual Partially Composted Sludge Production MIN/MAX/AVG</b>											
	<b>COMPOST FEEDSTOCK</b>						<b>SOLIDS SHIPPED FROM WWTP</b>				<b>General Notes</b>
	<b>Dewatered Sludge TOTAL</b>	<b>Dewatered Sludge MIN</b>	<b>Dewatered Sludge MAX</b>	<b>Wood Shavings Total</b>	<b>Wood Shavings MIN</b>	<b>Wood Shavings MAX</b>	<b>Mixed Feedstock to Regional Facility TOTAL</b>	<b>Mixed Feedstock to Regional Facility - MIN</b>	<b>Mixed Feedstock to Regional Facility - MAX</b>	<b>Raw Screenings to Regional Landfill TOTAL</b>	
<b>Month</b>	<b>Metric Tonnes/Month</b>						<b>Metric Tonnes/Month</b>				
<b>JAN</b>	328.8	7.1	15.7	139.8	3.4	6.3	468.6	10.5	21.9	7.5	1) Raw Screenings/Grit hauled to landfill: kept separate from Biosolids Compost.  2) All raw feedstock (dewatered sludge & sawdust) sent to approved regional compost facility - EcoAg.  3) Wood amendment supplied by Spray Lakes Sawmills.  <i>WAS: Waste Activated Sludge</i>
<b>FEB</b>	281.6	7.6	13.4	117.7	3.4	5.4	399.3	11.1	18.7	5.7	
<b>MAR</b>	280.0	0.0	14.2	117.5	0.0	5.6	397.4	0.0	19.7	6.2	
<b>APR</b>	368.8	7.7	21.0	164.8	3.4	9.2	533.7	11.1	30.2	8.2	
<b>MAY</b>	324.9	7.3	15.7	136.1	3.4	6.8	461.0	10.8	22.5	7.5	
<b>JUN</b>	314.8	7.9	13.5	134.9	3.2	5.5	449.6	11.1	18.9	6.7	
<b>JUL</b>	279.7	6.2	12.3	107.7	0.3	5.4	387.3	8.8	17.6	4.9	
<b>AUG</b>	274.9	6.7	15.0	104.0	2.7	5.4	378.9	9.6	20.4	3.7	
<b>SEP</b>	253.2	5.8	11.7	100.9	1.9	4.7	354.1	8.0	16.2	5.2	
<b>OCT</b>	288.5	4.3	14.6	110.1	1.6	6.2	398.6	5.9	20.7	7.9	
<b>NOV</b>	311.2	8.2	13.3	125.3	3.1	5.3	436.5	11.4	18.4	5.6	
<b>DEC</b>	309.6	8.0	16.0	125.7	3.1	6.4	435.2	11.1	22.4	4.9	
<b>TOTAL</b>	<b>3615.9</b>			<b>1484.4</b>			<b>5100.3</b>			<b>74.1</b>	
<b>AVG</b>	<b>301.3</b>			<b>123.7</b>			<b>425.0</b>			<b>6.2</b>	
<b>MIN</b>	<b>253.2</b>			<b>100.9</b>			<b>354.1</b>			<b>3.7</b>	
<b>MAX</b>	<b>3615.9</b>			<b>164.8</b>			<b>533.7</b>			<b>8.2</b>	

## 10. Chart – WWTP: Five Year Biosolids Production



## 11. Summary of Incidents Reported to AEP – 2018

**Nov 26** – Operator was called into the WWTP at 5:45pm to find that the UV slide gate that controls the height of the Effluent in the UV channel had failed in the open position causing the UV lights to shut off due to the bulbs getting exposed. The system was off for three hours which is a contravention of the approval to operate forcing a call to AEP and reporting the issue. **AEP REFERENCE # 347024**

**July 10** – During a quality assurance review of the annual report (February, 2019), it was identified that the TKN result from July 10<sup>th</sup> was deemed to be invalid and should be reported to AEP as an invalid sample due to likely sample contamination. **AEP REFERENCE # 349678**

## 12. Summary of Treated Wastewater used for Irrigation – 2018

There was no treated wastewater used for irrigation purposes in 2018.

**13. WWTP Uncommitted Hydraulic Reserve Capacity – 2018-2022**

**WWTP Uncommitted Hydraulic Reserve Capacity**

<b>Municipality</b>	Town of Okotoks	<b>Facility</b>	Okotoks Wastewater Treatment Plant
<b>Supervising Operator</b>	James McElmon	<b>Phone No.</b>	(403) 899-6343
<b>Treatment Type</b>	Mechanical – Tertiary BNR	<b>Design Capacity (m3/d)</b>	10,000

	<b>Year</b>	<b>2018</b>	<b>*2019</b>	<b>*2020</b>	<b>*2021</b>	<b>*2022</b>
<b>Average Daily Flow - 2018</b>	m3/d	6,872	6,720	6,915	7,109	7,304
<b>Average Daily Flow Per Capita (F)</b>	m3/capita/d	0.237	0.225	0.225	0.225	0.225
<b>Hydraulic Reserve Capacity (Cr)</b>	m3/d	3,128	3,280	3,085	2,891	2,696
<b>Number of Unconnected Approved Lots (L)</b>	lots	419	400	400	400	400
<b>Connected Population (P)</b>	persons	29,002	29,867	30,732	31,597	32,462
<b>Number of Residential Connections (H)</b>	connections	9,075	11,062	11,382	11,703	12,023
<b>Committed Reserve (Com)</b>	m3/d	317	243	243	243	243
<b>Uncommitted Reserve Capacity (Cu)</b>	m3/d	2,811	3,037	2,842	2,648	2,453

Cr = Design Capacity – Average Daily Flow Cu = Cr – [L*F*P/H] 2018 connected Population is based on Federal census data	*Years 2019-2022 are estimates only Future Pop is based on 5 yr annual ual avg growth rate of 865 Future Unconnected Approved Lots based on 5 yr avg Future Res Connections is based on 2.7 people per connection
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## 14. Summary of Chemicals Used - 2018

<b>Summary of Chemicals Used in 2018</b>				
<b>MONTH</b>	<b>Zetag 8190 Dry Polymer kg</b>	<b>ALUM kg</b>	<b>Sodium Hypochlorite 16% L</b>	<b>Sodium Sulfite - Dechlorination tablets Kg</b>
Jan	536	0	0	0
Feb	425	0	0	0
Mar	446	0	20	1
Apr	560	0	20	1
May	543	0	0	0
Jun	612	0	20	1
Jul	540	0	0	0
Aug	472	0	0	0
Sep	449	0	0	0
Oct	484	0	60	3
Nov	511	0	0	0
Dec	521	0	0	0
<b>TOTAL</b>	<b>6098</b>	<b>0</b>	<b>120</b>	<b>6</b>
1 Dry Polymer used in Sludge Dewatering process 2 Sodium Hypochlorite used for cleaning Disk Filtration process ( <u>Not for Treatment</u> ) 3 Sodium Sulfite used for dechlorination after disk filter cleaning 4 Alum used for Chemical Phosphorus removal ( <b>No Alum was used in 2018</b> )				

## 15. Summary of WSER Testing – 2018

WSER Monitoring Requirements 2018 - Town of Okotoks WWTP						
Parameter						
Sample Type	24 Hour Composite					Grab
Parameter	CBOD		TSS		Total Ammonia	Acute Lethality
Environment Canada Limits Date	^ Q v	< 25 mg/L	^ Q v	< 25 mg/L	^ Q v	<50%
9-Jan-18	<	4		2		0.07
23-Jan-18	<	4	<	1		0.11
6-Feb-18	<	4		2		0.58
20-Feb-18	<	4	<	2		3.44
6-Mar-18	<	4		4		4.60
20-Mar-18	<	4		3		3.62
<b>Q1 AVG</b>	<	<b>4</b>		<b>2</b>		<b>2.07</b>
<b>Q1 MIN</b>	<	<b>4</b>	<	<b>1</b>		<b>0.07</b>
<b>Q1 MAX</b>	<	<b>4</b>		<b>4</b>		<b>4.60</b>
3-Apr-18	<	4		5		1.70
17-Apr-18	<	4		3		2.42
1-May-18	<	4	<	1		0.68
15-May-18	<	4		13		0.09
29-May-18	<	4	<	2		0.03
12-Jun-18	<	4		3		0.05
26-Jun-18	<	4		7		0.10
<b>Q2 AVG</b>	<	<b>4</b>		<b>5</b>		<b>0.72</b>
<b>Q2 MIN</b>	<	<b>4</b>	<	<b>1</b>		<b>0.03</b>
<b>Q2 MAX</b>	<	<b>4</b>		<b>13</b>		<b>2.42</b>
10-Jul-18	<	4	<	2		0.04
24-Jul-18	<	4	<	2		0.11
7-Aug-18	<	4	<	2		0.04
21-Aug-18	<	4	<	2		0.05
4-Sep-18	<	4	<	2		0.05
18-Sep-18	<	4		4		0.04
<b>Q3 AVG</b>	<	<b>4</b>		<b>2</b>		<b>0.05</b>
<b>Q3 MIN</b>	<	<b>4</b>	<	<b>2</b>		<b>0.04</b>
<b>Q3 MAX</b>	<	<b>4</b>		<b>4</b>		<b>0.11</b>
2-Oct-18	<	4		35		0.03
16-Oct-18	<	4	<	2		0.07
30-Oct-18	<	4	<	2		0.09
13-Nov-18	<	4	<	2		0.10
27-Nov-18	<	4	<	2		0.10
11-Dec-18	<	4		2		0.41
25-Dec-18	<	4	<	2		1.33
<b>Q4 AVG</b>	<	<b>4</b>		<b>7</b>		<b>0.30</b>
<b>Q4 MIN</b>	<	<b>4</b>	<	<b>2</b>		<b>0.03</b>
<b>Q4 MAX</b>	<	<b>4</b>		<b>35</b>		<b>1.33</b>
<b>Annual AVG</b>	<	<b>4</b>		<b>4</b>		<b>0.79</b>
<b>Annual MIN</b>	<	<b>4</b>	<	<b>1</b>		<b>0.03</b>
<b>Annual MAX</b>	<	<b>4</b>		<b>35</b>		<b>4.60</b>

## 16. Summary of Operational Highlights & Problems

### January 2018

- **Jan 3** – Southern Alberta maintenance (SAM) replaced the backwash pump on Disc Filter #3 due to a motor failure.
- **Jan 4** – Operations was able to get the Odour Control system thawed out and placed back into service due to the below average cold external temperatures we are experiencing.
- **Jan 9** – New rotor and stator was installed on sludge feed pump #1. (Centrifuge)
- **Jan 12** – During daily WWTP inspections it was found that the Grit Vortex discharge piping had froze solid and needed High Country Vac services to come onsite and steam the line to free blockage.

### February 2018

- **Feb. 13** – Operations called in afterhours due to a DAF unit communication failure that had to be reset and placed back into service.
- **Feb. 21** – Operations increased the WAS rate from 300 to 320 L/min due to a increase of the Secondary sludge blanket 5ft.
- **Feb. 28** – Operations called in afterhours due to a Influent sampler fault that was found to be a blockage on the suction line that had to be removed.

### March 2018

- **Mar. 1** – Operations increased wasting from Primary Clarifier to 34 m<sup>3</sup> due to a 6 foot sludge blanket.
- **Mar. 17** – Operations was forced to shut down Screw pump #3 due to the bottom bearing failing.
- **Mar. 23** – Screw pump #1 had to be shut down due to a internal mechanical failure with the top weld.
- **Mar. 23** – Centrifuge went down on a programing issue forcing operations to transfer the contents of the Twas tank to the emergency holding cell until repairs were complete.
- **Mar. 28** – Operations with the help of SAM (Southern Alberta Maintenance) fixed the issue with the Centrifuge and returned it back into operation.
- **Mar. 30** – Operations increased WAS rate from 220 L/min to 250 L/min due to a increase in MLSS in aerobic zone #3.
- **Mar. 31** – The DAF unit was offline for 4 hours today while operators and (SAM) worked to repair a broken top drive chain that controls the top skimmer blades.

### April 2018

- **April 5** – Screw pump #1 placed back into service after some major welding repairs were needed to repair stress fractures on the top half of screw pump.
- **April 17** – Northern underwater services (divers) onsite to do a scheduled inspection of the Secondary rake mechanism to determine if there was any further damage taking place, no further damage was found at this time.
- **April 30** – Operations cleaned off all three Bioreactor DO probes due to values out of range from a manual test done of the DO levels.

**May 2018**

- **May 3** – Operations installed a new motor and gearbox on the shaft less screw auger that's located in the solids handling building.
- **May 15** – High Country Vac services onsite to clean and remove the contents of the grease pit attached to the Primary Clarifier and haul it to Calgary for disposal.
- **May 15** – On call operator called after hours due to Air Blower #2 faulting out on high temperatures.
- **May 17** – RAS rate increased from 130 L/sec to 150 L/sec due to a high Secondary sludge blanket.
- **May 23** – Operations performed a routine cleaning and inspection of all three DO sensors in the Bioreactor.
- **May 28** – Screw Pump #2 was placed out of service due to the top bearing assembly failing.

**June 2018**

- **June 1** – Increased WAS rate from 280 L/min to 300 L/min due to high MLSS in the Bioreactor.
- **June 4** – Balzers contracting onsite to remove Screw Pump #2 and replace bottom bearing.
- **June 6** – DAF unit was shut down for the 5 year annual inspection of the pressure tank and placed back into service after passing its inspection.
- **June 20** – Placed Channel Monster out of service and removed from Influent channel due to right side cutter stack bearing failure and sent out to be repaired.
- **June 21** – Balzers contracting back onsite to install new bottom bearing on Screw Pump #3 and place back into to service.
- **June 27** – Disc Filter #3 was taken off-line for a 48 hour cleaning after inspection of the filters.
- **June 29** – Dechlorinated Disc Filter #3 and placed back into service.

**July 2018**

- **July 2** – WAS pump #1 faulted out and it was determined that the VFD was to blame for the issue, operations switched pump #1 over to WAS pump #2 VFD drive and placed into service.
- **July 3** – Operations removed blockage from Primary pump #1 and returned back into service.
- **July 10** – Weekly TKN sample deemed to be 'invalid' due to likely sample contamination. Reported to AEP following QA review of the annual report. **AEP REFERENCE # 349678**
- **July 16** – High Country Vac services on site to deal with a blockage in the Primary waste line.

**August 2018**

- **Aug 17** – Decreased primary clarifier wasting from 40m<sup>3</sup> to 36m<sup>3</sup> to increase sludge blanket for VFA production.
- **Aug 17** – Decreased wasting (WAS) from the bioreactor to increase SVI in the mixed liquor.
- **Aug 17** – Replaced all air filters on the blowers.
- **Aug 27** – Lowered primary wasting from 40m<sup>3</sup> to 37m<sup>3</sup> to increase primary blanket for VFA production.
- **Aug 29** – Removed mixer #3 from bioreactor due to failure and replaced with shelf spare.

**September 2018**

- **Sept 5** – Operations lowered primary wasting down from 37 m<sup>3</sup> to 35 m<sup>3</sup> due to a two foot sludge blanket in the secondary clarifier.
- **Sept 23** – Operations turned on air blower #4 in the afternoon due to low DO's in the bioreactor because of high Influent flows coming into the plant.

**October 2018**

- **Oct 9** – Lowered wasting rate from 275 L/min to 200 L/min from the Secondary to the DAF unit due to overloading issues with the DAF unit.
- **Oct 13** – Placed Disc Filter #2 off-line for cleaning due to the filter not being able to maintain weekend flow rates (by-passing).
- **Oct 15** – Took DAF unit off-line for 2 hours to do a complete drain down of tank and a flush of the saturation tank due to the DAF unit continually failing.
- **Oct 17** – Operations placed Disc Filter #2 back on-line after performing a 48 hour cleaning.
- **Oct 22** – Endress+Hauser with the help of (SAM) performed the annual Influent and Effluent mag meter calibrations.
- **Oct 23** – Canadian Underwater (divers) on-site today to perform the quarterly inspection of the Secondary rake mechanism and was found to be no change from previous dive.
- **Oct 23** – Operations placed Disc Filter #3 back on-line after performing a 24 hour cleaning.
- **Oct 24** – High Country Vac services and O'Leary construction on-site to repair a air leak from air blower #4 discharge line.
- **Oct 30** – SAM (southern Alberta maintenance) started the process of changing the air blower set points and daily DO requirements for the Bioreactor in efforts to lower air supply amount.

**November 2018**

- **Nov 19** – Operations unable to run denitrification pump for the bioreactor due to a pump and VFD failure. Operations were forced to transfer MLSS via 6 inch diesel pump overland to help with the denitrification process until the pump can be repaired.
- **Nov 26** – Operator was called into the WWTP at 5:45pm to find that the UV slide gate that controls the height of the Effluent in the UV channel had failed in the open position causing the UV lights to shut off due to the bulbs getting exposed. The system was off for three hours which is a contravention of the approval to operate forcing a call to AEP and reporting the issue. **AEP REFERENCE # 347024**
- **Nov 28** – Operations increased RAS rate to 100% from 90% to assist with denitrification due to main pump not working.

**December 2018**

- **Dec 2** – Decreased wasting from the bioreactor from 300 L/min to 275 L/min due to a sudden drop in MLSS test results.
- **Dec 11** – Operations took Flow EQ tank offline for a couple of days to determine if the return flow was affecting the Influent flow meter daily totals. After a few days offline it was found that the EQ flow was giving us a false read for Influent flow totals forcing the SCADA team to reprogram the daily totals to be more representative of the actual flows.
- **Dec 18** – The repaired Denitrification pump was installed and placed back into service.
- **Dec 22** – Suntech electrical onsite to perform final programming and testing on new Denitrification pump VFD.
- **Dec 27** – High Country Vac services onsite to clean out Primary grease line and pit due to issues with the system plugging off.



## 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
Davey Robertson	Site Manager	Level 4	Level 2	2350
Pacer Wilson	Lead Hand	Level 2	Level 3	2956
Corey Hodgson	Lead Hand	Level 1	Level 3	2529
James McElmon	Lead Hand	Level 4	Level 2	4045
Johnathan Bartisch	Operator	Level 4	Level 2	2944
Jordan Ballard	Operator	Level 3	Level 1	3714
Terry Sapsford	Operator	Level 3	Level 2	4318
Doug Farough	Operator	Level 2	Level 3	3852
Marlon Anthony	Operator	Level 2	Level 1	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:

Davey Robertson  
 Site Manager – Okotoks Operations  
 EPCOR Utilities Inc.  
 200 – 1118 North Railway Street  
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Supervising Operator Contact Information:

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 Lead Hand – Okotoks WWT Operations  
 EPCOR Utilities Inc.  
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 Cell: (403) 899-9343  
 Email: [jmcelmon@epcor.com](mailto:jmcelmon@epcor.com)

**18. Supervising Operator**

	<p><b>James McElmon</b></p>	<p><b>4045</b></p>
<p>Signature</p>	<p>Printed</p>	<p>Certificate #</p>