

COCHRANE
WATER / WASTE WATER SERVICES

WASTE WATER TREATMENT
PLANT

2016 ANNUAL REPORT

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2016 Annual Report

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ANNUAL
PERFORMANCE
REPORT

Annual Performance Report

This report is prepared to comply with Amended Environmental Compliance Approval Number 2712-A8ANWT issued May 13, 2016. The report shall contain:

- (a) A summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the works during the 2016 reporting period;

FLOWS	
Total Flow	<i>633,883 cubic meters</i>
Average Daily Flow	<i>1,731 cubic meters</i>
Peak Hydraulic Flow	<i>9,241 cubic meters</i>

RAW SEWAGE RESULTS

RAW SEWAGE	MONTHLY AVERAGE RESULTS
BOD ₍₅₎	148.58 mg/l
TOTAL SUSPENDED SOLIDS	146.25 mg/l
TOTAL PHOSPHORUS	3.37 mg/l
TKN (as N)	29.43 mg/l
AMMONIA & AMMONIA NITROGEN	18.60 mg/l
pH	N/A

FINAL EFFLUENT RESULTS

FINAL EFFLUENT	MONTHLY AVERAGE RESULTS
BOD ₍₅₎	13.66 mg/l
TOTAL SUSPENDED SOLIDS	8.82 mg/l
TOTAL PHOSPHORUS	0.40 mg/l
TKN (as N)	3.96 mg/l
AMMONIA	0.77 mg/l
CHLORINE RESIDUAL	0.04 mg/l
NITRITE	0.11 mg/l
NITRATE	12.39 mg/l
CBOD ₍₅₎	5.91 mg/l
FECAL COLIFORM ¹	101,916.67 CFU/100ml
FECAL STREPTOCOCCUS ²	12,566.67 CFU/100ml
E.COLI	188,943.33 CFU/100ml
WAS pH MAINTAINED BETWEEN 6.0-9.5 @ ALL TIMES?	NO

¹ Tested January to June

² Tested January to June

The total flow in 2016 was 633,883 cubic meters which represents a 4.26 % increase from 2015. The total flow in 2016 was 31 % of the average day flow design capacity.

The following represents removal efficiencies for the year 2016.

BOD ₅)	85.66%
TOTAL SUSPENDED SOLIDS	91.86%
TOTAL PHOSPHORUS	86.49%
TKN (as N)	83.11%
AMMONIA	95.85%
AVERAGE REMOVAL EFFICIENCY	88.59 %

The above represents an increase in overall operating efficiency of 3.40% over the year 2015.

- (b) A description of any operating problems encountered and corrective actions taken;
- 1. Return Sludge Pump Failure – replaced with a new pump.*
 - 2. Changed flights in west clarifier*
- (c) A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works;
- 1. Drained and Cleaned both side of the Aeration Zone*
 - 2. Upgraded blower*
 - 3. Changed diffusers in aeration zone to fine air*
 - 4. Installed Variable Frequency Drive on the sludge return pumps*
 - 5. Replaced sludge return pump*
 - 6. Changed flights in west clarifier*

Other maintenance involved routine oiling, greasing, cleaning, servicing etc.

- (d) A summary of any effluent quality assurance or control measures undertaken in the 2016 reporting period;

The monitoring program consists of regular daily rounds ensuring all equipment is functioning and that daily temperature, pH levels, chlorine residuals, dissolved oxygen, and weekly Phosphorus and Ammonia tests are recorded, and controlled. Sludge Blanket levels are also monitored and controlled on a daily basis along with scum removal. Monthly samples are taken for BOD, Suspended Solids, TKN, Nitrite, Nitrate, Acute Lethality, Fecal Coliforms, and Fecal Streptococcus.

- (e) A summary of the calibration and maintenance carried out on all effluent monitoring equipment;

Attached to this report is the calibration record for the instrumentation at the Waste Water Treatment Plant. The Flow Recorder / Indicator / Totalizer, and the Milltronic Outflow Level Indicator were calibrated on November 5th, 2016 a by Chris Maynard of Accel Electric of Cochrane, Ontario and confirm that the instruments are operating within plus/minus 15% of the actual flow rate. In 2017 the instruments will once again be checked for their accuracy.

- (f) A description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6;

The attached Data Summary shows the Cochrane Waste Water Treatment Plant has not exceeded the effluent concentrations for the Biochemical Oxygen Demand (20 mg/l), the Total Suspended Solids (20 mg/L) and Phosphorus Criteria (1.0 mg/l), as specified in Condition 7 of the aforementioned certificate of approval. However, we did exceed E-Coli. We are currently exploring new disinfection methods to rectify this problem. pH Levels were maintained except for the Ferric Spill event.

Compliance - (Certificate of Approval) The peak hydraulic flow capacity of 11,500 cu. Meters / day was not exceeded during the year 2016.

- (g) A tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the 2017 reporting period and a summary of the locations to where the sludge was disposed;
(sludge will be hauled on an “as needed” basis)

It is anticipated that sludge volume haulage for the year 2017 should be equal to or less than that of 2016 as the Plant is operating at or close to its maximum efficiency.

SLUDGE VOLUME HAULED

YEAR	SLUDGE AMOUNT HAULED
2012	3437 M3
2013	2829 M3
2014	3189 M3
2015	3373 M3
2016	3050 M3

The Town of Cochrane retains Dufour Waste Disposal Inc. of Kapuskasing, Ontario (M.O.E. Authorization #A 920419) to haul and handle the sludge from the Water Pollution Control Plant. Dufour Waste Disposal Inc. advises that the sludge is dumped at the Landfill Dumpsite in Moonbeam Ontario and not used for any other purpose.

- (h) A summary of any complaints received during the 2016 reporting period and any steps taken to address the complaints;

**Received odor complaints during upgrades to the aeration system
Received odor complaint for an overflowing manhole #208 on September 8, 2016.**

- (i) A summary of all Bypass, spill or abnormal discharge events;

The bypass alarm signaled six partial bypasses (overflows) for the year 2016. There were 3 events classified as spills for the year 2016

DATE	TYPE	DURATION (hours)	FLOW (m3)
May 15, 2016	Spill	Unknown	23.5 (Ferric Sulfate)
May 28, 2016	Bypass	5	2,591
May 29, 2016	Bypass	14.5	1,601.2
August 19, 2016	Bypass	1.75	50
August 20, 2016	Bypass	22.75	2,503
September 8, 2016	Spill	1.25 (Discovered)	Unknown
September 10, 2016	Bypass	25.5	935.5
October 18, 2016	Bypass	4.75	218
December 5, 2016	Spill		

The Bypass events were triggered by spring runoff and heavy rains. All bypass /overflow events have been tested for all specified parameters, as per attached Bypass Summary.

The log date, time and duration of any bypasses (overflow) or upset condition will be recorded and sampled for BOD, suspended Solids and Total Phosphorus. Further, the Spills Action Centre (SAC) will be notified, with the completed form sent to the MOE District Office, which is a requirement.

- (j) A copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule 'A', Section 1, with a status report on the implementation of each modification;

Modifications made are listed in Amended Environmental Compliance Approval Number 2712-A8ANWT.

- (k) A report summarizing all modifications completed as a result of Schedule 'A', Section 3;

Modifications made are listed in Amended Environmental Compliance Approval Number 2712-A8ANWT.

- (l) Any other information the Water Supervisor requires from time to time

None

This is the report on the Cochrane Waste Water Treatment Plant for the year 2016. I certify that the information in this document and all the attachments are correct, accurate and complete to the best of my knowledge.

Prepared by,
Jared Alcock
Interim Asset Coordinator

Respectfully submitted and reviewed by:

Lynn Chapleau
Compliance Supervisor

ANNUAL SUMMARY

ANNUAL SUMMARY 2016

Municipality: **Cochrane (PUC)**
 Project Name: **Cochrane Water Pollution Control Plant**
 Project Number: **120000355**
 Project Location: **Cochrane, ON**

Month	Parameter	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL	AVERAGE	MAXIMUM	MINIMUM
	Total Flow	23437	17564	42525	70634	66386	77921	55020	66341	62568	61247	53624	36616	633883	52823.583	77921	17564
Influent	Peak Rate	1458	1307	3722	7784	9241	4837	2562	7701	5298	4561	2365	2384	53220	4435.00	9241	1307
Bypass	Plant-Vol.					4192.2			2552.8	935.53	218			7898.53	1974.63	4192.2	218
	Time - Hrs					19.5			24.5	26.75	4.75			75.5	18.88	26.75	4.75
Raw	Susp. solids	232	178	86	75	130	79	220	162	83	205	160	145	1755	146.25	232	75
	BOD	200	289	101	65	130	69	89	190	140	90	170	250	1783	148.58	289	65
	TKN	33.4	57.8	22	23.2	29	11.3	23.8	44.5	24.2	26.2	34	23.8	353.2	29.43	57.8	11.3
	Phosphorus	5.27	6.07	2.11	2.5	3.87	1.15	2.82	4.24	2.27	2.76	3.98	3.44	40.48	3.37	6.07	1.15
	Ammonia	22.8	30	13.6	20.7	16.8	6.77	17.5	23.9	16.8	20.8	18.7	14.8	223.17	18.60	30	6.77
Effluent	Susp. solids	8	8	33	11.5	15.3	8.5	6.5	4	3	4	4	0	105.8	8.82	33	0
	BOD	15.4	4.6	51	34	6.6	23	4.4	5.9	4.2	5	5.6	4.2	163.9	13.66	51	4.2
	Phosphorus	1.108	0.2521667	0.3416	0.5178333	0.42	0.6888571	0.2630667	0.290645	0.186643	0.24149	0.3196682	0.166495	4.7977591	0.40	1.108	0.166495
	Ammonia	4.94	0.295	0.638	1.4766667	0.1864	0.5542857	0.1836471	0.3538421	0.1205	0.1139	0.2365238	0.1498421	9.2486075	0.77	4.94	0.1139
	Nitrate	9.37	14.6	9.55	0.28	12.7	5.08	12.9	17.4	18.3	20.2	12.6	15.7	148.68	12.39	20.2	0.28
	Nitrite	0.13	0.27	0.45	0.036	0.07	0.11	0.03	0.06	0.03	0.03	0.03	0.03	1.276	0.11	0.45	0.03
	TKN	6.91	4.28	8.06	6.59	2.5	6.2	2.9	1	1	2.3	4.22	1.5	47.46	3.96	8.06	1
	CBOD	4.9	4.6	18.3	9	6	8.7	2	4.6	2.5	2.5	5.6	2.2	70.9	5.91	40000	9100
	Fecal Coliform	9100	400000	24400	129000	30000	19000							611500	101916.67	1427950	9100
	Fecal Streptococcus	5400	3400	32200	28000	3400	3000							75400	12566.67	32200	3000
	E.Coli	>30000	47000	120000	145000	98466.667	1427950	33550	15560	23200	40750	43400	83500	2078376.7	188943.33	1427950	15560
	Acute Lethality	Pass	Pass	Pass	Pass	Pass			Pass			Pass					
Date	Air Used																
	Aeration Temp.	8.01111	9.0941176	9.22	10.976471	12.14375	13.969474	15.589474	16.68	16.33158	14.036842	12.266667	9.8333333	148.15282	12.35	16.68	8.01111
	30 Min. S.S.	31.16667	43.625	38.55556	32.411765	35.235294	23.888889	58.842105	18.95	32.05263	37.611111	32.722222	54.833333	439.89458	36.66	58.842105	18.95
	D.O. % Level	8.3210526	6.3235294	7.044444	6.8823529	7.7092857	9.1931579	8.1084211	10.095	9.062105	7.5221053	4.5289474	7.6388889	92.42929	7.70	10.095	4.5289474
	Effluent pH	7.0126316	6.9152941	6.8366667	6.984444	6.2307407	7.3	7.205	7.2015	7.244737	7.0578947	6.8455556	6.875	83.709464	6.98	7.3	6.2307407
	Effluent Temp	7.9476471	8.565	10.08421	10.805263	12.468421	13.804545	18.04	18.468182	16.14286	13.21	13.128571	9.68	152.3447	12.70	18.468182	7.9476471
Plant	Wasting Vol. m3	44894	38105	58326	88086	83017	83511	58388	76478	73499	74218	61381	51002	790905	65908.75	0	0
	Chlorine (Kg)													0			
	Cl Dosage (mg/l)													0		0	0
	Cl Residual(mg/l)	0.0336842	0.0570588	0.0338889	0.0255556	0.0372222	0.0252381	0.0505556	0.0421053	0.0461905	0.0452941	0.0444444	0.0427778	0.4840155	0.04	0.0570588	0.0252381
Grit	Hauled (Volume)													0	0.00	0	0
Sludge Hauled	Liquid Volume	221.84929	443.69858	221.84929	332.77394	110.9	221.84929	221.84929	388.23394	221.84929	110.92465	554.62323	0	3050.4008			
Loading mg/L	Phosphorus	0.1675367	0.152726	0.4685981	1.2192213	0.9021946	1.8053283	0.4669009	0.6335458	0.38926234	0.4771141	0.5713962	0.1966574	7.4504819	0.6208735	1.8053283	0.152726
	BOD	11.642897	2.7860138	69.960484	80.051867	14.133794	60.277448	7.8092903	12.62619	8.75952	9.8785484	10.009813	4.9608774	292.89674	24.408062	80.051867	2.7860138
	Suspended Solids	6.0482581	4.8452414	45.268548	27.076367	32.764703	22.276448	11.536452	8.560129	6.2568	7.9028387	7.1498667	0	179.68565	14.973804	45.268548	0

PERFORMANCE

ASSESSMENT

REPORTS

SEWAGE PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: TOWN OF COCHRANE
 PROJECT: COCHRANE WPCP
 WORKS NUMBER: 12000355
 YEAR: 2016
 WATER COURSE: LILABELLE LAKE / ABITIBI RIVER
 DESIGN CAPACITY: 5,600 cu. meters/day

DESCRIPTION: Extended Aeration

MONTH	NITRATE INFLUENT (mg/l)	NITRATE EFFLUENT (mg/l)	NITRITE INFLUENT (mg/l)	NITRITE EFFLUENT (mg/l)	AMMONIA INFLUENT (mg/l)	AMMONIA EFFLUENT (mg/l)	PERCENT REMOVAL	TKN INFLUENT (mg/l)	TKN EFFLUENT (mg/l)	PERCENT REMOVAL	ORTHOPHOSPHATE RAW ¹ (mg/l)	ORTHOPHOSPHATE EFFLUENT ² (mg/l)	PERCENT REMOVAL
JAN	<0.1	9.37	<0.03	0.13	22.80	4.94	78.33	33.40	6.91	79.31	8.67	0.05	99.41
FEB	<0.1	14.60	<0.03	0.27	30.00	0.30	99.02	57.80	4.28	92.60	11.70	0.80	93.19
MAR	<0.1	9.55	0.07	0.45	13.60	0.64	95.31	22.00	8.06	63.36	3.50	0.28	91.89
APR	<0.1	0.28	0.14	0.04	20.70	1.48	92.87	23.20	6.59	71.59	5.54	0.08	98.53
MAY	<0.1	12.70	<0.03	0.07	16.80	0.19	98.89	29.00	2.50	91.38	7.54	0.16	97.84
JUN	1.32	5.08	0.08	0.11	6.77	0.55	91.82	11.30	6.20	45.13	1.09	0.15	86.33
JUL	<0.1	12.90	<0.03	0.03	17.50	0.18	98.95	23.80	2.90	87.82	3.73	0.08	97.83
AUG	0.10	17.40	<0.03	0.06	23.90	0.35	98.52	44.50	1.00	97.75	6.03	0.07	98.91
SEPT	1.10	18.30	<0.03	0.03	16.80	0.12	99.28	24.20	1.00	95.87	2.00	0.05	97.48
OCT	<0.1	20.20	<0.03	0.03	20.80	0.11	99.46	26.20	2.30	91.22	3.10	0.03	98.94
NOV	0.10	12.60	<0.03	0.03	18.70	0.24	98.74	34.00	4.22	87.59	5.84	0.05	99.21
DEC	<0.1	15.70	<0.03	0.03	14.80	0.15	98.99	23.80	1.50	93.70	5.12	0.06	98.83
TOTAL													
AVG		12.39		0.11	18.60	0.77	95.85	29.43	3.96	83.11	5.32	0.16	96.53
MAX													
CRITERIA													

COMMENTS:
¹Orthophosphate was done January to June. Phosphate was done July to December
²Orthophosphate was done January to June. Phosphate was done July to December

BYPASS SUMMARY
NOTIFICATION AND LAB RESULTS

Calibration Reports

Sewage Plant Flow Meters 2016

	height measured	height displayed on unit	flow on meter in L/s
Sewage inflow at bypass chamber	37.1 inches	37.2 inches	n/a
	35 inches	35.1 inches	n/a
	31.9 inches	32 inches	n/a
Influent flow meter East	0.99 m	1.00 m	54.22
	1.05 m	1.055 m	40.18
	1.09 m	1.104 m	26.77
	1.15 m	1.16 m	12.41
Influent flow meter west	0.99 m	0.99 m	55.24
	1.05 m	1.049 m	41.72
	1.095 m	1.102 m	28.31
	1.145 m	1.153 m	14.46
Contact chamber Effluent flow meter	1.00 m	1.005 m	24.2
	0.9 m	0.901 m	69.4
	0.77 m	0.791 m	144.83
	0.46 m	0.465 m	634.3
Contact chamber bypass effluent flow meter	0.70 m	0.69 m	114
	0.820 m	0.821 m	43
	0.975 m	0.974 m	4
	1.09 m	1.098 m	0

Cochrane PUC

Calibration Record Sheet 2016

Location: Sewage Treatment

Service: Sewage Inflow

Height measured	Height displayed on unit (into over flow)
37.1 inches	37.2 inches
35 inches	35.1 inches
31.9 inches	32 inches

This unit measures and height of the effluent flow into the treatment plant at the by-pass chamber. By placing an item under the sensors head and measuring the distance we were able to confirm if the unit is reading the height correct. As the flow is a mathematical formula (based off of the height as the variable) height is the condition that needs to be verified.

Chris Maynard

Instrumentation Technician

November 5 2016

Cochrane PUC

Calibration Record Sheet 2016

Location: Sewage Treatment

Service: Influent Flow Meter East

Height measured	Height displayed	Flow displayed L/s
0.99 m	1.00 m	54.22
1.05 m	1.055 m	40.18
1.09 m	1.104 m	26.77
1.15 m	1.16 m	12.41

This unit measures and height of the effluent flow into the treatment plant on the influent east side. By placing an item under the sensors head and measuring the distance we were able to confirm if the unit is reading the height correct. As the flow is a mathematical formula (based off of the height as the variable) height is the condition that needs to be verified.

Note: The measurement and reading is the distance from the head to the level.

Chris Maynard

Instrumentation Technician

November 5 2016

Cochrane PUC

Calibration Record Sheet 2016

Location: Sewage Treatment

Service: Influent Flow Meter West

Height measured	Height displayed	Flow displayed L/s
0.99 m	0.99 m	55.24
1.05 m	1.049 m	41.72
1.095 m	1.102 m	28.31
1.145 m	1.153 m	14.46

This unit measures and height of the effluent flow into the treatment plant on the influent west side. By placing an item under the sensors head and measuring the distance we were able to confirm if the unit is reading the height correct. As the flow is a mathematical formula (based off of the height as the variable) height is the condition that needs to be verified.

Note: The measurement and reading is the distance from the head to the level.

Chris Maynard

Instrumentation Technician

November 5 2016

Cochrane PUC

Calibration Record Sheet 2016

Location: Sewage Treatment

Service: Contact Chamber Effluent Flow Meter

Height measured	Height displayed	Flow displayed L/s
1.00 m	1.005 m	24.2
0.90 m	0.901 m	69.4
0.77 m	0.791 m	144.83
0.46 m	0.465 m	634.3

This unit measures and height of the effluent flow at the contact chamber. By placing an item under the sensors head and measuring the distance we were able to confirm if the unit is reading the height correct. As the flow is a mathematical formula (based off of the height as the variable) height is the condition that needs to be verified.

Note: The measurement and reading is the distance from the head to the level.

Chris Maynard

Instrumentation Technician

November 5 2016

Cochrane PUC

Calibration Record Sheet 2016

Location: Sewage Treatment

Service: Contact Chamber Bypass Effluent Flow Meter

Height measured	Height displayed	Flow displayed L/s
0.70 m	0.69 m	114
0.82 m	0.821 m	43.0
0.975 m	0.974 m	4.0
1.09 m	1.098 m	0.00

This unit measures and height of the effluent flow at the bypass of the contact chamber. By placing an item under the sensors head and measuring the distance we were able to confirm if the unit is reading the height correct. As the flow is a mathematical formula (based off of the height as the variable) height is the condition that needs to be verified.

Note: The measurement and reading is the distance from the head to the level.

Chris Maynard

Instrumentation Technician

November 5 2016