



**COCHRANE
WATER / WASTE WATER SERVICES**

**WASTE WATER TREATMENT
PLANT**

07/24/2013

2015 ANNUAL REPORT

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2015 Annual Report

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ANNUAL
PERFORMANCE
REPORT

ANNUAL SUMMARY 2015

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 (m ³)	16310	10894	38272	129294	71357	57859	42123	47806	34165	52091	52413	54885	607469	50622.417	129294	10894
Influent	Peak Rate (m3)	1365	1024	2599	12322	8303	7581	3606	4183	4645	4198	3118	5206	58150	4845.83	12322	1024
Bypass	Plant-Vol. (m3)				6199	2356.1	69.4	104.4	575.7					9304.6	1860.92	6199	69.4
	Time - Hrs				27.5	5.5	1.5	6.75	5.15					46.4	9.28	27.5	1.5
Raw	Susp. solids	503	226	430	160	35	89	136	43	183	115	120	85	2125	177.08	503	35
	BOD (mg/l)	114	246	484	163	46	113	233	54	126	122	116	90	1907	158.92	484	46
	TKN (mg/l)	23	44.2	23.8	33.4	13.1	18.7	18.6	16.7	37.1	30	34.3	22	314.9	26.24	44.2	13.1
	Phosphorus (mg/l)	5.11	5.01	3.34	3.99	0.63	1.77	1.64	0.71	3.22	3.36	3.32	2.53	34.63	2.89	5.11	0.63
	Ammonia (mg/l)	23	34.8	16.1	25.7	7.3	16	13.5	10.2	30.4	28.1	28.8	18.4	252.3	21.03	34.8	7.3
Effluent	Susp. Solids (mg/l)	25	20	22	16	37	14	20	12	6	9	10	6	197	16.42	37	6
	BOD (mg/l)	16	16	29	10	24	12	12	10	0	4	12	9	154	12.83	29	0
	Phosphorus (mg/l)	0.606	0.672	0.52	0.64	0.44	0.511667	0.1633333	0.324	0.246667	0.18	0.2516667	1.85	6.407334	0.53	1.85	0.1633333
	Ammonia (mg/l)	0.2028	0.04196	0.606	0.4256	1.12	1.26	1.25	2.626	0.161667	0.864	1.5583333	2.28	12.39636	1.03	2.626	0.04196
	Nitrate (mg/l)	14.4	14.5	0.6	11.6	3.99	1.57	8.31	10.9	0.17	14.3	7.23	16.1	103.67	8.64	16.1	0.17
	Nitrite (mg/l)	0.03	0.03	12.5	0.03	0.39	0.07	0.04	0.46	13.4	0.1	0.12	0.2	27.37	2.28	13.4	0.03
	TKN (mg/l)	0.8	0.5	2.9	0.5	6.9	9.8	0.5	3.4	2.2	0.5	3.8	1.7	33.5	2.79	9.8	0.5
	CBOD (mg/l)	6	9	6	4	11	0	4	10	0	2	3	3	58	4.83	162000	2960
	Fecal Coliform (CFU/100ml)	7400	23500	162000	37000	78000	93000	51000	62000	6500	33000	2960	103000	659360	30126.67	84000	2960
	Fecal Streptococcus (CFU/100ml)	3300	13500	15200	6300	8400	25000	13800	6900	1340	3800	1160	3400	102100	8508.33	25000	1160
	E.Coli (CFU/100ml)	4400	12800	10600	13300	78000	84000	3200	49000	2800	31000	2420	70000	361520	30126.67	84000	2420
Date	Air Used																
	Aeration Temp.	8.775	9.178	10.305	9.714	12.221053	13.11579	16.470588	17.25	16.927778	14.90556	12.511111	202.2	343.57388	28.63	202.2	8.775
	30 Min. S.S.	58.4	107.5	34.72	32.07	35.466667	36.78947	50.45	29.277778	42.333333	23.72222	37.722222	857	1345.4517	112.12	857	23.72222
	D.O. % Level	6.258	5.9	6.931	8.23	7.2157895	8.026316	7.2823529	10.68	4.0333333	7.983333	8.1388889	141.7	222.37901	18.53	141.7	4.0333333
	Effluent pH	7.067	6.9	6.961	7.13	7.2026316	7.092632	7.184	7.1263158	6.8776471	7.063684	7.096	148.13	225.83091	18.82	148.13	6.8776471
	Effluent Temp	6.585	7.405	10.6	10.22	12.725	13.88182	16.268182	17.268421	16.685714	13.62857	12.25	213.8	351.31771	29.28	213.8	6.585
Plant	Wasting Vol. m3	35033	30826	121047	39860	98197	86537	65262	73149	56043	61782	64568	74833	807137	67261.42	0	0
	Chlorine (Kg)													0			
	Cl Dosage (mg/l)													0		0	0
	Cl Residual(mg/l)	0.031	0.024	0.049	0.037	0.03	0.030556	0.023	0.0347368	0.0205556	0.0225	0.0564706	0.63	0.988819	0.08	0.63	0.0205556
Grit	Hauled (Volume)													0	0.00	0	0
Sludge Hauled	Liquid Volume	136.28	317.98	90.85	408.83	545.1	272.55	590.53	181.7	272.56	181.7	181.7	192.74	3372.52			
Loading mg/L	Phosphorus	0.32	0.26	0.64	2.79	1.022	0.986	0.2219384	0.231319	0.2809122	0.305825	0.4396868	0.5458992	8.0435806	0.6702984	2.79	0.2219384
	BOD	8.42	6.24	35.79	43.09	55.25	23.14	16.305677	15.42129	0.3754708	6.721419	20.9652	15.934355	247.65341	20.637784	55.25	0.3754708
	Suspended Solids	13.15	7.8	27.15	68.94	85.17	27	27.176129	18.50555	6.833	15.12319	17.471	10.622903	324.94177	27.078481	85.17	6.833

ANNUAL SUMMARY

Annual Performance Report

This report is prepared to comply with Section 23 of the Special Terms and Conditions of the Certificate of Approval Number 3-2436-88-916. The report shall contain:

- (i) A summary of all monitoring data and analytical data collected relative to the works during the 2014 reporting period;

FLOWS	
Total Flow	<i>607,469 cubic meters</i>
Average Daily Flow	<i>1,661 cubic meters</i>
Peak Hydraulic Flow	<i>12,322 cubic meters</i>

RAW SEWAGE RESULTS

RAW SEWAGE	MONTHLY AVERAGE RESULTS
BOD ₍₅₎	158.92 mg/l
SUSPENDED SOLIDS	177.08 mg/l
TOTAL PHOSPHORUS	2.89 mg/l
TKN (as N)	26.24 mg/l
AMMONIA	21.03 mg/l

FINAL EFFLUENT RESULTS

FINAL EFFLUENT	MONTHLY AVERAGE RESULTS
BOD ₍₅₎	12.83 mg/l
SUSPENDED SOLIDS	16.42 mg/l
TOTAL PHOSPHORUS	0.53 mg/l
TKN (as N)	2.79 mg/l
AMMONIA	1.03 mg/l
CHLORINE RESIDUAL	0.08 mg/l
NITRITE	2.28 mg/l
NITRATE	8.64 mg/l
CBOD ₍₅₎	4.83 mg/l
FECAL COLIFORM	30126.67 CFU/100ml
FECAL STREPTOCOCCUS	8508.33 CFU/100ml
E.COLI	30126.67 CFU/100ml

- (II) a comprehensive interpretation of all monitoring data and analytical data collected relative to the works during the reporting period of 2015, and a comparison to the effluent quality and quantity criteria described in Section 19;

The total flow in 2015 was 607,469 cubic meters which represents a 20.45 % decrease from 2014. The total flow in 2015 was 29 % of the average day flow design capacity.

The following represents removal efficiencies for the year 2015.

BOD ₍₅₎	88.10%
SUSPENDED SOLIDS	81.44%
TOTAL PHOSPHORUS	79.35%
TKN (as N)	85.60%
AMMONIA	93.68%
AVERAGE REMOVAL EFFICIENCY	85.63 %

The above represents a decrease in overall operating efficiency of 3.46% over the year 2014.

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 Suspended Solids (20 mg/L) and Phosphorus Criteria (1.0 mg/l), as specified in section 19 of the aforementioned certificate of approval.

Compliance - (Certificate of Approval) The peak hydraulic flow capacity of 11,500 cu. Meters / day was exceeded during the year 2015.

- (iii) a tabulation and description of any bypass or upset condition which occurred during the period being reported upon.

The bypass alarm signaled nine partial bypasses (overflows) for the year 2015.

DATE	DURATION (hours)	FLOW (m3)
April 11, 2015	3.25	216.30
April 12, 2015	47.08	5,295
April 16, 2015	9.08	687.7
May 27, 2015	5.50	2,356
June 10, 2015	5	214.9
July 7, 2015	1	69.4
July 25, 2015	1	35
August 2, 2015	1.5	208.1
August 13, 2015	2	367.6

These 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.

- (iv) a summary of any effluent assurance or control measures undertaken in the 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.

- (v) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works;

1. *Cleaned Contact Chamber*
2. *Cleaned Grit Chamber*
3. *Drained and Cleaned both side of the Aeration Zone*

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

(vi) a description of any operating problems encountered and corrective actions taken during the reporting period;

1. *Return Sludge Pump Failure – ordered a new pump.*

(vii) a summary of any proposed alteration, extension or replacement in the process or operation of the works to be completed over the next reporting period which may require approval under the Ontario Water Resources Act;

1. *Install manhole at headworks to accommodate external sewage dumping.*
2. *Install new blower and fine air bubble diffusers in aeration zone.*

(viii) a tabulation of the volume of sludge generated in the reporting period and an outline of anticipated volumes to be generated in the next reporting period;
(Attached is the sludge hauling schedule for 2015)

It is anticipated that sludge volume haulage for the year 2016 should be equal to or less than that of 2015 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

- (ix) an outline of the proposed sludge handling methods in disposal areas to be utilized over the next reporting period;

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.

- (x) an evaluation of the calibration and maintenance procedures conducted on all 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 2015 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 2016 the instruments will once again be checked for their accuracy.

- (xi) an evaluation of the need for modifications to the works to improve performance and reliability and to minimize upsets / bypasses;

As per section (vii)

At this time, the Town of Cochrane is evaluating the need for modifications to the works to improve performance and reliability and to minimize upsets / bypasses. One possible modification includes the addition of an aerated grit chamber at the head of the Plant. This would reduce wear, tear, and blockages caused by sand, gravel, and other abrasive and solid materials that can currently enter and shorten the lifespan of the mechanics that operate the Waste Treatment Plant. The purchase of an online DO meter connected to the blower system would reduce the electricity used by the plant, as the meter could shut the blower system off when a certain DO level is met and start the blower when required.

This is the report on the Cochrane Waste Water Treatment Plant for the year 2015. 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,
Melissa Hoogenhoud
Asset Coordinator

Respectfully submitted and reviewed by:

Lynn Chapleau
Compliance Supervisor

PERFORMANCE

ASSESSMENT

REPORTS

SEWAGE PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY:	TOWN OF COCHRANE	YEAR:	2015
PROJECT:	COCHRANE WPCP	WATER COURSE:	LILLABELLE LAKE / ABITIBI RIVER
WORKS NUMBER:	12000355	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	PHOSPHATE RAW (mg/L)	PHOSPHATE EFFLUENT (mg/l)	PERCENT REMOVAL
	JAN		14.40		0.03	23.00	0.20	99.13	23.00	0.80	96.52		
FEB		14.50		0.03	34.80	0.04	99.89	44.20	0.50	98.87			
MAR		12.50		0.60	16.10	0.61	96.21	23.80	2.90	87.82			
APR		11.60		0.03	25.70	0.43	98.33	33.40	0.50	98.50			
MAY		3.99		0.39	7.30	1.12	84.63	13.10	6.90	47.33			
JUN		1.57		0.07	16.00	1.26	92.13	18.70	9.80	47.59			
JUL		8.31		0.04	13.50	1.25	90.72	18.60	0.50	97.31			
AUG		10.90		0.46	10.20	2.63	74.25	16.70	3.40	79.64			
SEPT		0.17		13.40	30.40	0.16	99.47	37.10	2.20	94.07			
OCT		14.30		0.10	28.10	0.86	96.93	30.00	0.50	98.33			
NOV		7.23		0.12	28.80	1.56	94.59	34.30	3.80	88.92			
DEC		16.10		0.20	18.40	0.38	97.93	22.00	1.70	92.27			

TOTAL													
AVG		9.63		1.29	21.03	0.88	93.68	26.24	2.79	85.60			
MAX													
CRITERIA													

COMMENTS:

SLUDGE

HAULING SCHEDULE

2015 Dufour Sludge Hauling Schedule

Dufour Waste Disposal Inc. will be hauling sewage from our facility on the following dates:

January 6, 20, 2015

February 3, 17, 2015

March 2, 16, 30, 2015

April 13, 27, 2015

May 11, 25, 2015

June 8, 22 2015

July 6, 20, 2015

August 3, 17, 31, 2015

September 14, 28, 2015

October 12, 26, 2015

November 9, 23, 2015

December 7, 21, 2015

BYPASS SUMMARY

NOTIFICATION AND LAB RESULTS

Table 1 BYPASS AND OVERFLOW EVENTS

FACILITY NAME: **Cochrane Waste Water Treatment Plant** YEAR: **2015**

DATE: _____ Sample Results

Date (dd/mm/yy)	Location	Type (PB/SB/STPO /CSO/SSO/STWO)	Start Time	Duration (hours)	Volume (m3)	M/E	Disinfection (Y/N)	Treatment (Y/N)	Reason Code*	BOD5 (mg/L)	SS (mg/L)	TP (mg/L)	E.Coli (/100ml)
11/4/2015	Cochrane	STPO	5:15pm	3.25	216.30	M	N	N	2	43	190	1.22	970000
12/4/2015	Cochrane	STPO	1:30pm	47.08	5,295	M	N	N	2	34	148	0.669	490000
16/04/2015	Cochrane	STPO	4:20pm	9.08	687.7	M	N	N	2	29	62	0.572	400
27/05/2015	Cochrane	STPO	2:35pm	5.50	2,356	M	N	N	1	269	1080	4.49	12700000
10/6/2015	Cochrane	STPO	1:00pm	5.00	214.9	M	N	N	1	77	348	1.23	10700000
7/7/2015	Cochrane	STPO	3:25am	1.00	69.4	M	N	N	1	88	315	1.68	4100000
25/07/2015	Cochrane	STPO	9:40am	1.00	35	M	N	N	1	80	430	3.41	35000
2/8/2015	Cochrane	STPO	8:50pm	1.50	208.1	M	N	N	1	138	930	3.36	320000
13/08/2015	Cochrane	STPO	5:40pm	2.00	367.6	M	N	N	1	157	660	1.98	1500000

Legend

PB = Primary Bypass
 SB = Secondary Bypass
 STPO = Sewage Treatment Plant Overflow
 CSO = Combined Sewer Overflow
 SSO = Sanitary Sewer Overflow
 STWO = Satellite Treatment Works Overflow

M = Measured
 E = Estimated
 Y = Yes
 N = No

*Reason Codes:
 1 = Heavy Precipitation
 2 = Spring Runoff
 3 = Infiltration
 4 = Mechanical/Equipment Failure
 5 = Pipe Failures(break/leak/plugged)
 6 = Process Upsets
 7 = Power Outages
 8 = Unknown
 9 = Other, please comment below.

Comments:

Calibration Reports

Cochrane PUC

Calibration Record Sheet 2015

Location: Sewage Treatment

Service: Sewage Inflow

Height measured	Height displayed on unit (into over flow)
15.5 inches	1.65 inches
14.5 inches	1.75 inches
13.5 inches	1.85 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 2015

Cochrane PUC

Calibration Record Sheet 2015

Location: Sewage Treatment

Service: Influent Flow Meter East

Height measured	Height displayed	Flow displayed L/s
0.95 m	0.967 m	63.52
1.04 m	1.068 m	36.50
1.09 m	1.104 m	26.77
1.145 m	1.171 m	8.69

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 2015

Cochrane PUC

Calibration Record Sheet 2015

Location: Sewage Treatment

Service: Influent Flow Meter West

Height measured	Height displayed	Flow displayed L/s
0.95 m	0.97 m	61.68
1.04 m	1.075 m	35.11
1.09 m	1.102 m	28.31
1.145 m	1.171 m	9.04

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 2015

Cochrane PUC

Calibration Record Sheet 2015

Location: Sewage Treatment

Service: Contact Chamber Effluent Flow Meter

Height measured	Height displayed	Flow displayed L/s
0.70 m	0.72 m	211.7
0.80 m	0.844 m	105.7
0.90 m	0.932 m	51.57

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 2015

Cochrane PUC

Calibration Record Sheet 2015

Location: Sewage Treatment

Service: Contact Chamber Bypass Effluent Flow Meter

Height measured	Height displayed	Flow displayed L/s
0.90 m	0.921 m	10
1.00 m	1.019 m	1.00
1.05 m	1.060 m	0.08
1.09 m	1.100 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 2015

Sewage Plant Flow Meters 2015

	Height Measured	Height displayed	Flow on meter in L/S
Sewage inflow at	13.5 inches	1.85 inches	
By pass chamber	14.5 inches	1.75 inches	
	15.5 inches	1.65 inches	
Influent flow	0.95 m	0.967 m	63.52
meter east	1.04 m	1.068 m	36.50
	1.09 m	1.104 m	26.77
	1.145	1.171 m	8.69
Influent flow	0.95 m	0.97 m	61.68
meter west	1.04 m	1.075 m	35.11
	1.09 m	1.102 m	28.31
	1.145 m	1.171 m	9.04
Contact chamber	0.70 m	0.72 m	211.7
effluent flow	0.80 m	0.84 m	105.7
	0.9 0 m	0.932 m	51.57
Contact chamber	0.90 m	0.921 m	10
Effluent bypass	1.00 m	1.019 m	1.00
Flow meter	1.05 m	1.060 m	0.08
	1.09 m	1.100 m	0.00