

CH2MHILL®

**TOWN OF
PETROLIA**
WATER
POLLUTION
CONTROL
PLANT

2013
Annual Report



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Executive Summary

CH2M HILL is pleased to present the Town of Petrolia with this annual report for the 2012-2013 project year outlining the Petrolia Water Pollution Control Plant (PWPCP) and collection system past performance.

The Town of Petrolia Water Pollution Control Plant (WPCP) was constructed in 1978 to replace the existing Lagoon (2) treatment system.

The original (1978) plant included an extended mechanical aeration process complete with secondary clarification, phosphorous removal, continuous polishing and disinfection. Sludge is aerobically digested and up until 1997 was thickened and trucked off site for disposal and later land applied. Since 1997 sludge has been sent to one of the lagoons for treatment. Upgrades to the treatment plant have included ultraviolet (UV) disinfection in 1995, variable-frequency drive (VFD) on the pumps at the main lift station in 1996, replacement of the manual bar screen with an automatic step screen in 1999, and replacement of the filter media in May of 2010. The plant had a design capacity of 3,800 m³/day and is currently treating on average 2,446 m³/day since 2002. The WPCP is a tertiary extended aeration plant with two large lagoons, one used to store digested sludge, and the other to use as a backup system in the event the plant requires maintenance. The plant consists of grit removal, mechanical aeration, supplemental jet aeration, clarification, sand filtration, and ultraviolet disinfection. The collection system consists of 11 pumping stations. An amendment to the C of A was applied for in 2002 and approved by the Ministry of Environment (MOE) Approvals Branch to have the plant re-rated from 3,180 m³ to 3,800 m³ based on the installation of two 30hp Jet Aspirators in the aeration tanks. Another amendment to the C of A was applied for in 2008 and approved by the MOE to clarify lagoon discharge criteria.

This report will highlight important points of operational progress made over the year in Safety, Operations, Maintenance, Laboratory and Community Involvement.

Operations



Exhibit 1 indicates the flow loadings accepted for the contract year at the wastewater treatment facility.

Exhibit 1

Influent Flows

Influent Flows		
Month	Average m ³ /d	Total m ³ /day
Aug-12	1,880	58,279
Sep-12	2,180	65,411
Oct-12	1,965	60,910
Nov-12	2,035	63,099
Dec-12	2,140	66,353
Jan-13	2,701	81,036
Feb-13	2,108	59,022
Mar-13	2,540	78,751
Apr-13	3,136	47,046
May-13	4,490	139,188
Jun-13	2,652	79,563
Jul-13	1,765	54,723

Scope of Services

CH2M HILL was contracted by the Town of Petrolia, Ontario in 1995 to manage the Town's Water Pollution Control Plant and all the existing pump stations.

In 2012, these facilities serviced a population of approximately 5500 people.

CH2M HILL performs operations and maintenance (O&M) services including:

- Wastewater Treatment O&M
- Operate the 3,800 m³/day treatment facility
- Permit and routine process sampling in accordance with the Certificate of Approval
- Preventative and Corrective Maintenance of treatment processes
- Grounds and Facility Maintenance
- Operate and Maintain 11 pump stations

Staff Training/Certification

The staff at Petrolia attends monthly safety training sessions that include a variety of safety topics such as: Emergency plans, Electrical Safety, Hand Safety, Ladder Safety, Confined Space, Fit testing for masks, etc. The staff also had some on the job training where outside professionals taught onsite specifically on equipment such as: Gas Detectors, Overhead Crane operation, Milltronics, and Maintenance Connect. Two conference's were attended, The Ontario Good Roads and Maintenance Connect. Other training included: an exam preparation course, leadership competency course, team building, first aid/CPR, and working in and around confined spaces. Staff also participated in online training through CH2M HILL. Staff also successfully acquired their level 3 Waste Water Treatment Operator's license for the MOE of Ontario.

Accomplishments

Our team has worked tirelessly this past year to keep the plant running efficiently as possible and here are some of the highlights:

- Implemented a new computerized maintenance management system (CMMS) Program to incorporate a preventative and corrective maintenance program.
- Reduced the volume of sludge entering the lagoons by supernating back to the plant and extending the sludge retention time of the aerobic digesters.
- Updated and revised Operations and Sampling Plans.
- Replaced the existing VFD at Main Pump Station in order to reduce electricity consumption and eliminate fluctuations in influent to the plant.
- Brought on a new Project Manager shared with the Oil Springs project.



Laboratory

Ensuring the wastewater plant remains in compliance is our main laboratory objective. Samples are taken on a daily and weekly basis and some analysis is performed at the plant, while others are sent to an accredited laboratory for supplemental analysis. **Exhibit 2** outlines our effluent parameters.

Exhibit 2

Effluent Limits

Effluent Limits		
Effluent Parameter	Concentration	Waste Loading
CBOD ₅	10.0 mg/L	38.0 kg/day
Total Suspended Solids	10.0 mg/L	38.0 kg/day
Total Phosphorus	1.0 mg/L	3.8 kg/day
Total Ammonia Nitrogen (May 1 – Nov. 30)	3.0 mg/L	11.4 kg/day
Total Ammonia Nitrogen (Dec 1 – Apr 30)	7.0 mg/L	26.6 kg/day
E. Coli (Apr 1 – Nov 30)	200 organisms/100 mL	
pH of the effluent maintained between 6-9.5 at all times		



Exhibit 3 shows the actual monthly averaged results. The facility was in compliance with the requirements of the discharge permit and met effluent quality limits.

Exhibit 3

Monthly Average Final Effluent Results

Monthly Average Final Effluent Results August 2012 – July 2013						
Month	CBOD ₅	T.S.S	T.P	NH ₃	E.Coli	pH
Aug-12	2	1.8	0.67	0.25	2	7.07
Sept-12	2	1.625	0.61	0.64	2	7.11
Oct-12	2.2	3.2	0.82	0.62	3	7.55
Nov-12	3.5	1.025	0.65	1.04	2	7.65
Dec-12	3	0.9	0.45	0.19	2	7.33
Jan-13	3.6	4.14	0.48	0.72	7	7.07
Feb-13*	n/a	n/a	n/a	n/a	n/a	n/a
Mar-13	6.75	7.525	0.63	1.31	30	6.91
Apr-13	8	6.975	0.55	1.73	10	7.11
May-13	6.25	5.525	0.85	2.53	4	7.35
Jun-13	2.25	1.45	0.50	1.85	6	7.76
Jul-13	2.2	1.52	0.32	0.31	2	7.41

*Filter was down for repairs and effluent diverted to the lagoon.

Maintenance

Starting in January, 2013 we began implementing a new preventative maintenance program (CMMS). Weekly preventative maintenance work orders are printed and completed by operations. Work is ongoing to eliminate the printing and have operations complete the work orders online.

- **August**—Repairs on filter
Repairs on a return activated sludge (RAS) telescopic valve
- **September**—First ave pump repair
Clarifier skimming arm repaired
- **October**—Further repairs to filter
Step screen removed for repair
- **November**—Removed East aspirator for repair
- **December**—VFD at main pump station down for repair
- **January**—Filter repairs ongoing
South clarifier skimming arm failed
Greenfield pump station pump pulled for repair
- **February**—South clarifier back in service but top skimming arm disconnected
Filter repairs ongoing. Filter down.
- **March**—Filter back in service
Blower timer changes – from 15 min on and 15 min off to 1 hour on and 15 min off
Greenfield new check valve installed.
- **April**—UV system repairs
Discharging west lagoon
RAS pump #1 removed for repairs
Power surge damaged influent meter
North Clarifier taken down for motor repairs
- **May**—South East mixer motor repairs
New main breaker installed at Barrats lane pump station
- **June**—Filter repairs ongoing
North clarifier back in service
East aspirator back in service
- **July**—New Miltronics unit installed at Garfield pump station
West aspirator removed for repairs
RAS pump #1 removed for repair
Digester sludge pump repaired.

Safety

Staff safety is CH2M HILL's top priority and an integral part of maintaining Petrolia's waste water treatment plant and pumping stations to keep them operational. Our employees are our biggest asset and we rely on them to not only arrive to work safely but go home to their families safely too.

We are proud to announce that our Petrolia staff encountered zero accidents in this project year.

Community Involvement

The following is a list of ways in which CH2M HILL has contributed to the Petrolia community:

- Contributions made to the Mayor's annual Golf Tournament
- Contributions made to the Petrolia Victoria Playhouse
- Contributions made to the Oil Heritage District Community Golf tournament.



Going Forward

The future at the Petrolia WPCP is looking bright; the plans for the upgrade are nearing completion. Plans for the following year include cleaning out the aeration tanks and grit channel and reducing flow to the lagoons with the hopes that we in turn reduce the volume of seasonal discharge to the receiving stream.



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