Chippewas of the Thames First Nation (Band No. 166)

Date of Visit: March 27, 2001
By M.J. Newland (OCWA)
Site Address: R.R. #1
Mancey, ON N0L 1Y0
Phone No.: 519-264-9427 **Fax No.:** 519-289-2230
Tribal Council Affiliation: Southern First Nations Secretariat
Operators: Wayne French, Allen Riley
Location: The Chippewas of the Thames community is located approximately 30 km southwest of London - take Hwy. 2 west from London and exit onto Hwy. 18 southeast of Melbourne
Population: 824 people in the community (November 2000 - INAC)
No. of Units: 284 housing units (CAIS)

Description of the Community Water Supply

Based on the CAIS report, water to the houses in the Chippewas of the Thames community is treated as follows:

- 670 people are serviced by a groundwater communal water system; and
- 154 people are serviced by individual wells.

- 231 houses are serviced by a groundwater communal water system; and
- 53 houses are serviced by individual wells.

Description of the Community Sewage Facilities

Based on the information supplied to OCWA, sewage from the houses in the Chippewas of the Thames community is treated as follows:

- 84 people are serviced by a communal sewage system;
- 574 people are serviced by individual septic tanks; and
- 166 people have other sewage services.

- 29 houses are serviced by a communal sewage system;
- 198 houses are serviced by individual septic tanks; and
- 57 houses have other sewage services.

3.0 Overall Assessment for Communal Water Treatment Supply

The questionnaire developed by PWGSC required OCWA to undertake a risk assessment of the Water Source, Design, Operation, Reporting, and Operators. To properly assess these areas, a revisit to the water treatment facilities would be required.

OCWA was requested to undertake the evaluation without a visit to the site. With the available information, OCWA has undertaken the requested assessment of the facilities.

The ranking system used is as follows:

0 = Not enough information to assess
1-4 = Low Risk
5-7 = Medium Risk
8-10 = High Risk

For more detailed information on the Risk Assessment used see the Terms of Reference, Appendix B.

SECTION Water	SECTION RANKING Water	RISK Water
A. Water Source		
Biological	0	
Chemical	6	Sodium exceedances
Physical	6	Hardness exceedances
Overall Ranking for Water Source	10	Thames River floods over well source – poor raw water quality
B. Design		
Biological	8	22 exceedances noted (3.3%)
Chemical	6	Sodium exceedances
Physical	6	Hardness exceedances
Risk to Public Health	1	No boil water advisories
Condition of Laboratory Equipment	0	
Overall Ranking for Design	5	
C. Operations		
Reservoir Cleanliness	0	
Emergency Plan	0	
Overall Ranking for Operations	10	Chlorine equipment malfunctioning
D. Reporting		
Ranking for Laboratories and Testing	1	Health Services conducts tests weekly
Ranking for Boil Water Advisories	1	No boil water advisories
Overall Ranking for Reporting	1	

SECTION Water	SECTION RANKING Water	RISK Water
E. Operators		
Overall Ranking for Operators	7	Has received training however is not confident to run plant
F. Statistical Data		
Overall Ranking for Individual Wells	8	16 exceedances noted
Overall Ranking for the System	10	High Risk

4.0 Overall Assessment for Communal Sewage Treatment Facilities

The questionnaire developed by PWGSC required OCWA to undertake a risk assessment of the Effluent Receiver, Design, Operation, Reporting, and Operators. To properly assess these areas, a revisit to the sewage treatment facility would be required.

OCWA was requested to undertake the evaluation without a visit to the site. With the available information, OCWA has undertaken the requested assessment of the facilities.

The ranking system used is as follows:

0 = Not enough information to assess
1-4 = Low Risk
5-7 = Medium Risk
8-10 = High Risk

For more detailed information on the Risk Assessment used see the Terms of Reference, Appendix B.

SECTION Sewage	SECTION RANKING Sewage	RISK Sewage
A. Effluent Receiver		
Overall Ranking for Effluent Receiver	0	
B. Design		
Quality of Treated Effluent	2	1 exceedance of E. Coli noted
Ranking of Design of Sewage Plant	0	
Ranking of Concerns and Hazards within the Plant	5	No safety equipment
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	4	
C. Operations		
Ranking for Emergency Plan	0	
Overall Ranking for Operations	4	Service disruption experienced due to pump failure
D. Reporting		
Overall Ranking for Reporting	1	Samples taken every two months but not available from Health Canada.
E. Operators		
Overall Ranking for Operators	4	Trained and confident
F. Statistical Data		
Overall Ranking for Individual Septic Tanks	0	
Overall Ranking for the Systems	4	Low Risk

5.0 Communal Water Treatment Supply (231 houses)

5.1 Water Source

The raw water is drawn from groundwater.

Date	Result	GCDWQ Limit
May 23, 2000	No Exceedances	

5.2 Design

The Chippewas of the Thames community is serviced by a water treatment plant constructed in 1991. The rated design capacity of the plant is 537 m^3/d, and currently is well below capacity, at approximately 250 m^3/d. The raw water is drawn from groundwater. There is an off-site water tower with the capacity of 983 m^3.

The following table summarizes the chemical data available from Health Canada:

Date	Exceedance	Result	GCDWQ Limit
Jun. 19, 2001	Hardness	369 mg/L	80 – 100 mg/L (OG)
	Sodium	23.7 mg/L*	200 mg/L* (AO)

OG – operational guideline
*Health officer should be noted when the sodium content is above 20 mg/L for people on sodium restricted diets.

The water treatment plant operators expressed a serious concern with respect to the location of the wells, which are located in the floodplain of the Thames River. During high flow periods in the river, the wells can be submerged, resulting in the potential for infiltration of surface water into the wells. A potential for a surface water induced well supply could exist at this location. In the event of a well pump failure during river high flows, operations staff has no means of undertaking repairs until the river returns to normal levels.

5.3 Operations

The treatment plant consists of chlorination only. Sodium hypochlorite is used for disinfection. The disinfection equipment is functional with sufficient sodium hypochlorite on site. There is an on-line chlorine residual analyzer, which is not calibrated. The analyzer has not operated properly since it was installed and engineers have not been able to repair it. Chlorine injection points need to be modified. Chlorine residual is being manually checked by the operator everyday. The operators are not familiar with calibrating the chlorine equipment. The colilert unit is also used by the operator every day.

There is no diesel operated backup power generators for fire protection or water treatment plant. There is insufficient safety equipment at the plant such as protective clothing and face shields for chemicals.

There are safety concerns with the transportation of the 45-gallon drums of sodium hypochlorite. The plant does not have the correct equipment to safely transport these drums.

There is adequate ventilation for the plant and chemical storage area, laboratory, office area and workshop area with appropriate tools to perform maintenance. The tools used to perform maintenance are obtained from the sewage treatment plant.

There are maintenance manuals for plant equipment on site and as-built drawings but no operating manuals on site. Emergency spare parts are available, however there is no contact listing of technicians/trades people available. The response for such personnel is about 24 hours.

There is an annual hydrant flushing and maintenance program but no main valve operating/ maintenance program. In the last two years, a service disruption was experienced due to a watermain break.

5.4 Reporting

Health Canada conducts bacteriological testing every week on the communal water system. The results and analysis are kept at the Band Office.

The following table summarizes the bacteriological data available from Health Canada:

Period	Frequency	Regularity	Exceedances
99/10/13 to 01/07/04	1 per week	▪ Testing conducted on a regular basis	▪ There were 22 exceedances of total coliform/E. Coli noted for the given period (3.3%)

Resampling of exceedances should be conducted to determine the reason for the exceedance. In the last two years, there has not been any disease or other health related outbreaks. Health Canada has not issued any boil water advisories on the communal water system.

The turbidity of the treated water is recorded daily and there have been exceedances in turbidity readings. Chemical analyses of the treated water are conducted yearly by Health Canada. It is unknown whether there are chemical analyses that exceed the GCDWQ due to the fact that the plant does not receive any of the results.

6.0 Communal Sewage System (29 houses)

6.1 Effluent Receiver

The effluent is discharged into Dolson Creek.

6.2 Design

The community is serviced by a sewage treatment plant constructed in 1998. The rated design capacity is unknown. The treatment plant is not classified.

The facility is a sequence batch reactor (SBR) with alum addition. The method of disinfection used is UV. The UV equipment is functional. The sewage pumping stations are cleaned weekly. The chemicals are not stored in accordance with MOE guidelines.

There is no diesel operated backup power generator for the treatment plant. There has not been any raw sewage bypassing from the pumping station.

There are adequate office and workshop areas with appropriate tools to perform maintenance. There is adequate ventilation and chemical storage area.

6.3 Operations

Some safety hazards include no confined space entry equipment or training. There is no adequate safety equipment on site, such as confined space equipment and face shields for chemicals.

There are maintenance manuals for plant equipment and as-built drawings, but operating manuals are not available on site. Emergency spare parts are not available but there is a contact listing of technicians/trades people whom are available within 24-hour response time.

In the last two years, there has been a service disruption due to a pump failure.

6.4 Reporting

Effluent samples are taken by the operators every two months and taken to private laboratories for analysis. The results are recorded and kept at the plant.

Date	Sample	Result (E.Coli/100 mL)	Guideline (E.Coli/100 mL)
Jun. 8, 2000	Raw Sewage	1.3×10^5	-
	Treated Effluent (post UV)	210	200
Oct. 18, 2000	Raw Sewage	1.8×10^4	-
	Treated Effluent (post UV)	<10	200
Dec. 19, 2000	Raw Sewage	4.1×10^4	-
	Treated Effluent (post UV)	<10	200

Other sample results were not available from Health Canada.

There have been no disease or health outbreaks in the last two years, no improper discharges, no odour complaints, no sewage collection backups and no basement flooding.

7.0 Personnel s.19(1)

Wayne French and Allen Riley are the operators at the water and sewage treatment plants. [redacted]

8.0 Deficiencies in the Communal Water Supply

1. Wells are located in the Thames River floodplain and during periods of high flow, the well casings are submerged, resulting in the potential for surface water contamination.

2. Wells located in the floodplain could be a source of surface water contamination if they are influenced by the river.

3. Safety equipment is available on site except for eye shields and safety clothing for chemicals.

4. There are maintenance manuals for plant equipment and as-built drawings, but no operating manuals for the plant on site.

5. The operator does perform a hydrant flushing and maintenance program but no valve operating and maintenance program is in place.

6. Service disruptions include a watermain break.

7. Re-occurring operational problems include the sodium hypochlorite injectors being continuously plugged. Routine maintenance of the hypochlorite injectors requires taking the entire plant out of service to clean the injectors.

8. There is no written contingency plan available.

9. Record keeping needs improvement

10. The chlorine equipment was working and a free chlorine test is done once a day along with continuous testing done by the on-line chlorine analyzer. However, the on-line chlorine analyzer has not been functioning properly and may not be calibrated.

11. Chemical analyses and turbidity tests of treated water are performed by Health Canada, but the operators are unaware of the test results.

12. There have been exceedances in turbidity readings.

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13. The operators [redacted]t have received training to operate and maintain the facility. Additional training that can lead to certification is recommended.

14. There is a safety concern with the transportation of the 45 gallon drums of Sodium Hypochlorite.

8.0 Deficiencies in the Communal Sewage Facilities

1. There are maintenance manuals and as-built drawings, but no operating manuals on site.

2. Service disruption has been caused by pump failures. There is no backup power for the sewage treatment facility.

3. Alum storage does not meet MOE guidelines.

4. All the equipment and training necessary for confined space entry is required.

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5. [redacted] have received training to operate and maintain the facility. Additional training that can lead to certification is recommended.

6. Samples are taken by plant personnel every two months and taken to private labs for analysis.

9.0 Classification

Based upon the terms of reference - Appendix I – Plant Classification Guideline developed by Public Works and Government Services Canada and with discussions with the Ontario Ministry of the Environment Classification Group, OCWA classified these plant as follows:

Water Treatment Facility-	Class I
Sewage Treatment Facility-	Class II

10.0 Recommendations - Action Required

- Implement program to protect well sources from river flooding.
- Undertake study to review potential for surface water influence on well supply.
- Set up protocol so the operators receive the bacteriological test results from Health Canada.
- Discontinue use of 45-gallon drums of sodium hypochlorite and use of 20-litre containers, or purchase proper drum handling equipment.
- Repair chlorine residual analyzer and injection chlorine points.
- Implement a main valve operating/maintenance program.
- Implement a training program for the operators that can lead to certification.
- Establish and implement a protocol for taking water samples at the water treatment plants, including raw water samples.
- Consider backup power for the water treatment plant.
- Review and purchase required safety equipment.
- Develop and implement a general maintenance program at the facilities.
- Develop a comprehensive community water supply contingency plan.
- Develop and initiate a process control program
- Implement a preventive maintenance program.
- Develop a contingency plan for emergency situations at the sewage treatment plant.
- Review alum storage.
- Increase sampling frequency at the sewage facilities.
- Purchase spare parts.

11.0 Overall Community Risk Assessment

Water Category – High Risk

- **High Risk because of the following:**
  - Repair chlorine analyzer and injection points; and
  - Thames River floods over well source.

Sewage Category – Low Risk

Note: **Information within this report is based on discussions with the plant operators and a quick visual walkthrough of the facilities. No detailed review was undertaken by OCWA.**