

## Chapleau Cree First Nation (Band No. 23)

**Date of Visit:** February 28, 2001

By George Culhane

**Site Address:** P.O. Box 826, Fox Lake Road

Chapleau, ON P0M 1K0

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**Tribal Council Affiliation:** Mushkegowuk Tribal Council

**Operators:** Ian Fortin, Jerry Mercier, Mike Cachagee (part-time)

**Location:** The Chapleau Cree First Nation community is located 160 km northeast of Sault Ste. Marie

**Population:** 68 people in the community (December 2000 - INAC)

**No. of Units:** 26 housing units (CAIS)

### 1.0 Description of the Community Water Supply

Based on the CAIS report, water to the houses in the Chapleau Cree community is treated as follows:

- 68 people use piped water
- 26 houses are serviced by a communal water system.

### 2.0 Description of the Community Sewage Facilities

Based on the CAIS report, sewage from the houses in the Chapleau Cree community is treated as follows:

- 68 people use septic tanks
- 26 houses are serviced by individual septic tanks.

### 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.

<b>SECTION Water</b>	<b>SECTION RANKING Water</b>	<b>RISK Water</b>
<b>A. Water Source</b>		
Biological	0	No data available
Chemical	7	Turbidity, iron, manganese, aluminum exceedances
Physical	6	Color, dissolved organic carbon, hardness exceedances
Overall Ranking for Water Source	7	
<b>B. Design</b>		
Biological	1	1 exceedance out of 86 available samples
Chemical	8	THMs exceedance
Physical	1	
Risk to Public Health	10	
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	5	
<b>C. Operations</b>		
Reservoir Cleanliness	0	Not inspected
Emergency Plan	10	No plan
Overall Ranking for Operations	4	No chlorine residual analyzer
<b>D. Reporting</b>		
Ranking for Laboratories and Testing	1	Monthly by Health Canada
Ranking for Boil Water Advisories	0	No data available
Overall Ranking for Reporting	1	

<b>SECTION Water</b>	<b>SECTION RANKING Water</b>	<b>RISK Water</b>
<b>E. Operators</b>		
Overall Ranking for Operators	2	Trained and confident
<b>F. Statistical Data</b>		
Overall Ranking for Individual Wells	0	
Overall Ranking for the System	10	High Risk

## 4.0 Communal Water Supply (26 houses)

### 4.1 Water Source

Two wells supply the raw water for this community.

The following table summarizes the treated water data available from Health Canada, which does not meet GCDWQ:

Date	Location	Exceedances	Result	GCDWQ limit
Nov. 29, 2000	Raw Water	Color	16 TCU	15 TCU (AO)
		Dissolved Organic Carbon	6 mg/L	5 mg/L (AO)
		Hardness	69 mg/L	80 to 100 mg/L (OG)
		Turbidity	1.9 NTU	1 NTU (HL)
		Aluminum	0.28 mg/L	0.1 mg/L (OG)
		Iron	0.33 mg/L	0.3 mg/L (AO)
		Manganese	0.08 mg/L	0.05 mg/L (AO)

AO = aesthetic objective, HL = health limit, OG = operational guideline

### 4.2 Design

The Chapleau Cree community is serviced by a water treatment plant constructed in 1994. Each well is equipped with a pump rated for a total capacity of 4.6 L/s. The well water is chlorinated before passing through a flow meter on each well line. The water then travels through two pressure filters and into cell #1 of a two-celled reservoir. The reservoir is 180 m<sup>3</sup> and is buried below grade. From cell no. 1 of the reservoir, the water passes through a valve to cell #2. Three high lift pumps, each with a total capacity of 5.7 L/s, supply the distribution system from cell #2. Pressure tanks are used to maintain the required system pressure and a final water meter measures the flow rate to the distribution system.

The following table summarizes the treated water data available from Health Canada, which does not meet GCDWQ:

Date	Location	Exceedances	Result	GCDWQ limit
May 20, 1999	Treated Well	Hardness	109 mg/L	80 to 100 mg/L (OG)
		THM	0.246 mg/L	0.1 mg/L (HL)

AO = aesthetic objective, HL = health limit, OG = operational guideline

There is a valve provided between cell #1 and cell #2 of the reservoir for cleaning of the first cell while using only the second cell.

The plant has a diesel-operated backup power generator for fire protection and it is tested on a regular basis. The plant also has a fire pump that is connected to cell # 2 of the reservoir. The plant lacks confined space entry equipment and there is no lock out station for pump repair. The plant does not have a first aid kit or fire extinguishers.

There is an annual hydrant flushing and maintenance program, as well as a main valve operating and maintenance program.

### 4.3 Operations

The plant uses 12% sodium hypochlorite for chlorination. The disinfection equipment is functional and there is a sufficient supply of chlorine on site. There is no on-line chlorine residual analyzer but the chlorine residual is checked once per day.

The plant has operating and maintenance manuals and as-built drawings on site. Emergency spare parts are available on site. There is a contact listing of technicians/trades people available and the response for such personnel is 48 hours.

In the last two years, service disruptions have been experienced due to a well pump motor burning out caused by the pumping rate exceeding the well capacity of well #1. Water shortages were reported and as a result, in September 2000, Neegan Burnside conducted an investigation into the problem and summarized their findings in a report dated November 3, 2000. Downhole videos of the wells indicated that iron was plugging the top two sections of the screen in each well. As a result, a physical and chemical rehabilitation of the wells was undertaken which restored the wells to their original capacity. However, in the following four months since the rehabilitation, the well capacity declined again and currently the pump motor burn out is still a re-occurring operational problem. A Neegan Burnside "Water Quality and Recommendations for New Well Construction" study dated February 15, 2001 recommends that a third production well should be installed.

### 4.4 Reporting

Gilles St. Pierre of the Health Canada First Nations & Inuit Health Branch in Timmins conducts bacteriological testing on a monthly basis. The results are kept at the Health Canada office and the Band office.

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

Period	Frequency	Regularity	Exceedances
99/10/27 to 2001/09/18	3 to 11 times per month from different locations	<ul style="list-style-type: none"> <li>▪ 1 month missing in 1999</li> <li>▪ 6 months missing in 2000</li> <li>▪ 3 months missing in 2001</li> </ul>	<ul style="list-style-type: none"> <li>▪ Total coliform exceedance was noted on 2001/07/24</li> </ul>

The turbidity of the treated water is tested on an annual basis and exceedances have been recorded. The Neegan Burnside study dated February 15, 2001 attributes elevated turbidity to the elevated iron in this well supply, which could cause iron to precipitate out while the sample is en route to the laboratory.

A chemical analysis of the treated water is conducted once per year and there have been exceedances in the aesthetic objective (AO) for manganese and hardness and the Maximum Allowable Concentration (MAC) for THMs. Raw water samples have also exceeded the AO for colour, although the treated water colour results show improvement from the raw water. Neegan Burnside had recommended that the carbon filters should be changed, which would further improve the colour of the treated water. The GAC is in place to reduce colour and trihalomethanes, and the study suggests that the exceedances of trihalomethanes may be because the GAC has reached its absorptive capacity and requires replacement or regeneration.

#### 4.5 Operators

Ian Fortin, Jerry Mercier and Mike Cachagee are the operators of the water treatment plant. Ian Fortin and Jerry Mercier are full time operators while Mike Cachagee is part time. [REDACTED]

s.19(1)

[REDACTED] all operators have received on-going training ([REDACTED])

The operators are familiar with the calibration and maintenance of the disinfection equipment [REDACTED]. A comprehensive ongoing training program is suggested for the operators.

[REDACTED]

#### 5.0 Deficiencies in the Community Water Supply

1. Safety equipment that is required includes confined space entry equipment, a lock out station to avoid electrical accidents, a first aid kit and fire extinguisher.
2. There is no on-line chlorine residual analyzer but the chlorine residual is tested daily.
3. The community has a hydrant flushing and maintenance program in place but no valve operating and maintenance program on the water distribution system.
4. There is no written contingency plan available.
5. Service disruptions have been experienced because of well pump motor burning out. This problem is related to the reduced well capacity, possibly caused by iron fouling plugging up the well intake screens.
6. A chemical analysis of the treated water is conducted once per year. Turbidity, manganese and trihalomethanes have been exceeded in the treated water. An engineering study has recommended replacing the carbon filters and replacing/regenerating the Granular Activated Carbon to reduce the trihalomethanes.
7. The operators are not certified but are receiving ongoing training from the Circuit Rider Training Program. The operators are interested in becoming certified.

#### 6.0 Recommendations

- Address water shortage problems in the system.
- Repair non-operational pressure filters.
- Correct well capacity and pump burnt out problem.
- Replace carbon filters and replace/regenerate Granular Activated Carbon.
- Implement an annual valve operating and maintenance program on the water distribution system.
- Purchase confined space entry equipment, electrical lock out station, first aid kit and fire extinguisher.
- Implement a training program that can lead to certification of the operators.
- Establish and implement a protocol for taking water samples at the water treatment plant.
- Consider installation of an on-line chlorine residual analyzer. This could save operators time in sampling every day.
- Develop a comprehensive contingency plan to address operational problems, breakdowns, vacations and sickness, main breaks and boil water advisories.

- Implement a sewage septic tank inspection program to inspect all septic tanks in the community for proper operations and meeting the required standards.

## **7.0 Plant 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 this plant as follows:

Water Treatment Facility - Class I

## **8.0 Overall Community Risk Assessment**

### **Water Category - High Risk**

- **High Risk because of the following:**
  - Re-occurring operational problems due to limited well capacity; and
  - Exceedances in GCDWQ for turbidity, magnesium and THM's.
  - Repair pressure filters.

**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.**