

Moose Cree First Nation (Band No. 144)

Date of Visit: February 5, 2001

By John McGhee (OCWA)

Site Address: P.O. Box 190

Moose Factory, ON P0L 1W0

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Tribal Council Affiliation: Mushkegowuk Tribal Council

Operators: Bill Carpenter, Bob Echum, Melvin Alisapi, Mike Dempsey, Lary Corston

Location: The Moose Factory First Nation community is located approximately 300 km north of Timmins, on Factory Island, and is accessible by air, boat in summer, and ice road in winter

Population: 1,443 people in the community (December 2000 - INAC)

No. of Units: 372 housing units (CAIS)

1.0 Description of the Community Water Supply

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

- 1439 people use piped water
- 4 people have no services

- 371 houses are serviced by a communal water system; and
- 1 house has no services.

2.0 Description of the Community Sewage Facilities

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

- 1439 people use piped sewage
- 4 people have no services

- 371 houses are serviced by a communal sewage system; and
- 1 house has no 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	0	
Physical	0	
Overall Ranking for Water Source	0	No data available
B. Design		
Biological	1	3 HPC exceedances out of 644 available samples
Chemical	6	Alkalinity, aluminum
Physical	6	Hardness
Risk to Public Health	1	No boil water advisory
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	4	
C. Operations		
Reservoir Cleanliness	0	Not inspected
Emergency Plan	10	No plan
Overall Ranking for Operations	9	Service disruption due to forcemain leak, re-occurring problem due to lime feeder broken
D. Reporting		
Ranking for Laboratories and Testing	2	Weekly by Health Canada and plant
Ranking for Boil Water Advisories	1	No boil water advisory
Overall Ranking for Reporting	2	

SECTION Water	SECTION RANKING Water	RISK Water
E. Operators		
Overall Ranking for Operators	9	No confidence and limited training
F. Statistical Data		
Overall Ranking for Individual Wells	0	
Overall Ranking for the System	6	Medium 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	No data available
B. Design		
Quality of Treated Effluent	0	
Ranking of Design of Sewage Plant	0	
Ranking of Concerns and Hazards within the Plant	0	
Condition of Laboratory Equipment	0	
Overall Ranking for Design	0	No data available
C. Operations		
Ranking for Emergency Plan	0	
Overall Ranking for Operations	0	No data available
D. Reporting		
Overall Ranking for Reporting	0	No data available
E. Operators		
Overall Ranking for Operators	7	No training or confidence
F. Statistical Data		
Overall Ranking for Individual Septic Tanks	0	
Overall Ranking for the Systems	N/A	No data available

5.0 Communal Water Supply (371 houses)

5.1 Water Source

The raw water is drawn from the Moose River.

5.2 Design

The Moose Cree community is serviced by a water treatment plant constructed in 1980. The treatment plant consists of one Ecodyne unit installed in 1980 and two newer Napier-Ried units installed in 1995. The treatment plant uses chlorine gas for disinfection other chemicals being used in the treatment process are; alum, lime and polymer. There are three water reservoirs, one above ground and two in-ground, with a total capacity of 96,000 gallons. The design capacity of the plant is not available however, the OCWA inspector was told that the plant runs at only 25 to 30% of its design capacity because of the dramatic decrease in water quality with higher output.

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

Date	Location	Exceedances	Result	GCDWQ limit
May 25, 2000	Treated Surface Water	Alkalinity	21 mg/L	30 to 500 mg/L (AO)
		Hardness	115 mg/L	80 to 100 mg/L (AO)
		Aluminum	0.35 mg/L	0.1 mg/L (OG)
Jun. 27, 2001	Treated Surface Water	Alkalinity	22 mg/L	30 to 500 mg/L (AO)
		Aluminum	0.172 mg/L	0.1 mg/L (OG)

AO = aesthetic objective, OG = operational guideline

The plant has a diesel-operated generator to supply backup power that is tested on a regular basis. There is adequate safety equipment at the plant, however, chlorine gas is a safety concern. The plant has a designated workshop area with appropriate tools for maintenance purposes.

There is an annual hydrant flushing and maintenance program in place, performed by the fire department. There is no annual main valve operating/maintenance program in place.

5.3 Operations

Chlorine gas is used for disinfection. There is a continuous on-line chlorine residual analyzer and the chlorine residual is also checked every two hours. Operations personnel report that the analyzer is calibrated every three months.

Operating and maintenance manuals for plant and equipment, as well as the as-built drawings, are available on site. Emergency repair parts are readily available and maintenance is performed on site.

In the last two years, one service disruption has been experienced due to a water leak. There is a re-occurring operational problem with the lime feeder and it was shut down at the time of the OCWA visit.

5.4 Reporting

Bacteriological sampling is sent out weekly for testing by plant staff. Health Canada conducts periodic testing. The results are kept on site.

The turbidity of the treated water is recorded using a continuous on-line turbidity meter. There is also an on-line pH meter. Health Canada conducts a chemical analysis of the treated water once per year.

The company that supplies the chemicals does raw water testing on a quarterly basis.

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

Period	Frequency	Regularity	Exceedances
99/10/15 to 2001/10/02	1 to 48 times per month from different locations	<ul style="list-style-type: none"> ▪ No months missing in 1999 ▪ No months missing in 2000 ▪ No months missing in 2001 	<ul style="list-style-type: none"> ▪ HPC exceedances were recorded on 2001/08/07, 2001/08/14, and 2001/08/31.

5.5 Operators

The water plant is located on the same site as a federal government-run hospital and steam plant. The Band is planning to take over the operation of the water plant in the summer of 2001.

The Moose Cree Band runs the sewage system.

Bill Carpenter, Bob Echum, Melvin Alisapi, Mike Dempsey, Lary Corston are the operators of the treatment plant.

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Two of the operators have taken courses on chlorine, however, all the operators need comprehensive training. There is an operator at the water plant 24 hours per day, therefore there is no backup personnel problem.

6.0 Deficiencies in the Community Water Supply

1. Safety equipment is available, however there is a concern over safety due to the use of chlorine gas.
2. There is no annual main valve operating/maintenance program in place.
3. There is no written contingency plan available.
4. One service disruption has been experienced due to a forcemain leak. Re-occurring operational problems are experienced with the lime feeder.
5. None of the operators are certified and require comprehensive training.

7.0 Communal Sewage Facilities (371 houses)

The OCWA visit took place a day after a snowstorm and, therefore, the OCWA representative could not meet with the operations staff of the sewage system and gather specific information for this report.

7.1 Effluent Receiver

No information was available.

7.2 Design

The sewage treatment system for the Moose Cree community consists of a collection system with four pumping stations and an aerated lagoon system. The aerated lagoon system consists of two aerated cells, and a third cell has recently been added. The lagoons discharge continuously.

7.3 Operations

The lagoon cells show evidence of plugged and/or broken air lines, as could be seen from the air bubble pattern. The blowers have been repaired.

Improvement in the air line is needed for proper operation of the aerated lagoons.

7.4 Reporting

No information was available on the sewage systems.

7.5 Operators

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Two of the operators have taken courses on chlorine, however, all the operators need comprehensive training. There is an operator at the water plant 24 hours per day, therefore there is no backup personnel problem.

8.0 Deficiencies in the Community Sewage Facilities

1. Due to a snowstorm, the operations personnel of the sewage system were not available to tour the sewage treatment facilities to complete the site visit.
1. The lagoons show evidence of plugged and/or broken air lines from the air bubble pattern.
2. Blowers have been repaired and have been kept running.
3. No information was available on sampling frequency.

9.0 Recommendations

- Investigate the use of sodium hypochlorite in lieu of chlorine gas.
- Investigate why the plant can only be run at 25-30% of its capacity, with water quality diminishing at higher output.
- Investigate operational problems with the lime feeder.
- Chlorine gas safety equipment and training is required.
- Implement a training program that can lead to certification of the operators.
- Develop a main valve operating and maintenance program.

- Develop a comprehensive contingency plan to address operational problems, breakdowns, vacations and sickness, main breaks and boil water advisories.
- Investigate possible problem with plugged and/or broken air line in the lagoon.
- Implement sewage effluent frequency testing.

10.0 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 these plants as follows:

Water Treatment Facility - Class II

Sewage Treatment Facility - Class I

11.0 Overall Community Risk Assessment

Water Category - Medium Risk

Medium Risk because of the following:

- Water plant capacity problems; and
- Operational problem with lime feeder.

Sewage Category - Not available due to insufficient information.

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