# Moravian of the Thames First Nation (Band No. 167)

**Date of Visit:** March 28, 2001
by M.J. Newland (OCWA)
**Site Address:** R.R. #3
Thamesville, ON N0P 2K0
**Phone No.:** 519-629-3936 **Fax No.:** 519-692-5522
**Tribal Council Affiliation:** Southern First Nations Secretariat
**Operator:** Calvin Jacobs
**Location:** The Moravian of the Thames community is located approximately 80 km southwest of London, along Hwy. 401 south from London and exit onto Hwy. 14 north
**Population:** 458 people in the community (October 2000 - INAC)
**No. of Units:** 145 housing units (CAIS)

## 1.0 Description of the Community Water Supply

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

- 73 people are serviced by a communal water system;
- 353 people are serviced by individual wells; and
- 32 people have no services.

- 23 houses are serviced by a communal water system;
- 112 houses are serviced by individual wells; and
- 10 houses have no services.

## 2.0 Description of the Community Sewage Facilities

Based on the CAIS report, sewage from the houses in the Moravian of the Thames community is treated as follows:

- 426 people are serviced by individual septic tanks; and
- 32 people have no services.

- 135 houses are serviced by septic tanks; and
- 10 houses have 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 | 5 | Slightly high turbidity |
| Physical | 5 | High hardness, sodium, total dissolved solids |
| Overall Ranking for Water Source | 7 | |
| **B. Design** | | |
| Biological | 1 | No exceedances |
| Chemical | 6 | Iron exceedance noted |
| Physical | 0 | No lab results available |
| Risk to Public Health | 1 | No boil water advisories |
| Condition of Laboratory Equipment | 0 | |
| Overall Ranking for Design | 3 | |
| **C. Operations** | | |
| Reservoir Cleanliness | 0 | |
| Emergency Plan | 0 | Not stated |
| Overall Ranking for Operations | 5 | Chlorine residual analyzer not calibrated, chemicals not properly stored, no hydrant maintenance |
| **D. Reporting** | | |
| Ranking for Laboratories and Testing | 1 | Health Canada conducts testing regularly |
| Ranking for Boil Water Advisories | 1 | No boil water advisory |
| Overall Ranking for Reporting | 1 | |

| SECTION Water | SECTION RANKING Water | RISK Water |
|---|---|---|
| **E. Operators** | | |
| Overall Ranking for Operators | 4 | Some training but no confidence |
| **F. Statistical Data** | | |
| Overall Ranking for Individual Wells | 0 | |
| Overall Ranking for the System | 4 | Low Risk |

# 4.0 Communal Water Treatment Supply (23 houses)

## 4.1 Water Source

The raw water is drawn from three groundwater wells.

The following table summarizes the raw water chemical exceedances available from Health Canada:

| Date | Exceedance | Result | GCDWQ Limit |
|---|---|---|---|
| June 2, 2000 | Conductivity | 1320 µs/cm | 800 µs/cm |
| | Hardness | 489 mg/L | 80 – 100 mg/L (OG) |
| | Turbidity | 1.14 NTU | 1.0 NTU |
| | Sodium | 137 mg/L* | 200 mg/L* (AO) |
| | Total Dissolved Solids | 852 mg/L | 500 mg/L (AO) |

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

## 4.2 Design

The Moravian of the Thames community is serviced by a water treatment plant constructed in 1996. The rated design capacity is 432 $m^3/d$. The present usage of the system is approximately 250 $m^3/d$. The raw water is drawn from three groundwater wells. No source water protection program is in place.

- Treated water results were not available from Health Canada.

The treatment plant consists of green sand filters, potassium permanganate and sodium hypochlorite. There is an off-site water reservoir tower with a capacity of 3,178 $m^3$. Sodium hypochlorite is used for disinfection, and potassium permanganate is added in the treatment process. The disinfection equipment is functional with sufficient chlorine available. Chemicals are not stored in accordance to MOE guidelines and the shelf life of the test reagents is unknown.

## 4.3 Operations

There is an on-line chlorine residual analyzer that has never been calibrated. Chlorine residual is manually checked once per day. The turbidity meter is not functioning correctly. There is a colilert unit available and the operator uses it. The results from chlorine residual and the colilert unit are not recorded.

There is no backup power generator for fire protection. There is adequate safety equipment at the plant with no other safety hazards or concerns with the facility. There are adequate laboratory and office areas, and insufficient ventilation for the plant and chemical storage areas. A workshop area is not available to perform maintenance.

There are operating and maintenance manuals for plant equipment and as-built drawings, but operating manuals for the treatment plant are not available on site. Emergency spare parts are not available. There is a contact list of technicians/trades people available. The response for such personnel is approximately one hour.

There is an annual hydrant flushing and main valve operating/maintenance program, but no maintenance program for the fire hydrants.

In the last two years, there have been no service disruptions and there are no re-occurring operational problems.

5.4 Reporting

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

| Period | Frequency | Regularity | Exceedances |
|---|---|---|---|
| 00/02/14 to 01/10/31 | Weekly | ▪ Testing conducted on a regular basis | ▪ No exceedances noted for the given period |

Last year, no boil water advisories had been issued on the communal water system. There have been no disease or health related outbreaks in the last two years.

The turbidity of the treated water is not recorded because the turbidity meter is not functioning properly. The operator reports that a chemical analysis of the treated water is conducted once per year however, Health Canada did not have any records. The operator noted that iron samples have exceeded the GCDWQ.

5.5 Operators

Calvin Jacobs is the only operator at the treatment plant.

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In the event that extended time off is required, these is no backup operator.

Additional training on chlorination, basic water, safety training in handling hazardous chemicals, and compounds are recommended.

## 6.0 Deficiencies in the Communal Water Supply

1. Meter calibration needs to be done and checks for distribution system leaks undertaken.
2. The water treatment plant does not have a backup power supply.
3. There are operating and maintenance manuals for plant equipment and as-built drawings, but no operating manuals for the plant on site.
4. This water treatment plant needs to be cleaned and organized. Good housekeeping of the plant needs to be practiced.
5. A maintenance program for fire hydrants needs to be implemented.
6. Record keeping needs improvement.
7. There is an on-line chlorine residual analyzer but it has never been calibrated. Chlorine residual tests are performed manually every day but results are not recorded.

8. A chemical analysis of the treated water is conducted once per year. It was found that iron has exceeded GCDWQ. Health Canada did not have any records of chemical analyses.

9. Turbidity readings are not taken because the turbidity meter is not functioning properly. There is a laboratory turbidity meter on site.

10. Chlorine residual and Colilert unit results are not recorded by the operator.

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11.

The operator has no backup personnel to fill in during vacations and sickness.

## 7.0 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 this plant as follows:

Water Treatment Facility- Class I

## 8.0 Recommendations - Action Required

- Move sodium hypochlorite system to a room equipped with an appropriate ventilation.
- Implement a training program that can lead to certification of the operator.
- Provide backup operator in case of sickness and vacation.
- Repair well that is out of service.
- Consider backup power for the water treatment plant.
- Repair SCADA system program.
- Review safety equipment that is available on site.
- Repair and calibrate on-line residual analyzer and turbidity meter.
- Record chlorine residual and colilert tests.
- Implement a house cleaning and general maintenance program at the facilities.
- Develop a comprehensive operating and maintenance program on the water distribution system to address hydrant maintenance.
- Develop a comprehensive contingency plan to address operational problems, breakdowns, vacations and sickness, and main breaks.
- Monitor chemical analyses exceeding Health Canada guidelines (iron) to ensure the process is adjusted to adequately treat the water supply.
- Implement a sewage septic tank inspection program to inspect all septic tanks in the community for proper operations and meeting the required standards.

## 9.0 Overall Community Risk Assessment

**Water Category – Low Risk**

**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.**