

Shoal Lake No. 40 First Nation (Band No. 155)

Date of Visit: March 20, 2001

By Peter Fox (OCWA) and Jodie Knibbs (Bimose)

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Tribal Council Affiliation: Bimose Tribal Council

Operator: Kevin Redsky

Location: The Shoal Lake No. 40 First Nation community is located on Indian Bay of Shoal Lake - 40 km west of Kenora along the Trans Canada Highway, and 22 km south on Shoal Lake Road. The channel is crossed in winter by ice road, and in the summer by barge

Population: 234 people in the community (November – INAC)

No. of Units: 78 houses (CAIS)

1.0 Description of the Community Water Supply

Based on the CAIS report, water to the houses in the community of Shoal Lake No. 40 is treated as follows:

- 234 people use piped water
- 78 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 within the Shoal Lake No. 40 community is treated as follows:

- 234 people use septic tanks
- 78 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.

| SECTION Water | SECTION RANKING Water | RISK Water |
|--------------------------------------|--------------------------|---|
| A. Water Source | | |
| Biological | 0 | No lab |
| Chemical | 0 | No lab |
| Physical | 0 | No lab |
| Overall Ranking for Water Source | 0 | |
| B. Design | | |
| Biological | 6 | 22 out of 55 exceedance (63%) |
| Chemical | 8 | Turbidity, manganese exceedance |
| Physical | 6 | High dissolved organic carbon |
| Risk to Public Health | 10 | High turbidity, permanent boil water advisory, no filtration |
| Condition of Laboratory Equipment | 0 | Not inspected |
| Overall Ranking for Design | 10 | |
| C. Operations | | |
| Reservoir Cleanliness | 0 | Not inspected |
| Emergency Plan | 0 | Unknown |
| Overall Ranking for Operations | 7 | No Chlorine residual analyzer, no operations and maintenance manuals, no turbidity monitoring |
| D. Reporting | | |
| Ranking for Laboratories and Testing | 2 | Monthly by Health Canada |
| Ranking for Boil Water Advisories | 10 | No filtration, almost permanent boil water advisory |

| SECTION Water | SECTION RANKING Water | RISK Water |
|--------------------------------------|----------------------------------|-----------------------|
| Overall Ranking for Reporting | 10 | |
| E. Operators | | |
| Overall Ranking for Operators | 4 | Confident |
| F. Statistical Data | | |
| Overall Ranking for Individual Wells | 0 | No data |
| Overall Ranking for the System | 10 | High Risk |

4.0 Communal Water Treatment Supply (78 houses)

4.1 Water Source

The raw water is drawn from the surface waters of Indian Bay.

4.2 Design

The Shoal Lake No. 40 community is comprised of many scattered pockets of housing. There are nine pumping stations to provide service to each of these pockets of houses. A separate system is available for the school.

The nine water pumping stations are basically identical. Only four were visited. Each pumping station has a submersible pump, and treatment process is limited to chlorination only. Each pumping station has one chlorine pump and day tank with two contact tanks to provide chlorine retention time for the raw water, and three to four pressure tanks to maintain water distribution system pressure. The chlorine solution day tanks have low level sensor switches to shut off the water pumps if the day tank is low. There is no alarm of any kind and they rely on operator visits to ensure pump houses are operational. This is difficult to maintain during spring (ice break up) and fall (freeze up).

The system was constructed in 1995, and appears to be in good condition. All pumping stations are clean except for the school system, which is operated by the janitorial staff.

The school system has two suction pumps (which had to be recently replaced), a chlorine pump, three mixing tanks, and two storage tanks for the treated water. Two pumps provide system pressure. There is also a fire pump. All these are located on grade in a single building. Piping layout, while functional, was difficult to access.

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

| Date | Location | Exceedances | Result | GCDWQ |
|---------------------|------------------|-----------------------------|-----------|------------------|
| Jul. 7, 1998 | Health Clinic | Turbidity | 1.4 NTU | 1.0 NTU (HL) |
| | | Dissolved organic Carbon | 8.0 mg/L | 5.0 mg/L (AO) |
| | | Manganese | 0.07 mg/L | 0.05 mg/L |
| Oct. 20, 1999 | Band Office | Dissolved Organic Carbon | 12 mg/L | 5.0 mg/L (AO) |
| | | Colour | 14 TCU | 15 TCU (AO) |

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

There is no safety equipment available on site, but no safety hazards or safety concerns were observed with the facilities, with the exception of the need for eyewash stations.

All building structures housing the equipment were functional for their intended use, but no provision have been made for any laboratory, office/filing and/or workshop areas.

Ventilation is adequate but there is no diesel backup.

4.3 Operations

There is no on-line continuous metering equipment (chlorine residual and turbidity) at any of the facilities. Sodium hypochlorite (12%) is used for disinfection. There is one, apparently new, full 20 litre container of sodium hypochlorite at each pumping station site, but no sign of any additional supplies.

There are no spare parts available on site, but supply is available in a short time from Kenora or Winnipeg. Local technician and tradesmen are available within a few hours. As-built drawings and operation and maintenance manuals were reported to be available at the band office.

On the water distribution systems, the operator has an annual flushing program. The distribution system is intended for domestic use only with 50 mm diameter, insulated, shallow-buried lines being the norm.

4.4 Reporting

The operator of the water pumping stations has only recently taken over this position in conjunction with other responsibilities. There are no written records of any chlorine residual testing and the chlorine comparator was outmoded. The band office had requested numerous written status reports from the operator but the operator claims he is too busy with all his other responsibilities to complete them. He was installing a new water distribution line at the time of the visit.

Health Canada takes regular bacteriological tests, and submits to the Thunder Bay laboratory. The results continually show bacterial presence requiring a boil water advisory. A boil water advisory was in place for the community at the time of the OCWA visit. Sample results are reportedly kept at the Administration Office. Chemical analyses sampling are conducted yearly by Health Canada.

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

| Period | Frequency | Regularity | Exceedances |
|------------------------------|--|---|---|
| Feb. 2/2000 to Sept. 25/2001 | 2 – 9 times/month from different locations | <ul style="list-style-type: none"> ▪ 7 months missing in 2000 ▪ 32 months missing in 2001 | <ul style="list-style-type: none"> ▪ A total of 22 out of 35 (63%) total coliform/E.Coli exceedances |

The water source is known to have cysts, which are not eliminated by disinfection alone. We have not been told if they have been detected in this community, but the City of Winnipeg draws from the same source and occasionally has boil advisories due to the presence of cysts.

4.5 Operators

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The operator of the water pumping stations is Kevin Redsky. [REDACTED]

[REDACTED] here does not appear to be any backup operator, and Kevin has other duties in addition to the water system.

5.0 Deficiencies in the Communal Water Supply

1. The nine water pumping stations are basically identical. Only four were visited. Each has a submersible pump. Water treatment process is limited to chlorination only.
2. The chlorine solution day tanks have low level sensor switches to shut off the water pumps if the day tank is low. There is no alarm of any kind and they rely on operator visits to ensure pump houses are operational.
3. All stations are clean and neat except for the school system.
4. There is no on-line continuous monitoring equipment at any of the facilities.
5. There is no safety equipment available on site, however, there were no safety hazards or safety concerns observed with the facilities with the possible exception of the need for eyewash stations.
6. All building structures housing the equipment were functional for their intended use but no provision had been made for any laboratory, office/filing and/or workshop areas.
7. The water pumping stations do not have any diesel backup.
8. There were no spare parts available on site but supply is available in a short period of time from Kenora or Winnipeg. Local technician and tradesmen are available within a few hours.
9. The operator has confidence in his abilities but he would like more training. He is not certified.
10. The operator is new to the system, has duties besides the water system and has no backup.
11. There is virtually no record keeping on site and we are unaware that the operator does any testing.
12. Health Canada takes bacteriological samples monthly and chemical samples annually. Total coliform and/or E.Coli exceedance are frequent.

6.0 Recommendations

- Implement a training program that can lead to certification of the operator
- Purchase a spare chlorine pump as backup.
- Each water pumping station should have a supply of sodium hypochlorite sufficient to last during seasonal ice change over conditions when ice or water travel is impossible.
- Include chlorine residuals in regular water sampling program for distribution system and pumping station.
- Implement regular record keeping.
- Develop a contingency plan in case of emergencies for the complete water supply system.
- Consider a portable backup generator for the water pumping stations to keep the facilities in service during prolonged power blackouts.
- Investigate the presence of cysts in water source, and develop a plan to provide a safe filtered water supply.
- Consider installing filtration at pump houses.
- Investigate source of contamination leading to the present boil water advisory.
- 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:**
 - Constant boil water advisory; and
 - No filtration to remove parasites not affected by chlorine.

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.