Fort Severn First Nation (Band No. 89)

Date of Visit: March 13, 2001
Cam McIvor (OCWA)
Site Address: General Delivery
Fort Severn, ON P0V 1W0
Phone No.: 807-407-2572 **Fax No.:** 807-478-1103
Tribal Council Affiliation: Keewaytinook Okimakanak Tribal Council (KOTC)
Operator: David Matthews
Location: The Fort Severn community is located 850 km north of Thunder Bay (accessible by air).
Population: 434 people in the community (November 2000 - INAC)
No. of Units: 102 housing units (CAIS)

1.0 Description of the Community Water Supply

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

- 294 people use piped water
- 140 people have holding tanks with trucked water

- 69 houses are serviced by a communal water system; and
- 33 houses are serviced by water holding tanks and trucked water.

2.0 Description of the Community Sewage Facilities

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

- 408 people have holding tanks with trucked haulage
- 26 people have no services

- 96 houses are serviced by holding tanks with haulage by septic truck to a lagoon; and
- 6 houses have no service.

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 available
Chemical	1	No exceedances
Physical	5	High color, total organic carbon
Overall Ranking for Water Source	5	
B. Design		
Biological	1	Insufficient data available
Chemical	1	No exceedances
Physical	5	High color, total organic carbon
Risk to Public Health	8	Boil water advisory due to low chlorine and positive colilert tests, turbidity problems noted by Health Canada.
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	5	
C. Operations		
Reservoir Cleanliness	0	Not inspected
Emergency Plan	0	Unknown
Overall Ranking for Operations	5	No hydrant maintenance or flushing program.
D. Reporting		
Ranking for Laboratories and Testing	2	Monthly by operator

SECTION Water	SECTION RANKING Water	RISK Water
Ranking for Boil Water Advisories	8	One boil water advisory due to low chlorine levels, positive colilert; problem was being addressed
Overall Ranking for Reporting	6	
E. Operators		
Overall Ranking for Operators	2	Operator certified to Class I
F. Statistical Data		
Overall Ranking for Individual Wells	0	No data available
Overall Ranking for the System	5	Medium Risk*

*System is expected to be ranked as low risk, once the new water treatment facility is complete in October 2002.

4.0 Communal Water Treatment Supply (69 houses)

4.1 Water Source

The surface water supply is from the Severn River.

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

Sample Date	Sample Received	Location	Exceedances	Result	GCDWQ limit	Notes
Feb. 9, 2001	Feb. 12, 2001	Raw Water	Colour	46 TCU	15 TCU (AO)	The sample was expired for turbidity and pH upon receipt
			Total Organic Carbon	14.0 mg/L	5.0 mg/L (AO)	
			Hardness	112 mg/L	80 to 100 mg/L (OG)	

AO = aesthetic objective, OG = operational guideline

4.2 Design

The Fort Severn community is serviced by a water treatment plant, which was constructed in 1989, with a rated capacity of 2 gal/min. The water treatment plant is approaching its capacity limit. The existing treatment plant consists of pressure filters followed by the addition of sodium hypochlorite for disinfection. Raw water is fed to the plant from a 17,500 m^3 raw water reservoir. The reservoir is filled every 3 months by pumping in water from the Severn River using a portable pump. Color is very high in the Severn River.

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

Sample Date	Sample Receive	Location	Exceedances	Result	GCDWQ limit	Notes
Feb. 9, 2001	Feb. 12, 2001	Water Plant	Colour	46 TCU	15 TCU (AO)	The sample was expired for turbidity and pH upon receipt
			Dissolved Organic Carbon	6.4 mg/L	5.0 mg/L (AO)	
			Hardness	116 mg/L	80 to 100 mg/L (OG)	
Jul. 9, 2001	Jul. 13, 2001	Distribution System	Colour	19 TCU	15 TCU (AO)	Results were not available for sulphide because it was not the sample was not placed in a properly preserved bottle
			Dissolved Organic Carbon	6.4 mg/L	5.0 mg/L (AO)	
			Hardness	56 mg/L	80 to 100 mg/L (OG)	

AO = aesthetic objective, OG = operational guideline

There is a back up power generator for fire protection at the water treatment plant. There is adequate safety equipment at the plant with no other safety hazards or concerns with the facility. There is an inadequate laboratory and office area but there is sufficient ventilation for the plant and chemical storage area. A workshop area is not available to perform maintenance.

OCWA staff was informed that a water treatment system consisting of a slow sand filter is to be constructed by October 2002.

4.3 Operations

The disinfection equipment is functional with sufficient chlorine available. The chemicals are not stored in accordance with MOE guidelines and the shelf life of the test reagents is unknown.

There is no on-line chlorine residual analyzer but the chlorine residual is manually checked once per day. There is a colilert unit available and the operator uses it. The results from chlorine residual and the colilert unit are recorded.

There are operation and maintenance manuals for plant equipment and as-built drawings on site. Emergency spare parts are available. There is a contact listing of technicians/trades people available. The response for such personnel is approximately 24 hours.

There is a main valve maintenance on flushing program.

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

There is no annual hydrant flushing and main valve operating and maintenance program.

4.4 Reporting

The operator performs regular bacteriological tests monthly on the system. David Matthews, is in charge of keeping the results at his desk. No samples are sent off site for lab testing. Chlorine residual and turbidity are tested daily.

Health Canada performs an annual chemical analysis of the treated water.

Health Canada supplied the following boil water advisory information:
- Boil water advisory issued in July 2001 because of low chlorine levels in system and positive colilerts. The boil water advisory was extended due to routine water plant procedure complications with the reservoir fill line.
- The recommended remedial measure for the boil water advisory was to fill the reservoir to supply the system and maintain the chlorine residual at proper levels. Clean out water tanks and continue to monitor bacterial quality of the water.
- After undertaking the above recommended remedial measure, Health Canada noted that the system was still having problems with turbidity and chlorine residual levels. New filter media was to be added.

The following colilert test results were available from Health Canada:

Date	Result
February 2001	Two satisfactory samples

The following chlorine residual data was available from Health Canada:

Date	Result
February 2001	Two results showed trace chlorine residual levels

4.5 Operators

David Matthews is the operator of both sewage and water facilities. He has received some training when both plants were built in 1989. David is certified for water treatment Class I but not certified for sewage. He is very knowledgeable and has a good understanding of disinfection and chlorination. He would like to upgrade his certification. Paul Matthews is a back up when David is unable to work. Paul has had some training on the job.

5.0 Deficiencies in the Communal Water Supply

1. The plant was built in 1989 and is reaching its capacity. A new water treatment facility is to be constructed by October 2002.

2. There is inadequate storage/office/lab area within the plant.

3. There is no hydrant flushing or maintenance program.

4. There has been a service disruption due to lack of water in the reservoir.

5. There is no on-line chlorine residual analyzer but residual is checked every day with a test kit.

6. Turbidity readings are taken manually, as there is no on-line turbidity meter.

7. There was a boil water advisory issued on the communal water system in the past two years, but no diseases on health related outbreaks in the last two years.

8. Colour and dissolved organic carbon has exceeded the GCDWQ in treated water samples.

9. The operator is certified to Level I for water, but not for sewage. Operator wishes to upgrade his certification for all facilities. The back up operator has some on-the-job training – he fills in during vacations and sickness.

10. A maintenance management program should be initiated.

11. Bacteriological samples should be taken more often than the current practice.

12. The proposed new treatment facility should lower colour and turbidity results.

6.0 Individual Holding Tanks with Trucked Sewage and Lagoon (96 houses)

6.1 Effluent Receiver

This type of system does not require discharge to a surface water body as the water percolates through the bottom of the cell into the ground.

6.2 Design

The individual holding tanks have septic waste trucked to an exfiltration lagoon system. The berms are in good shaped and the berm is rubber lined.

The OCWA inspector did not actually visit this facility on the day of inspection because of the weather and lack of transportation. He did discuss this facility with the operator, David Matthews.

6.3 Operations

The OCWA inspector did not actually visit this facility on the day of inspection because of the weather and lack of transportation. He did discuss this facility with the operator, David Matthews.

The lagoon plant has been vandalized on several occasions even though there is a fence surrounding it; security needs to be addressed. Anyone entering the lagoon area must be aware of the liner within the lagoon, since they could unknowingly slip in the lagoon.

6.4 Reporting

No effluent tests are conducted. (Effluent percolates into the ground so there is no discharge to surface water).

6.5 Operators

David Matthews is the operator of both sewage and water facilities. He has received some training when both plants were built in 1989. David is certified for water treatment Class I but not certified for sewage. He is very knowledgeable and has a good understanding of disinfection and chlorination. He would like to upgrade his certification. Paul Matthews is a back up when David is unable to work. Paul has had some training on the job.

7.0 Deficiencies in the Communal Sewage Treatment Facilities

1. Implement a security plan to minimize vandalism.

8.0 Recommendations

- Review water-sampling procedures.
- Implement an annual main valve maintenance program.
- Consider construction of an office and laboratory.
- Implement a training program that can lead to certification of the operator.
- Install an on-line turbidity meter and chlorine residual analyzer.
- Develop a comprehensive contingency plan to address operational problems, breakdowns, vacations and sickness, and main breaks.
- Address exceedances in colour and turbidity test results. (This will be addressed with new filtration system).
- Implement a volume reporting system for volume of septage discharged to lagoon.
- Review safety equipment that is available on site.
- Review security procedures for the lagoon site to prevent unauthorized entry.

9.0 Plant Classification

Based upon the Terms of Reference – Appendix I – Plant Classification Guideline developed by Public Works Canada and with discussions with the Ontario Ministry of the Environment Classification Group, OCWA classified this plant as follows:

Water Treatment Facility - Class II

10.0 Overall Community Risk Assessment

Water Category – Medium Risk (assuming new filtration system is constructed by October 2002).

- **Medium Risk because of the following:**
  - Boil water advisory due to low chlorine residual and positive colilert; and
  - Turbidity problems.

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