Chippewas of Beausoleil (Christian Island) First Nation (Band No. 141)

Date of Visit: April 10, 2001
By George Culhane (OCWA)
Site Address: I.R. #30, Christian Island
Cedar Point Post
Penetanguishene, ON L0K 1P0
Phone No.: 705-247-2051 **Fax No.:** 705-247-2239
Tribal Council Affiliation: Ogemawahj Tribal Council (OTC)
Operators: Richard Monague, Dale Monague
Location: The Chippewas of Beausoleil First Nation community is located on three islands in Georgian Bay, and on the mainland on Part Lot 20, Concession 21, Township of Tiny, approximately 30 km northwest of Midland. It is accessible by ferry from Cedar Point. No residents live on Beckwith Island, Hope Island, Chippewa Island, or The Watchers
Population: 617 people in the community (November 2000 - INAC)
No. of Units: 201 housing units (CAIS)

1.0 Description of the Community Water Supply

Based on the CAIS report, water to the houses in the Christian Island and Cedar Point communities is treated as follows:

- 574 people are serviced by a communal surface water system on Christian Island; and
- 43 people are serviced by a communal groundwater well system at Cedar Point.

- 187 houses are serviced by a communal surface water system on Christian Island; and
- 14 houses are serviced by a communal groundwater well system at Cedar Point.

2.0 Description of the Community Sewage Supply

Based on the information supplied to OCWA, sewage from the houses in the Chippewas of Beausoleil community is treated as follows:

- 574 people are serviced by individual septic tanks Christian Island; and
- 43 people are not identified in CAIS (Cedar Point)

- 187 houses are serviced by individual septic tanks Christian Island; and
- 14 systems are not identified in CAIS (Cedar Point).

3.0 Overall Assessment for Communal Water Treatment Supply

3.1 Christian Island

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	6	High aluminum, iron
Physical	1	
Overall Ranking for Water Source	5	
B. Design		
Biological	2	17 exceedances of total coliform out of 696 samples (2.4%)
Chemical	1	
Physical	4	DOC exceedance
Risk to Public Health	4	
Condition of Laboratory Equipment	0	
Overall Ranking for Design	3	
C. Operations		
Reservoir Cleanliness	0	
Emergency Plan	0	
Overall Ranking for Operations	5	No emergency spare parts available on-site
D. Reporting		
Ranking for Laboratories and Testing	2	Regular bacteriological tests conducted
Ranking for Boil Water Advisories	1	No boil water advisories

SECTION Water	SECTION RANKING Water	RISK Water
Overall Ranking for Reporting	2	Meeting GCDWQ
E. Operators		
Overall Ranking for Operators	2	Have received training and appear confident
F. Statistical Data		
Overall Ranking for Individual Wells	0	
Overall Ranking for the System	5	Medium Risk

3.2 Cedar Point

The well has been replaced and the upper Pumphouse has been repaired.

SECTION Water	SECTION RANKING Water	RISK Water
A. Water Source		
Biological	0	
Chemical	3	
Physical	3	
Overall Ranking for Water Source	3	
B. Design		
Biological	3	
Chemical	3	
Physical	3	
Risk to Public Health	3	
Condition of Laboratory Equipment	0	
Overall Ranking for Design	3	
C. Operations		
Reservoir Cleanliness	0	
Emergency Plan	0	
Overall Ranking for Operations	2	Disinfection equipment repaired
D. Reporting		
Ranking for Laboratories and Testing	2	Regular testing conducted
Ranking for Boil Water Advisories	1	Boil Water Advisory removed in 2002
Overall Ranking for Reporting	2	
E. Operators		
Overall Ranking for Operators	2	Have received training and appear confident
F. Statistical Data		
Overall Ranking for Individual Wells	0	
Overall Ranking for the System	3	Low Risk (originally High Risk)

4.0 Communal Water Supply - Christian Island (187 houses)

4.1 Water Source

The raw water is pumped from Georgian Bay.

The following table summarizes all available raw water exceedance data from Health Canada:

Data	Exceedances	Result	GCDWQ Limit
Nov. 15, 2000	No Exceedances		
May 22, 2001	No Exceedances		
Sept. 19, 2001	Aluminum	0.204 mg/L	0.1 mg/L (OG)
	Iron	0.36 mg/L	0.30 mg/L (AO)

AO = aesthetic objective, OG = operational guideline

4.2 Design

The water treatment plant for Christian Island consists of a Zenon membrane package system classified on March 1, 2001 with Class II Water Treatment System (Certificate #3016). The system also consists of chlorination, an on-site in-ground water reservoir, and a water distribution system. The rated design is 925 m^3/day and does not meet peak day demand. The raw water is pumped from Georgian Bay to a dual train membrane water treatment process. Three variable speed pumps are used to supply and pressurize the distribution system with the treated water contained in the reservoir. The reservoir was constructed below ground in 1999 and has a capacity of 620 m^3.

The following table summarizes all available exceedance data for treated water that is available from Health Canada:

Date	Exceedances	Result	GCDWQ Limit
Feb. 4, 2000	Dissolved Organic Carbon	22.8 mg/L	5.0 mg/L (AO)
Nov. 15, 2000	No Exceedances		
May 22, 2001	No Exceedances		
Sept. 19, 2001	No Exceedances		

AO = aesthetic objective

A diesel operated pump is used for fire protection and a diesel-operated generator is used to supply backup power for the plant. Both the pump and the generator are being tested on a regular basis.

There is adequate ventilation for the plant and chemical storage area. Safety equipment is on-site. The laboratory and office/filing area within the plant are also sufficient. Appropriate tools and workshop area are available to perform maintenance. Additional safety equipment is on back order. A gas detector may be required.

4.3 Operations

Sodium hypochlorite (12%) is used for disinfection and the equipment is functioning properly with sufficient hypochlorite available. Chlorine residual is manually checked daily along with the on-line chlorine residual analyzer. The on-line residual analyzer is calibrated monthly. No other chemicals are used in the process. The chemicals are stored in accordance with MOE guidelines with sufficient test reagents.

A colilert unit and incubator are at the plant and are used by the plant operators. Samples are submitted on a monthly basis to off-site labs for bacteriological testing.

There are operating and maintenance manuals for plant equipment, and as-built drawings. A contact listing of technicians and trades people is readily available on-site. Emergency spare parts are not readily available and the average response time of technicians is about a day.

An annual hydrant and distribution system-flushing program is in place where 80 hydrants are flushed in spring and fall. A main valve maintenance program has not been implemented.

In the last two years, service disruptions have been experienced due to Zenon equipment failures, all of which have been rectified including a Zenon control switch that would fail in the clear well.

4.4 Reporting

The plant operators perform bacteriological tests on the communal water systems once a week. The results are recorded and kept at the plant and reported to Health Canada.

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

Period	Frequency	Regularity	Total Coliform Exceedances
99/12/13 to 01/10/10	2 – 5 times per month	▪ No months missing	▪ 99/12/13 – Residence ▪ 00/01/05 – Residence ▪ 00/05/09 – Christian Island School ▪ 00/05/10 – School resample ▪ 00/05/10 – School resample ▪ 00/05/10 – School resample ▪ 00/05/30 – Christian Island School ▪ 00/06/01 – School resample ▪ 00/06/02 – School: Staff room ▪ 00/06/12 – Residence ▪ 00/06/12 – Christian Island School ▪ 00/06/13 – School resample ▪ 00/06/13 – School resample ▪ 00/06/27 – Christian Island School ▪ 00/07/10 – Administration Building ▪ 00/09/18 – Christian Island School ▪ 01/09/24 – Residence

In the last two years, there have not been any disease or other health related outbreaks.

The turbidity of the treated water is recorded on-line at the Christian Island water treatment plant. A chemical analysis of the treated water is conducted twice per year.

4.5 Operators

s.19(1)

The operators at the water treatment plant are Richard Monague and Dale Monague.

and from Zenon at the Collingwood Water Treatment Plant. Both operators were familiar with calibrating and maintaining the disinfection equipment and they appear to be confident in their operational techniques.

The second operator is the backup operator to cover for vacation or sickness.

5.0 Communal Water Supply - Cedar Point (14 houses)

No site visit was made to Cedar Point. Information and recommendations made here on the Cedar Point water facility is supplemented with information obtained from the report entitled "Chippewas of Beausoleil First Nation – Cedar Point Community Water System Review" by Michael T. Emms, C.E.T., WD2.

Based on the information supplied by Mr. Keith Maracle, Ogemawahj Tribal Council, dated February 18, 2003, in 2002 a number of changes have occurred in the Cedar Point system. In the Lower Pumphouse the well has essentially been shut down, and in the Upper Pumphouse the well has run dry and is no longer being used. A third well has since been installed and is supplying water to the distribution system via the Upper Pumphouse. A temporary UV disinfection system has been installed at the Upper Pumphouse.

As of February 18, 2003, the Health Canada Boil Water Advisory has been lifted. The existing system is considered temporary only.

5.1 Water Source

The raw groundwater source is from two unscreened drilled wells. The two wells have now been replaced with a third well via the Upper Pumphouse.

5.2 Design

The Cedar Point community is serviced by a water supply and treatment system that was constructed in 1978 and later expanded in 1989. The groundwater source was originally serviced by two unscreened drilled wells. In 2002, the two unscreened drilled wells have been replaced with one well using the Upper Pumphouse. The untreated facility now consists of one pump house, pressure tanks, a reservoir and high lift pumps distributing water to the community. The rated design capacity of the Upper Pumphouse is 43.75 L/min.

5.3 Operations

Sodium hypochlorite is used for disinfection, however the chlorinating equipment is not continuously functional.

The Lower Pumphouse has never been taken out of service. The Upper Pumphouse well has been replaced and water is treated by the Upper Pumphouse treatment system.

5.4 Reporting

The plant operators perform bacteriological tests on the communal water systems once a week. The results are recorded and kept at the plant and reported to Health Canada.

The Cedar Point community boil water advisory issued by Health Canada was removed in 2002, after the new well was installed.

5. 5 Operators

s.19(1)

The operators at the water treatment plant are Richard Monague and Dale Monague. Both operators were familiar with calibrating and maintaining the disinfection equipment a
The second operator is the backup operator to cover for vacation or sickness.

6.0 Deficiencies in the Communal Water Supply

6.1 Christian Island

1. Emergency spare parts are not readily available and the average response time of technicians is about a day.

2. In the last two years, service disruptions have been experienced due to Zenon equipment failures most of which have been rectified.

3. Re-occurring operational problems include the Zenon control switch.

4. The operators are not certified but are trained to operate and maintain the facility.

5. Total coliform exceedances in the distribution system may indicate that chlorine residual needs to be closely monitored.

6.2 Cedar Point

1. Repairs in 2002 have addressed all deficiencies.

7.0 Classifications

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 – Christian Island	Class II
Water Treatment Facility – Cedar Point	Class I

8.0 Recommendations

- Purchase spare parts as required.
- Implement a Training Program that can lead to certification of all the operators.
- Develop of a comprehensive contingency plan to address operational problems, breakdowns, watermain breaks and boil water advisories.
- Implement continuous on line chlorine disinfection.
- Closely monitor chlorine residual in distribution system.
- 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 - Medium Risk for Christian Island

- **Medium Risk for Christian Island because of the following:**
  - Total coliform exceedances in distribution system may indicate low chlorine residuals.
  - Failing of plant control switch.

Water Category – Low Risk (was originally High Risk) for Cedar Point

- **Low Risk for Cedar Point because of the following:**
  - Boil Water Advisory was removed when new well was installed and Upper Pumphouse improved in 2002.

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.