

Nairn Centre Water Treatment

Large Municipal Residential Drinking Water System

January 1, 2018 – December 31, 2018

***Reg 170/03 Schedule 22 Summary Report
Reg 170/03 Section 11 Annual Report
&
Reg 387/04 Annual Record of Water Taking***

Prepared by the Ontario Clean Water Agency
For The Corporation of the Township of Nairn and Hyman



**Ontario Clean Water Agency
Agence Ontarienne Des Eaux**



Drinking-Water System Number: 210002138
Drinking-Water System Name: Nairn Centre Drinking Water System
Drinking-Water System Owner: The Corp. of the Township of Nairn and Hyman
Drinking-Water System Category: Large Municipal Residential

SECTION 1: INTRODUCTION

This document is prepared in accordance with Section 11 and Schedule 22 of O.Reg.170/03 under the Safe Drinking Water Act and with Section 9 of O.Reg.387/04 under the Ontario Water Resources Act. The reports are prepared by the Ontario Clean Water Agency. Acronyms and definitions can be found at the end of the report.

A copy of the Summary Report must be provided to the members of the municipal council by March 31, 2019.

SECTION 2: REQUIREMENTS OF THE REPORTS

Schedule 22 Report

The report must list the requirements of the Act, the regulations, the system's approval and any order that the system **failed to meet** at any time during the period covered by the report. It must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

For the purpose of enabling the owner of the system to assess the rated capability of their system to meet existing and future planned water uses, the following information is required to be included in this report:

- A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.
- A comparison of the summary to the rated capacity and flow rates approved in the systems approval.

Section 11 Report

The annual report must contain the following:

- A brief description of the drinking water system and a list of chemicals used by the system.
- A description of any major expenses incurred during the period covered by the report to install, repair or replace required equipment.
- A summary of all adverse water quality incidents (AWQI) reported to the Ministry
- A summary of corrective actions taken in response all AWQIs
- A summary of all test results required under the regulation, under an approval, municipal drinking water licence or order, including an OWRA order.
- A statement of where a Schedule 22 report will be available for inspection.

The report must be prepared not later than February 28 of the following year.

Regulation 387 Report

On or before March 31 in every year, every holder of a permit to take water (PTTW) shall submit to a Director the data collected and recorded for the previous year.

A record of annual water taking can be found in [Appendix A](#).



SECTION 3: SCHEDULE 22 REPORT

Flows - Treated

In accordance with the Municipal Drinking Water License (MDWL), the Nairn Centre WTP shall not be operated to exceed a maximum flow of 818 m³/d to the distribution system.

The daily treated water maximum flow was 297.5 m³ in June and represents 36.4% of capacity.

The quantity of treated water supplied during the reporting period **did not** exceed the rated maximum capacity.

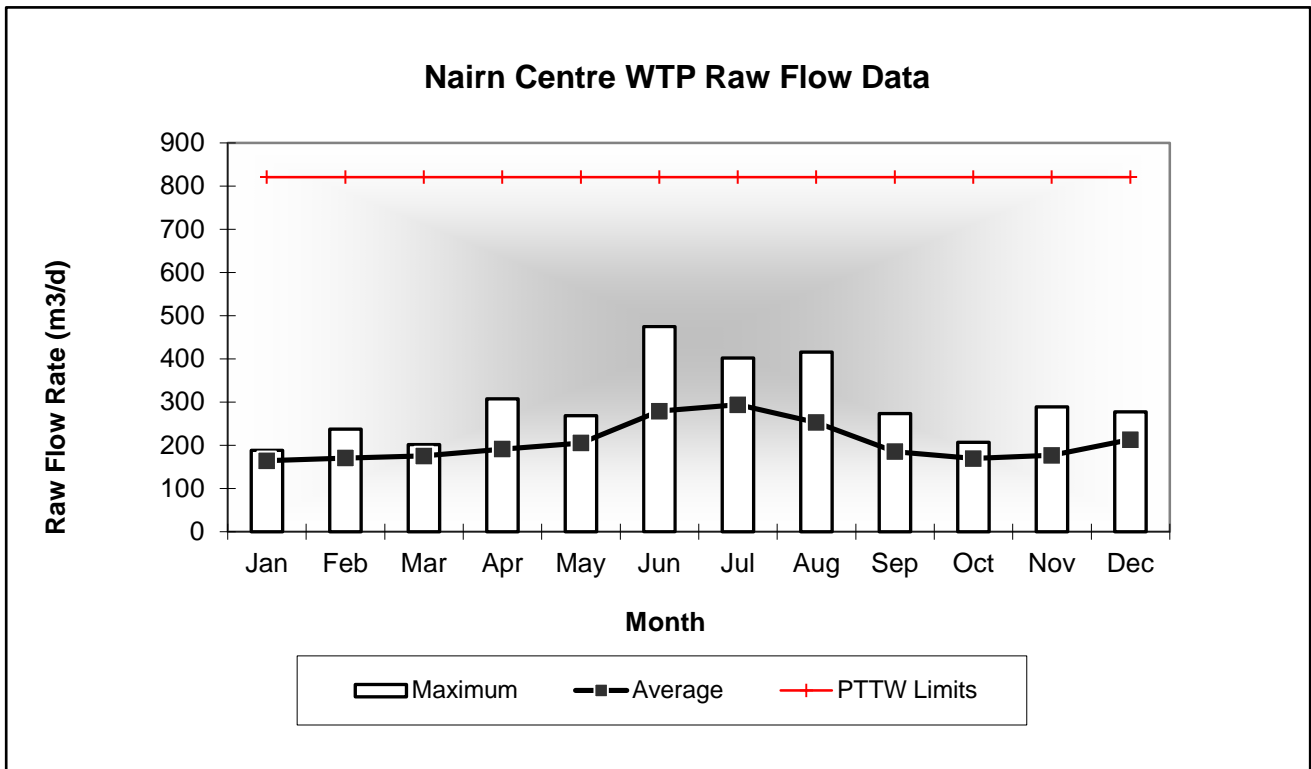
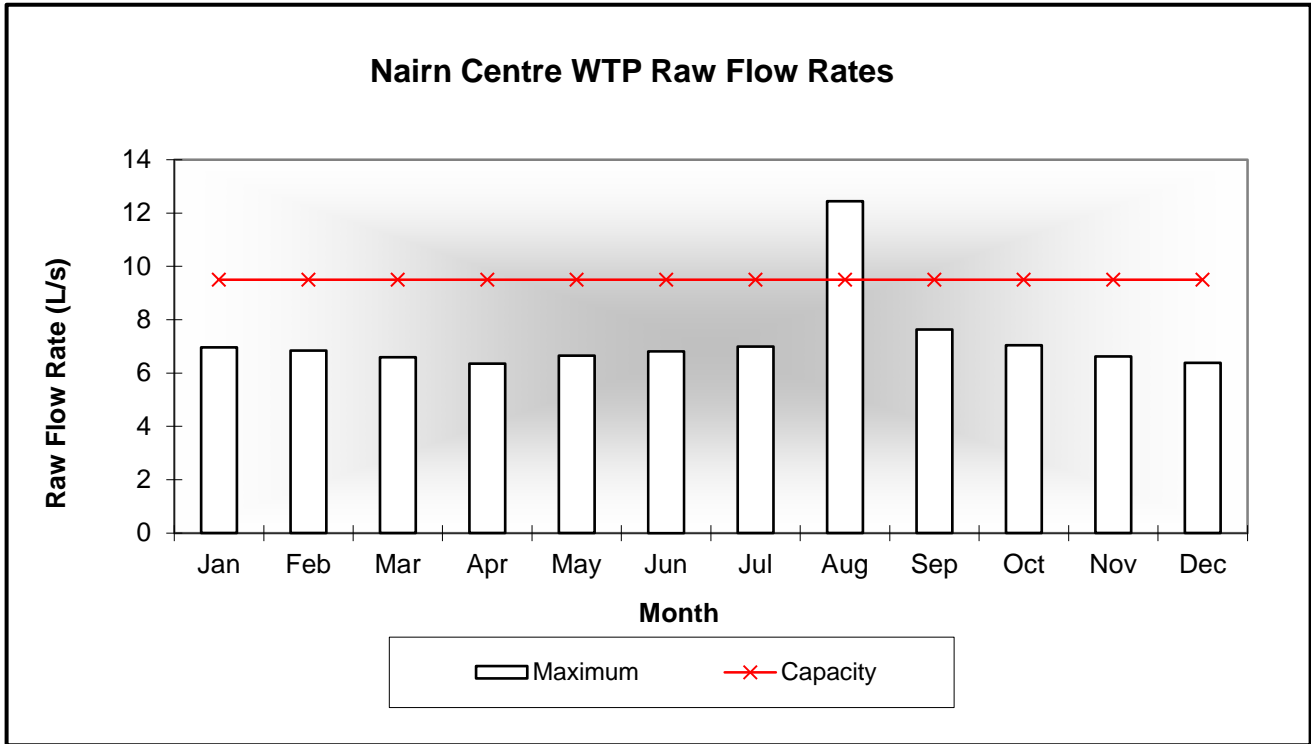
Flows - Raw

Daily raw maximum instantaneous flow is stated in the PTTW at a maximum rate of flow of 9.5 L/s and a maximum daily volume of 820.8 m³/d.

The average monthly raw water flow for this reporting period was 206.45 m³/d. The maximum daily flow was 474.3 m³/d representing 57.8% of water taking limits.

The quantity of raw water taken **did not** exceed the m³/d limits stipulated within the PTTW. The l/sec flow rates **did** exceed the limit. This occurred when the low lift pump was plugged. The operators had opened the flow control valve in an attempt to increase flows but this did not work. They then found the issue with the pump and unclogged it. They forgot to adjust the flow control valve before turning the pump on again.

<i>RAW WATER FLOW DATA - TOTAL ALL SOURCES</i>						
Month	Total Monthly Flow (m ³)	Average Flow (m ³ /d)	Maximum Flow (m ³ /d)	Maximum Flow Rate (L/s)	Limits	
					L/s (PTTW)	m ³ /d (PTTW)
January	5,086.5	164.08	188.5	6.96	9.5	820.8
February	4,767.7	170.28	237.6	6.84	9.5	820.8
March	5,424.8	175	201.8	6.59	9.5	820.8
April	5,735	191.17	307.7	6.35	9.5	820.8
May	6,361.9	205.22	268.7	6.65	9.5	820.8
June	8,361.1	278.7	474.3	6.81	9.5	820.8
July	9,100.9	293.58	402.2	6.99	9.5	820.8
August	7,824.9	252.42	415.9	12.44	9.5	820.8
September	5,554.9	185.16	273.6	7.63	9.5	820.8
October	5,242.6	169.12	207.1	7.04	9.5	820.8
November	5,295.3	176.51	289.1	6.62	9.5	820.8
December	6,599.9	212.9	277.6	6.38	9.5	820.8
Total	75,355.6					
Average		206.45				
Maximum			474.3	12.44		





Annual Raw Water Review

Raw Water Taking	Total Taking m3/d	Average Day m3/d	Max Day m3/d	Max Day % of PTTW allowable 820.8 m3/d
2018	75,355	206.45	474.3	57.8%
2017	72,612	198.94	665.8	81%
2016	80,787	221	484	59%
2015	72,001	198	486	59%

System Failures and Corrective Actions

The latest inspection of the drinking water facility took place on **November 6, 2018**. The facility scored **0/493** providing a rating of **100%**.

AWQIs reported to the Ministry					
Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
N/A	N/A	N/A	N/A	N/A	N/A

SECTION 4: SECTION 11 REPORT

Information to be provided

Population Served	477 (Stats Canada – 2011)
Does your Drinking-Water System serve more than 10,000 people?	No
Is your annual report available to the public at no charge on a web site on the Internet?	Yes
Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.	Township of Nairn and Hyman, Municipal Office 64 McIntyre Street Nairn Centre, Ontario P0M 2L0
Number of Designated Facilities served:	0
Did you provide a copy of your annual report to all Designated Facilities you serve?	NA
Number of Interested Authorities you report to:	0
Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?	NA
List all Drinking-Water Systems (if any), and their DWS Number which receive all of their drinking water from your system:	N/A



Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?	NA
Indicate how you notified system users that your annual report is available, and is free of charge.	Public access/notice via the web
Indicate if you notified system users that your annual report is available and is free of charge using an alternate method	YES

Facility Description

A prefabricated package water treatment plant, comprising chemical addition, pre-chlorination, coagulation/flocculation, sedimentation, and dual media filtration, followed by pH adjustment, fluoridation and post chlorination, designed for conventional operating parameters at a rated capacity of 818 m³/day, with duty low lift pump starting and stopping the operation of the water treatment plant. Treated water storage consisting of two clear wells each having a capacity of 345 m³. High lift pumps comprising two vertical multistage pumps, each rated at 6.6 L/s and a fire pump with a capacity of 40.1 L/s. The discharge header fitted with pressure relief valve, a pressure gauge, a chlorine injection point, a magnetic flow meter, and sampling point for a chlorine residual analyzer with the discharge header having a system of three hydro-pneumatic tanks, each with 1.6m³ capacity. A 26m³ surge tank receives sludge from the clarifier and backwash waste from the dual media filters, equipped with two centrifugal submersible pumps each rated at 1.0 L/s with clarified supernatant from the 65 m³ settling chamber overflowing to an outfall chamber, and from there to the adjacent creek and from there to the Spanish River. Stand-by power is available from a 160 kW (200 kVa) diesel generator.

Chemicals Used

Poly Aluminum Chloride (PAC)	Coagulation
Magnafloc LT 27 AG (Polymer)	Coagulation aide
Sodium Hypochlorite 12%	Disinfection
Hydrofluorosilicic Acid (25% HFS)	Fluoride
Soda Ash (dense)	Alkalinity and pH control

Significant Expenses

Significant expenses incurred to

- Install required equipment
- Repair required equipment
- Replace required equipment

Work Order	Completion Date	Comment
626958	08-Mar-18	<i>Chemical Pumps</i> Ordered 3 new chemical pump heads
701952	08-Mar-18	<i>Generator</i> The environmental controls in the generator room were repaired by Metal Air



Adverse Water Quality Incidents

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre					
Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
N/A	N/A	N/A	N/A	N/A	N/A

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03.

	No. of Samples Collected	Range of E.Coli		Range of Total Coliform Results		Number of HPC Samples	Range of HPC Results	
		Min #	Max #	Min #	Max #		Min #	Max #
Raw Water	52	0	20	7	460	0		
Treated Water	52	0	0	0	0	52	0	2
Distribution	104	0	0	0	0	52	0	4

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, On-Line (NTU) - Filt1	8760	0.01	5
Free Chlorine Residual, Treated (mg/L)	8760	0	5
Free Chlorine Residual, Distribution Location 1	102	0.51	1.57
Free Chlorine Residual, Distribution Location 2	102	0.62	1.51
Free Chlorine Residual, Distribution Location 3	102	0.7	1.52
Free Chlorine Residual, Distribution Location 4	53	0.55	1.36

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument. (Use monitoring BW TSS sheet to Paste and Copy)

Date of legal instrument issued	Parameter and limits	Month Sampled	Day Sampled	Result	Unit of Measure
MDWL 281-101 November 25, 2015	Backwash (BW) Total Suspended Solids (TSS) 25 mg/L annual average	Jan	22	19	mg/L
		Feb	20	69	mg/L
		Mar	19	3	mg/L
		Apr	23	<2	mg/L
		May	22	4	mg/L
		Jun	18	19	mg/L
		Jul	16	<2	mg/L
		Aug	27	2	mg/L
		Sep	24	5	mg/L
		Oct	22	2	mg/L
		Nov	20	3	mg/L
		Dec	20	11	mg/L
		Annual Average			



Summary of Inorganic parameters tested during this reporting period or the most recent sample results

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
TREATED WATER				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW	2018/01/16	<MDL 0.02	6.0	No	No
Arsenic: As (ug/L) - TW	2018/01/16	<MDL 0.2	25.0	No	No
Barium: Ba (ug/L) - TW	2018/01/16	5.36	1000.0	No	No
Boron: B (ug/L) - TW	2018/01/16	4.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2018/01/16	<MDL 0.003	5.0	No	No
Chromium: Cr (ug/L) - TW	2018/01/16	0.18	50.0	No	No
Mercury: Hg (ug/L) - TW	2018/01/16	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2018/01/16	0.04	10.0	No	No
Uranium: U (ug/L) - TW	2018/01/16	<MDL 0.002	20.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
TREATED WATER				MAC	1/2 MAC
Fluoride (mg/L) - TW	2017/01/26	<MDL 0.06	1.5	No	No
Nitrite (mg/L) - TW	2018/01/16	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2018/04/03	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2018/07/23	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2018/10/09	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2018/01/16	0.092	10.0	No	No
Nitrate (mg/L) - TW	2018/04/03	0.132	10.0	No	No
Nitrate (mg/L) - TW	2018/07/23	0.06	10.0	No	No
Nitrate (mg/L) - TW	2018/10/09	0.072	10.0	No	No
Sodium: Na (mg/L) - TW	2017/01/26	10.4	20*	No	Yes

*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

Summary of Lead testing under Schedule 15.1 during this reporting period

Location Type	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Distribution - Lead Results (ug/L)	2	0.04	2.77	10	0
Distribution - Alkalinity (mg/L)	2	11	18	n/a	n/a
Distribution - pH In-House	2	6.9	7.15	n/a	n/a



Summary of Organic parameters sampled during this reporting period or the most recent sample results

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
TREATED WATER				MAC	1/2 MAC
Alachlor (ug/L) - TW	2018/01/16	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2018/01/16	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW	2018/01/16	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2018/01/16	<MDL 0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW	2018/01/16	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2018/01/16	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2018/01/16	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW	2018/01/16	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2018/01/16	<MDL 0.16	5.00	No	No
Chlorpyrifos (ug/L) - TW	2018/01/16	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2018/01/16	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2018/01/16	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2018/01/16	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2018/01/16	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2018/01/16	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2018/01/16	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2018/01/16	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2018/01/16	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2018/01/16	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2018/01/16	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2018/01/16	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW	2018/01/16	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2018/01/16	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2018/01/16	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2018/01/16	<MDL 0.02	190.00	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA) (mg/L) - TW	2018/01/16	<MDL 0.01	N/A	N/A	N/A
Metolachlor (ug/L) - TW	2018/01/16	<MDL 0.02	50.00	No	No
Metribuzin (ug/L) - TW	2018/01/16	<MDL 0.3	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2018/01/16	<MDL 1.0	80.00	No	No
Paraquat (ug/L) - TW	2018/01/16	<MDL 0.04	10.00	No	No
PCB (ug/L) - TW	2018/01/16	<MDL 0.15	3.00	No	No
Pentachlorophenol (ug/L) - TW	2018/01/16	<MDL 0.01	60.00	No	No
Phorate (ug/L) - TW	2018/01/16	<MDL 1.0	2.00	No	No
Picloram (ug/L) - TW	2018/01/16	<MDL 0.03	190.00	No	No
Prometryne (ug/L) - TW	2018/01/16	<MDL 0.01	1.00	No	No
Simazine (ug/L) - TW	2018/01/16	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2018/01/16	<MDL 0.35	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2018/01/16	<MDL 0.2	30.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2018/01/16	<MDL 0.01	100.00	No	No
Triallate (ug/L) - TW	2018/01/16	<MDL 0.44	230.00	No	No



Trichloroethylene (ug/L) - TW	2018/01/16	<MDL 0.25	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2018/01/16	<MDL 0.12	5.00	No	No
Trifluralin (ug/L) - TW	2018/01/16	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2018/01/16	<MDL 0.17	2.00	No	No
DISTRIBUTION WATER					
Trihalomethane: Total (ug/L) Annual Average - DW	2018/12/31	61.0	100.00	No	No
HAA Total (ug/L) Annual Average – DW	2018/12/31	56.97		N/A	N/A

SECTION 5: RAW WATER SUBMISSIONS

Raw water flows were submitted to the MOECC on [February 12, 2019](#).



Location: [WTRS](#) / [WT DATA](#) / [Input WT Record](#)

WTRS-WT-008

Water Taking Data submitted successfully.

Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 2003-7TDPEP
Permit Holder: THE CORPORATION OF THE TOWNSHIP OF NAIRN AND HYMAN.
Received on: Feb 12, 2019 4:34 PM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.

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NAIRN2 HYMAN2 | 2019/02/12
version: v4.5.0.21 (build#: 22)
Last modified: 2018/09/18

SECTION 6: CONCLUSION

The [Nairn Centre WTP](#) delivers water that, in all its treated and distribution samples, indicates the water to be free of bacteriological contamination.

For the 2018 operating year, the [Nairn Centre WTP](#) did not exceed daily regulatory water taking limits but did exceed PTTW flow rates. The exceedance occurred when the low lift pump was plugged. The operators had opened the flow control valve in an attempt to increase flows but this did not work. They then found the issue with the pump and unclogged it. They forgot to adjust the flow control valve before turning the pump on again.



List of Acronyms and Definitions

Alkalinity	The capacity of water for neutralizing an acid solution
AWQI	Adverse Water Quality Incident- when a water sample test result exceeds the Ontario Drinking Water Quality Standards
Backwash	Water pumped backwards to clean filters
BWA	Boil Water Advisory; Issued when risk of contamination is possible in drinking water
CFU	Colony Forming Units
Chlorine Residual	A low level of chlorine remaining in water after disinfection occurs
DW	Distribution Water
DWA	Drinking Water Advisory; Issued when water cannot be consumed by any means
DWWP	Drinking Water Works Permit - provides a description of the overall system
E.Coli	Bacteria used as indicators to measure the degree of pollution and sanitary quality of water
GUDI 170/03	Groundwater Under Direct Influence – Considered to be surface water under O.Reg
HPC	Heterotrophic Plant Count
L/s	Litres per Second
m ³ /d	Cubic Metres per Day
MAC	Maximum Acceptable Concentration
MDL	Minimum Detection Level
MDWL requirements	Municipal Drinking Water Licence - relates to the operation and performance
mg/L	Miligrams per Litre
Ministry	Ministry of the Environment and Climate Change
MOECC	Ministry of the Environment and Climate Change
O.Reg	Ontario Regulation
PTTW water	Permit to Take Water – Permit which allows water taking from groundwater or surface
RW	Raw Water
TC	Total Coliforms
TSS	Total Suspended Solids
Turbidity	Cloudiness or haziness of water
TW	Treated Water



Appendix A

Raw Water Flows

Ontario Clean Water Agency
Annual Water Taking and Transfer Report
 From 01/01/2018 To 12/31/2018

Facility: NAIRN CENTRE DRINKING WATER SYSTEM-5042
 Tag: Raw Flow: Sum (m3/d)
 Tag Group: Raw Water

Permit#: 2003-7TDPEP
 Source Name: Spanish River
 Source: River
 Type:
 Purpose: Municipal

Coordinate Zone: 17
 Easting: 455049
 Northing: 5131662
 Method deter: Metered

Date Measured	Value (m³/d)	Value (Litres)
01/01/2018	176.8000	176800.0000
02/01/2018	173.4000	173400.0000
03/01/2018	177.5000	177500.0000
04/01/2018	177.3000	177300.0000
05/01/2018	149.1000	149100.0000
06/01/2018	173.5000	173500.0000
07/01/2018	186.3000	186300.0000
08/01/2018	175.5000	175500.0000
09/01/2018	176.2000	176200.0000
10/01/2018	150.8000	150800.0000
11/01/2018	154.5000	154500.0000
12/01/2018	162.8000	162800.0000
13/01/2018	166.4000	166400.0000
14/01/2018	184.4000	184400.0000
15/01/2018	188.5000	188500.0000
16/01/2018	143.2000	143200.0000
17/01/2018	125.4000	125400.0000
18/01/2018	185.1000	185100.0000
19/01/2018	144.0000	144000.0000
20/01/2018	166.8000	166800.0000
21/01/2018	172.8000	172800.0000
22/01/2018	176.1000	176100.0000
23/01/2018	139.5000	139500.0000
24/01/2018	152.5000	152500.0000
25/01/2018	166.4000	166400.0000
26/01/2018	170.9000	170900.0000
27/01/2018	141.1000	141100.0000
28/01/2018	167.0000	167000.0000
29/01/2018	177.3000	177300.0000
30/01/2018	146.2000	146200.0000
31/01/2018	139.2000	139200.0000
01/02/2018	160.1000	160100.0000
02/02/2018	172.0000	172000.0000
03/02/2018	148.2000	148200.0000
04/02/2018	167.9000	167900.0000
05/02/2018	189.9000	189900.0000
06/02/2018	160.6000	160600.0000
07/02/2018	184.4000	184400.0000
08/02/2018	181.2000	181200.0000
09/02/2018	180.2000	180200.0000
10/02/2018	156.7000	156700.0000
11/02/2018	150.8000	150800.0000

12/02/2018	129.8000	129800.0000
13/02/2018	237.6000	237600.0000
14/02/2018	166.0000	166000.0000
15/02/2018	163.2000	163200.0000
16/02/2018	188.9000	188900.0000
17/02/2018	182.4000	182400.0000
18/02/2018	171.7000	171700.0000
19/02/2018	186.1000	186100.0000
20/02/2018	145.3000	145300.0000
21/02/2018	141.3000	141300.0000
22/02/2018	165.2000	165200.0000
23/02/2018	173.8000	173800.0000
24/02/2018	190.9000	190900.0000
25/02/2018	190.4000	190400.0000
26/02/2018	148.4000	148400.0000
27/02/2018	159.6000	159600.0000
28/02/2018	175.1000	175100.0000
01/03/2018	194.0000	194000.0000
02/03/2018	162.2000	162200.0000
03/03/2018	176.1000	176100.0000
04/03/2018	192.0000	192000.0000
05/03/2018	162.2000	162200.0000
06/03/2018	179.5000	179500.0000
07/03/2018	141.7000	141700.0000
08/03/2018	179.7000	179700.0000
09/03/2018	184.1000	184100.0000
10/03/2018	194.0000	194000.0000
11/03/2018	177.2000	177200.0000
12/03/2018	167.5000	167500.0000
13/03/2018	166.0000	166000.0000
14/03/2018	158.7000	158700.0000
15/03/2018	156.2000	156200.0000
16/03/2018	172.9000	172900.0000
17/03/2018	176.6000	176600.0000
18/03/2018	199.0000	199000.0000
19/03/2018	178.8000	178800.0000
20/03/2018	176.0000	176000.0000
21/03/2018	155.3000	155300.0000
22/03/2018	192.0000	192000.0000
23/03/2018	161.6000	161600.0000
24/03/2018	174.0000	174000.0000
25/03/2018	201.8000	201800.0000
26/03/2018	166.1000	166100.0000
27/03/2018	168.9000	168900.0000
28/03/2018	188.6000	188600.0000
29/03/2018	170.7000	170700.0000
30/03/2018	158.3000	158300.0000
31/03/2018	193.2000	193200.0000
01/04/2018	196.4000	196400.0000
02/04/2018	146.9000	146900.0000
03/04/2018	205.2000	205200.0000
04/04/2018	188.9000	188900.0000
05/04/2018	133.8000	133800.0000
06/04/2018	189.0000	189000.0000
07/04/2018	197.7000	197700.0000
08/04/2018	167.4000	167400.0000
09/04/2018	190.2000	190200.0000
10/04/2018	192.9000	192900.0000
11/04/2018	161.8000	161800.0000
12/04/2018	177.8000	177800.0000
13/04/2018	178.3000	178300.0000

14/04/2018	153.3000	153300.0000
15/04/2018	204.1000	204100.0000
16/04/2018	159.1000	159100.0000
17/04/2018	189.6000	189600.0000
18/04/2018	214.4000	214400.0000
19/04/2018	159.9000	159900.0000
20/04/2018	195.9000	195900.0000
21/04/2018	207.1000	207100.0000
22/04/2018	214.1000	214100.0000
23/04/2018	172.7000	172700.0000
24/04/2018	307.7000	307700.0000
25/04/2018	289.7000	289700.0000
26/04/2018	198.3000	198300.0000
27/04/2018	142.7000	142700.0000
28/04/2018	207.6000	207600.0000
29/04/2018	212.3000	212300.0000
30/04/2018	180.2000	180200.0000
01/05/2018	180.0000	180000.0000
02/05/2018	228.5000	228500.0000
03/05/2018	190.4000	190399.9939
04/05/2018	153.9000	153899.9939
05/05/2018	199.0000	199000.0000
06/05/2018	197.5000	197500.0000
07/05/2018	162.5000	162500.0000
08/05/2018	154.5000	154500.0000
09/05/2018	185.3000	185300.0031
10/05/2018	162.8000	162800.0031
11/05/2018	178.7000	178699.9969
12/05/2018	198.9000	198899.9939
13/05/2018	193.5000	193500.0000
14/05/2018	170.0000	170000.0000
15/05/2018	194.6000	194600.0061
16/05/2018	200.1000	200100.0061
17/05/2018	166.5000	166500.0000
18/05/2018	212.9000	212899.9939
19/05/2018	221.6000	221600.0061
20/05/2018	235.6000	235600.0061
21/05/2018	268.7000	268700.0122
22/05/2018	245.7000	245699.9969
23/05/2018	234.1000	234100.0061
24/05/2018	231.9000	231899.9939
25/05/2018	217.8000	217800.0031
26/05/2018	189.2000	189199.9969
27/05/2018	256.6000	256600.0061
28/05/2018	242.7000	242699.9969
29/05/2018	251.6000	251600.0061
30/05/2018	238.4000	238399.9939
31/05/2018	198.4000	198399.9939
01/06/2018	210.1000	210100.0061
02/06/2018	252.2000	252199.9969
03/06/2018	200.5000	200500.0000
04/06/2018	191.7000	191699.9969
05/06/2018	212.3000	212300.0031
06/06/2018	245.7000	245699.9969
07/06/2018	214.0000	214000.0000
08/06/2018	227.3000	227300.0031
09/06/2018	268.8000	268799.9878
10/06/2018	319.6000	319600.0061
11/06/2018	290.3000	290299.9878
12/06/2018	296.5000	296500.0000
13/06/2018	235.0000	235000.0000

14/06/2018	215.0000	215000.0000
15/06/2018	295.2000	295200.0122
16/06/2018	288.5000	288500.0000
17/06/2018	324.3000	324299.9878
18/06/2018	253.6000	253600.0061
19/06/2018	259.6000	259600.0061
20/06/2018	302.4000	302399.9939
21/06/2018	274.9000	274899.9939
22/06/2018	347.4000	347399.9939
23/06/2018	309.0000	309000.0000
24/06/2018	281.7000	281700.0122
25/06/2018	316.1000	316100.0061
26/06/2018	392.2000	392200.0122
27/06/2018	307.4000	307399.9939
28/06/2018	474.3000	474299.9878
29/06/2018	342.2000	342200.0122
30/06/2018	213.3000	213300.0031
01/07/2018	208.8000	208800.0031
02/07/2018	309.8000	309799.9878
03/07/2018	301.2000	301200.0122
04/07/2018	373.3000	373299.9878
05/07/2018	351.2000	351200.0122
06/07/2018	327.9000	327899.9939
07/07/2018	325.6000	325600.0061
08/07/2018	372.2000	372200.0122
09/07/2018	262.9000	262899.9939
10/07/2018	302.2000	302200.0122
11/07/2018	295.9000	295899.9939
12/07/2018	227.5000	227500.0000
13/07/2018	210.7000	210699.9969
14/07/2018	248.5000	248500.0000
15/07/2018	373.2000	373200.0122
16/07/2018	397.4000	397399.9939
17/07/2018	288.3000	288299.9878
18/07/2018	332.0000	332000.0000
19/07/2018	343.6000	343600.0061
20/07/2018	358.3000	358299.9878
21/07/2018	402.2000	402200.0122
22/07/2018	201.6000	201600.0061
23/07/2018	231.1000	231100.0061
24/07/2018	210.8000	210800.0031
25/07/2018	255.3000	255300.0031
26/07/2018	234.5000	234500.0000
27/07/2018	261.6000	261600.0061
28/07/2018	225.6000	225600.0061
29/07/2018	266.2000	266200.0122
30/07/2018	253.7000	253699.9969
31/07/2018	347.8000	347799.9878
01/08/2018	332.2000	332200.0122
02/08/2018	272.9000	272899.9939
03/08/2018	295.3000	295299.9878
04/08/2018	315.2000	315200.0122
05/08/2018	253.2000	253199.9969
06/08/2018	168.6000	168600.0061
07/08/2018	179.0000	179000.0000
08/08/2018	281.4000	281399.9939
09/08/2018	263.7000	263700.0122
10/08/2018	291.3000	291299.9878
11/08/2018	201.5000	201500.0000
12/08/2018	309.4000	309399.9939
13/08/2018	415.9000	415899.9939

14/08/2018	315.3000	315299.9878
15/08/2018	257.2000	257200.0122
16/08/2018	300.7000	300700.0122
17/08/2018	284.8000	284799.9878
18/08/2018	318.2000	318200.0122
19/08/2018	347.8000	347799.9878
20/08/2018	206.8000	206800.0031
21/08/2018	218.8000	218800.0031
22/08/2018	196.9000	196899.9939
23/08/2018	203.4000	203399.9939
24/08/2018	239.7000	239699.9969
25/08/2018	169.7000	169699.9969
26/08/2018	212.4000	212399.9939
27/08/2018	145.0000	145000.0000
28/08/2018	193.5000	193500.0000
29/08/2018	260.7000	260700.0122
30/08/2018	193.0000	193000.0000
31/08/2018	181.4000	181399.9939
01/09/2018	191.2000	191199.9969
02/09/2018	156.5000	156500.0000
03/09/2018	194.4000	194399.9939
04/09/2018	161.3000	161300.0031
05/09/2018	163.6000	163600.0061
06/09/2018	177.4000	177399.9939
07/09/2018	196.5000	196500.0000
08/09/2018	163.6000	163600.0061
09/09/2018	219.6000	219600.0061
10/09/2018	164.8000	164800.0031
11/09/2018	175.5000	175500.0000
12/09/2018	184.4000	184399.9939
13/09/2018	180.6000	180600.0061
14/09/2018	176.0000	176000.0000
15/09/2018	204.3000	204300.0031
16/09/2018	206.3000	206300.0031
17/09/2018	213.3000	213300.0031
18/09/2018	273.6000	273600.0061
19/09/2018	193.9000	193899.9939
20/09/2018	224.5000	224500.0000
21/09/2018	169.8000	169800.0031
22/09/2018	145.1000	145100.0061
23/09/2018	190.0000	190000.0000
24/09/2018	171.1000	171100.0061
25/09/2018	177.4000	177399.9939
26/09/2018	190.6000	190600.0061
27/09/2018	173.4000	173399.9939
28/09/2018	181.8000	181800.0031
29/09/2018	170.0000	170000.0000
30/09/2018	164.4000	164399.9939
01/10/2018	185.5000	185500.0000
02/10/2018	166.7000	166699.9969
03/10/2018	207.1000	207100.0061
04/10/2018	169.8000	169800.0031
05/10/2018	162.5000	162500.0000
06/10/2018	138.2000	138199.9969
07/10/2018	177.0000	177000.0000
08/10/2018	186.2000	186199.9969
09/10/2018	162.2000	162199.9969
10/10/2018	162.1000	162100.0061
11/10/2018	174.6000	174600.0061
12/10/2018	157.1000	157100.0061
13/10/2018	174.8000	174800.0031

14/10/2018	168.8000	168800.0031
15/10/2018	163.1000	163100.0061
16/10/2018	171.6000	171600.0061
17/10/2018	154.5000	154500.0000
18/10/2018	179.1000	179100.0061
19/10/2018	147.6000	147600.0061
20/10/2018	175.9000	175899.9939
21/10/2018	178.1000	178100.0061
22/10/2018	163.7000	163699.9969
23/10/2018	178.3000	178300.0031
24/10/2018	168.3000	168300.0031
25/10/2018	170.3000	170300.0031
26/10/2018	155.0000	155000.0000
27/10/2018	172.9000	172899.9939
28/10/2018	174.7000	174699.9969
29/10/2018	148.2000	148199.9969
30/10/2018	172.7000	172699.9969
31/10/2018	176.0000	176000.0000
01/11/2018	165.0000	165000.0000
02/11/2018	167.8000	167800.0031
03/11/2018	160.0000	160000.0000
04/11/2018	160.4000	160399.9939
05/11/2018	175.9000	175899.9939
06/11/2018	169.5000	169500.0000
07/11/2018	120.2000	120199.9969
08/11/2018	227.0000	227000.0000
09/11/2018	127.7000	127699.9969
10/11/2018	165.0000	165000.0000
11/11/2018	162.2000	162199.9969
12/11/2018	216.5000	216500.0000
13/11/2018	84.1000	84099.9985
14/11/2018	209.4000	209399.9939
15/11/2018	119.1000	119099.9985
16/11/2018	193.7000	193699.9969
17/11/2018	135.3000	135300.0031
18/11/2018	212.9000	212899.9939
19/11/2018	141.7000	141699.9969
20/11/2018	171.4000	171399.9939
21/11/2018	182.7000	182699.9969
22/11/2018	142.1000	142100.0061
23/11/2018	134.6000	134600.0061
24/11/2018	289.1000	289100.0061
25/11/2018	249.2000	249199.9969
26/11/2018	194.4000	194399.9939
27/11/2018	185.8000	185800.0031
28/11/2018	267.7000	267700.0122
29/11/2018	180.6000	180600.0061
30/11/2018	184.3000	184300.0031
01/12/2018	254.2000	254199.9969
02/12/2018	225.0000	225000.0000
03/12/2018	189.8000	189800.0031
04/12/2018	218.1000	218100.0061
05/12/2018	195.7000	195699.9969
06/12/2018	205.0000	205000.0000
07/12/2018	183.8000	183800.0031
08/12/2018	270.9000	270899.9939
09/12/2018	168.7000	168699.9969
10/12/2018	256.1000	256100.0061
11/12/2018	189.9000	189899.9939
12/12/2018	176.7000	176699.9969
13/12/2018	233.1000	233100.0061

14/12/2018	178.4000	178399.9939
15/12/2018	277.6000	277600.0061
16/12/2018	211.4000	211399.9939
17/12/2018	145.5000	145500.0000
18/12/2018	209.6000	209600.0061
19/12/2018	235.9000	235899.9939
20/12/2018	181.8000	181800.0031
21/12/2018	256.5000	256500.0000
22/12/2018	219.0000	219000.0000
23/12/2018	177.6000	177600.0061
24/12/2018	259.6000	259600.0061
25/12/2018	191.6000	191600.0061
26/12/2018	218.9000	218899.9939
27/12/2018	186.5000	186500.0000
28/12/2018	237.0000	237000.0000
29/12/2018	219.4000	219399.9939
30/12/2018	221.0000	221000.0000
31/12/2018	205.6000	205600.0061