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December 6, 2021

Mr. Troy Gilmour
Township of Alnwick/Haldimand
Chief Administrative Officer
10836 County Road 2
P.O. Box 70 Grafton ON
K0K 2G0

Dear Mr. Gilmour,

Re: Compliance Inspection Report for the Grafton Drinking Water System

The enclosed report documents findings of the inspection that was performed at the Grafton Drinking Water System on November 2, 2021.

“Non-Compliances”, are found on page 3 of the report, are linked to incidents of non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, licenses, permits, orders, or instructions. Such violations could result in the issuance of mandatory abatement instruments including Orders, tickets, penalties, or referrals to the ministry’s Investigations and Enforcement Branch. Please note that the required actions may contain required dates for completion.

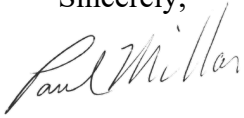
“Recommended Actions”, as Other Inspection Findings are found also on page 3 of the report, convey information that the owner or operating authority should consider implementing in order to advance efforts already in place to address such issues as emergency preparedness, the fulsome availability of information to consumers, and conformance with existing and emerging industry standards. Please note that items which appear as recommended actions do not, in themselves, constitute violations.

“Please note that due to a change in IT systems, the Inspection Rating Report (IRR) cannot be generated at the same time as the inspection report. The IRR will be sent separately and prior to any public release (typically within 1-2 month of the completion of the inspection)”.

Thank you for the assistance afforded to me during the conduct of the compliance assessment.

Should you have any questions regarding the content of the enclosed report please do not hesitate to contact me.

Sincerely,



Paul Millar
Water Inspector
(613) 827-2531
Fax: (613) 962-6809
E-mail: paul.millar@ontario.ca

Enclosure (1)

SI NO AH GR ED 540 (2021/22)

c:

Mr. Larry Spyrka, Operating Authority, Lakefront Utilities – Manager

Dr. Natalie Bocking, Medical Officer of Health, Haliburton, Kawartha, Pine Ridge District
Health Unit

Ms. Rhonda Bateman, CAO/Treasurer, Lower Trent Conservation Authority, 714 Murray Street,
RR1, Trenton, ON K8V 5P4

Ms. Jacqueline Fuller, Water Supervisor, Ministry of Environment, Conservation & Parks,
Peterborough

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A. Risk Methodology



Grafton Drinking Water System
434 EDWARDSON RD, ALNWICK-HALDIMAND, ON,

Inspection Report

System Number:	220009158
Inspection Start Date:	11/02/2021
Inspection End Date:	12/06/2021
Inspected By:	Paul Millar
Badge #:	1130



(signature)

NON-COMPLIANCE/NON-CONFORMANCE ITEMS

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

Question Group: Other Inspection Findings

Question ID	MRDW1116000	
Question	Question Type	Legislative Requirement
Were the inspection questions sufficient to address other identified best practice issues?	BMP	Not Applicable
Observation/Corrective Action(s)		
<p>The following issues were also noted during the inspection:</p> <p>It is recommended that the Drinking Water System Owner &/or Operating Authority consider acting on the following;</p> <ol style="list-style-type: none"> 1.) Discussing the elevated ammonia concentrations identified in production well #1 with the local Health Unit prior to it being called into service. 2.) Determine where the floor drains and water from the exterior WW holding tank discharges to & ensure that any effluent is de-chlorinated before reaching the natural environment. 3.) Revising the O/M Manual to include a "Table of Contents" referencing where the Municipal License, Sch. B, Condition 16.0 - O/M Manual conditions can be located within, as well as the Contingency Plans, SOPs, and the new 2020 - Watermain Disinfection Procedure. 4.) Formalize internal efforts in writing taken to prevent falsification of training & log records 5.) Amend the current DWWP, Schedule A, Chlorine Addition section the next time amendments are being sought so as to remove reference to; Two (2) metering pumps (duty and standby) each capable of 4 L/hr. complete with one (1) storage tank for secondary disinfection 6.) Remove reference to the data obtained from the chlorine residual analyzer located near the bulk water fill station, incorrectly identified as a secondary chlorine unit (AIT 822). 7.) Revise ERP-02 - Raw Water Contamination, dated July 24, 2019, to include contacting MECP & local Health unit. 8.) Enhance the existing Emergency Contact List to include reference to Health unit, MECP, Equipment & Electrical Contractors & Suppliers,, Bulk Water Haulers & Hydro One for example. 9.) It is recommended that whenever numerical flow data is above the PTTW limit that staff capture the number of these event per 72 Reviews, and duration, where possible. Should the events be > 5 minutes in duration the O/A should capture, the number of events, the cause, where know, and actions taken to address, where applicable. 		

INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

Ministry Program: Regulated Activity: DRINKING WATER : DW Municipal Residential

Question ID	MRDW1001000	
Question	Question Type	Legislative Requirement
What was the scope of this inspection?	Information	Not Applicable
Observation		
<p>The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.</p> <p>This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.</p> <p>This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.</p> <p>On November 2, 2021, the undersigned Ministry of the Environment, Conservation and Parks (MECP) Water Inspector visited the Grafton Drinking Water System (DWS) for the purpose of performing a focused, announced drinking-water system inspection. The MECP Inspector was accompanied during the physical inspection of the water treatment plant by Mr. Larry Spyrka, Manager of Water Capital Projects, as well as Mr. Ryan Smith, Duty Operator/Operator In Charge & Ms. Mina Aminnejad, recently hired to support compliance.</p> <p>The Corporation of the Township of Alnwick/Haldimand is the owner of the drinking water system, with Lakefront Utility Services Incorporated (L.U.S.I.) identified as the Operating Authority of the entire drinking water system, including the distribution system.</p> <p>The Grafton Drinking Water system serves approximately ~1000 residents, and under the Regulation is therefore considered to be a large municipal residential system, subject to the Regulation.</p> <p>The drinking water inspection included a physical inspection of the treatment plant, production wells and plant exterior, as well as a document review for the period of Oct.1, 2020 to Oct. 31, 2021, hereafter, referred to as the inspection period in this report.</p> <p>Last year's inspection did not cite any Issues of Non-Compliances or Best Practice Issues and</p>		

Recommendations.

Question ID	MRDW1000000	
Question	Question Type	Legislative Requirement
Does this drinking water system provide primary disinfection?	Information	Not Applicable
Observation		
This Drinking Water System provides for both primary and secondary disinfection and distribution of water.		
Primary disinfection is achieved utilizing chlorination coupled with sufficient contact times.		

Question ID	MRDW1007000	
Question	Question Type	Legislative Requirement
Is the owner maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials?	Legislative	SDWA O. Reg. 170/03 1-2 (1)
Observation		
The owner was maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials.		
During the physical inspection of the water treatment plant and the wells, it was identified that each of the production wells were surrounded by chain link fencing, that was topped with barbed wire and each were equipped with padlocks on the entry gates. Further, all steel well casings were capped with suitable well caps, with the exception of the older former production well-TW3. This well is being utilized for water level monitoring purposes. Sloping around each of the wells appeared adequate and all casing were above grade. Further, it was reported that on a monthly basis a work order is generated and assigned to staff to inspect the above ground components to confirm integrity. According to records provided the below ground component and casing were video inspected, with well#2 having a new pump installed. The work was carried out by International Water Supply Limited in 2019 (July, Oct. & Nov.).		

Question ID	MRDW1009000	
Question	Question Type	Legislative Requirement
Are measures in place to protect the groundwater and/or GUDI source in accordance with any MDWL and DWWP issued under Part V of the SDWA?	Legislative	SDWA 31 (1)
Observation		
Measures were in place to protect the groundwater and/or GUDI source in accordance with any the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.		

Measures to protect the source water have been identified in Municipal License and Permit #238-101/238-201, as well as Permit To Take Water #5086-9BPM4A. Each of the aforementioned documents prescribes limits as to the water treatment plant's rated capacity &/or the amounts of water that can be taken from either potential well source. In addition, as previously mentioned the O/A undertakes monthly inspections of the wells.

Question ID	MRDW1014000	
Question	Question Type	Legislative Requirement
Is there sufficient monitoring of flow as required by the MDWL or DWWP issued under Part V of the SDWA?	Legislative	SDWA 31 (1)
Observation		
<p>There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.</p> <p>Municipal License #238-101, Schedule C, section 2.0, states that the Drinking Water System (DWS) shall ensure continuous flow measurement and recording for;</p> <p>2.1.1) the flow rate and daily volume of treated water that flows from the treatment system conveyed into the treatment sub system to the distribution system and;</p> <p>2.1.2) the flow rate and daily volume of water that flows into the treatment subsystem.</p> <p>During the field inspection of the water treatment pumphouse three (3) flow meters were identified, to include two (2) ABB mag meters, monitoring the raw & treated waters, as well as a third Siemens mag meter unit monitoring the bulk water fill station.</p>		

Question ID	MRDW1016000	
Question	Question Type	Legislative Requirement
Is the owner in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the MDWL issued under Part V of the SDWA?	Legislative	SDWA 31 (1)
Observation		
<p>The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Municipal Drinking Water Licence issued under Part V of the SDWA.</p> <p>A review of the treated water flow data recorded over the inspection period (Oct.1/20-Oct. 31/21) indicates that there were not any incidences where the flows exceeded the limit of 1253 M3/day. Flows ranged from 144 - 864 m3/d. These values equate to 12% - 69%, of the MDWL maximum allowable daily takings.</p> <p>Of note, in review of the raw water instantaneous flow data provided, multiple flow exceedances were identified, greater than 14.5 L/s or 870 L/min as stipulated within Permit To Take Water #5086-9PBM4A, Condition 3.2 - Table A. Investigation into these elevated flows has determined that they are of very short duration <5 minutes and considered inconsequential. The reason as reported for these occurrences is that the water in the piping from the well head to the flow meter</p>		

drains when the well pump goes off-line thereby affecting flows into the process once the well pump is restarted as there would be no "head" during this period, resembling a condition of open pipe. The issue was discussed with the O/A and the undersigned was advised that an "engineered orifice plate", rated at 12.5 L/s was installed some years back ahead of the flow meter to eliminate the potential for raw water flow exceedances. While numerical records do capture the elevated flow values, trending fails to reveal any spikes or changes.

Question ID	MRDW1030000	
Question	Question Type	Legislative Requirement
Is primary disinfection chlorine monitoring being conducted at a location approved by MDWL and/or DWWP issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved?	Legislative	SDWA O. Reg. 170/03 7-2 (1), SDWA O. Reg. 170/03 7-2 (2)
Observation		
Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.		
Chlorine residual monitoring was observed in place just downstream of the highlift pump discharge header via a Siemens pH compensated continuous monitoring chlorine residual analyzer, reading 1.47 mg/L at the time of review. Records provided indicate that primary chlorine residuals ranged from 0.59 mg/L (May 21) - 2.40 mg/L (Apr.21).		

Question ID	MRDW1033000	
Question	Question Type	Legislative Requirement
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?	Legislative	SDWA O. Reg. 170/03 7-2 (3), SDWA O. Reg. 170/03 7-2 (4)
Observation		
The secondary disinfectant residual was measured as required for the distribution system.		
According to records and reports from staff, secondary disinfectant residuals are sampled & tested "daily", seven (7) days a week.		

Question ID	MRDW1037000	
Question	Question Type	Legislative Requirement
Are all continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or MDWL or DWWP or order, equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5

6?	(1)5-10,SDWA O. Reg. 170/03 6-5 (1.1)
Observation	
<p>All continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.</p> <p>The Grafton DWS utilizes chlorine to satisfy primary & secondary disinfection needs. Consequentially, three (3) Siemens (Wallace & Tiernan) continuous monitoring analyzers are utilized to measure the disinfectant residuals of the water pre-clearwell & at the point where primary disinfection is achieved, as well as a backup unit also capable of measuring the primary disinfectant, incorrectly identified as a "secondary" chlorine residual analyzer.</p> <p>The alarm set-points, as reported are;</p> <ul style="list-style-type: none"> - pre Cl₂ lolo alarm of 0.70 mg.L - lo Cl₂ alarm of 0.75 mg/L - hi Cl₂ alarm of 2.40 mg/L. <p>The pre clearwell analyzer is also reportedly inter-locked with the well pumps and will interrupt their operation should the lolo or hi alarms values be reached.</p> <p>The primary or CT alarm set-points are reported as;</p> <ul style="list-style-type: none"> - lolo Cl₂ alarm of 0.60 mg/L, - lo Cl₂ alarm of 0.70 mg/L - hi Cl₂ alarm of 2.15 mg/L. <p>The redundant primary analyzer will reportedly alarm out at;</p> <ul style="list-style-type: none"> - lolo Cl₂ alarm of 0.60 mg/L, - lo Cl₂ alarm of 0.70 mg/L - hi Cl₂ alarm of 2.0 mg/L. <p>Further, the clearwells are understood to be equipped with ultrasonic level measurement devices with a reported low alarm set-point of 4.0 m.</p> <p>It should be mentioned that the well water levels are also monitored and could be configured to alarm if desired.</p>	

Question ID	MRDW1038000	
Question	Question Type	Legislative Requirement
Is continuous monitoring equipment that is being utilized to fulfill O. Reg. 170/03 requirements performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4
Observation		
<p>Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.</p> <p>Information provided by the Operating Authority indicates that the raw analyzer recorded data is read continuously, with the min/max and mean data sets being captured as per legislation, i.e: Sch. 6-5(1)2i, i.e.: every 5 minutes for primary disinfection chlorine continuous monitoring units,</p>		

Question ID	MRDW1035000	
Question	Question Type	Legislative Requirement
Are operators examining continuous monitoring test results and are they examining the results within 72 hours of the test?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5 (1)5-10
Observation		
<p>Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.</p> <p>Based upon log sheets provided and reports given during the field inspection, staff visit the drinking water system daily, seven (7) days a week, at which time data is captured and reviewed as necessary.</p>		

Question ID	MRDW1040000	
Question	Question Type	Legislative Requirement
Are all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5 (1)5-10
Observation		
All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.		

During the field inspection three (3) Siemens (W/T) continuous monitoring chlorine residual analyzers were identified. They are monitoring the pre (x1) and, post (x2) disinfectant residual concentrations. According to records provided staff will standardize the analyzers daily if need be, otherwise Nichols Water Services is solicited and performs a calibration on an annual basis. Records indicate that this was last completed on June 2/21. According to records all of the units successfully passed the calibrations.

Question ID	MRDW1108000	
Question	Question Type	Legislative Requirement
Where continuous monitoring equipment used for the monitoring of free chlorine residual, total chlorine residual, combined chlorine residual or turbidity, required by Regulation 170, an Order, MDWL, or DWWP issued under Part V, SDWA, has triggered an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5 (1)5-10,SDWA O. Reg. 170/03 6-5 (1.1)
Observation		
Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.		
Based upon information provided there were a total of five (5) alarms that resulted in an operator responding to site. Four (4) of those were as it relates to chlorine residual alarm, with three (3) of those for the pre-disinfectant lo alarm, and one (1) post or primary chlorine residual alarm. The other alarm went out for an elevated discharge flow due to fire department activities. All alarms were address by certified operational staff and without further issue.		

Question ID	MRDW1018000	
Question	Question Type	Legislative Requirement
Has the owner ensured that all equipment is installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?	Legislative	SDWA 31 (1)
Observation		
The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.		

Question ID	MRDW1023000	
Question	Question Type	Legislative Requirement
Do records indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a DWWP	Legislative	SDWA O. Reg. 170/03 1-2 (2)

and/or MDWL issued under Part V of the SDWA at all times that water was being supplied to consumers?		
Observation		
<p>Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Drinking Water Works Permit and/or Municipal Drinking Water Licence issued under Part V of the SDWA at all times that water was being supplied to consumers.</p> <p>A raw water supply which is ground water means water located in subsurface aquifer(s) where the aquifer overburden and soil act as an effective filter that removes micro-organisms and other particles by straining and antagonistic effect, to a level where the water supply may already be potable but disinfection is required as an additional health risk barrier. Where the drinking-water system obtains water from a raw water supply which is ground water, the treatment process must, as a minimum, consist of disinfection and must be credited with achieving an overall performance that provides, at a minimum 2-log (99%) removal or inactivation of viruses before the water is delivered to the first consumer, as is the case for the Grafton Drinking Water System. The treatment system includes two inter-connected underground clearwells (ea 525 m3 - with dimension of ~7.35 M x ~17.55 x ~4-5.8 m), at a minimum level of 4.0 m, along with chlorination, which together has been credited with 2.0+log R/I of Viruses, based on Municipal License #238-101, (issue 3) Schedule E, providing that the CT provided shall be greater than or equal to the CT required to achieve the log removal credits assigned. Liquid sodium hypochlorite (~12%) is injected immediately upstream of clearwell #1 for purposes of satisfying primary & secondary disinfection.</p> <p>CT calculations generated by the undersigned utilizing worst case variables of; max flow rate of 106.25 L/s, baffle factor of 0.3, the lowest free chlorine residual recorded over the inspection period of 0.59 ppm, a max pH of ~8, min clearwell volume of 1050 m3, and a min temperature of ~10 degrees Celsius, yielded CT achieved value of ~29.13 mg.min/L.</p> <p>The required CT value, according to the Ministry's-Procedure for Disinfection of Drinking Water in Ontario, indicates that a CT Required value of 3 mg.min/L is necessary.</p> <p>Please keep in mind that it is highly unlikely that worst case variables like those noted above would all occur at the same time, and as such CT achieved values are expected to be much higher.</p>		

Question ID	MRDW1024000	
Question	Question Type	Legislative Requirement
Do records confirm that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined?	Legislative	SDWA O. Reg. 170/03 1-2 (2)
Observation		

Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.

In review of monthly log sheets provided the secondary disinfectant residuals ranged from 0.50 mg/L (Dec. 13/20 @ 11012 Hwy #2) - 1.77 mg/L (Apr. 18/21 @ Brimley rd).

Question ID	MRDW1062000	
Question	Question Type	Legislative Requirement
Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?	Legislative	SDWA O. Reg. 170/03 7-5
Observation		
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.		

Question ID	MRDW1060000	
Question	Question Type	Legislative Requirement
Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V of the SDWA?	Legislative	SDWA 31 (1)
Observation		
The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.		
Collectively the O/M Manual & documents satisfy the requirements of the ML/DWWP, but it is strongly recommended that all components of the O/M be compiled into one large file or binder for purposes of satisfying the control document in this regard.		

Question ID	MRDW1071000	
Question	Question Type	Legislative Requirement
Has the owner provided security measures to protect components of the drinking water system?	BMP	Not Applicable
Observation		
The owner had provided security measures to protect components of the drinking water system.		
Security was identified during the physical inspection of the Works to include;		

- chain link fencing with locked gates and topped with barbed wire around the 3 wells in proximity to the well house.
- motion sensor cameras inside (x1) and outside (x3).
- locked exterior doors, fitted with alarm contacts.
- staff attendance seven (7) days a week.

Question ID	MRDW1073000	
Question	Question Type	Legislative Requirement
Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?	Legislative	SDWA O. Reg. 128/04 23 (1)
Observation		
<p>The overall responsible operator has been designated for each subsystem.</p> <p>Mr. Spyрка has been identified as the Overall Responsible Operator (ORO) for the entire drinking water system over the inspection period, while Mr. Taggart & Mr. Clarey also served to a lesser extent in this capacity during the term.</p> <p>The Grafton DWS has been categorized as a Class III - Water Distribution & Supply Subsystem, certificate #3012. All parties noted above are acknowledged to possess valid Class III certificates in Water Distribution & Supply Subsystems.</p>		

Question ID	MRDW1074000	
Question	Question Type	Legislative Requirement
Have operators in charge been designated for all subsystems for which comprise the drinking water system?	Legislative	SDWA O. Reg. 128/04 25 (1)
Observation		
<p>Operators-in-charge had been designated for all subsystems which comprised the drinking water system.</p> <p>Lakefront Utilities operational staff are all designated as Operator/s-In-Charge (OIC), to include; Mr. Branden Wherry, Mr. Darren Hanbidge, Mr. Nick Cunningham, Mr. Ryan Smith, Mr. Scott Noble, Mr. Scott Prins, Mr. Shawn Bolendar (left employ), Mr. Shawn Neilson and Mr. Tim Clarey, with the exception of the Compliance Coordinator, Mr. Spyрка and Mr. Taggart.</p>		

Question ID	MRDW1075000	
Question	Question Type	Legislative Requirement
Do all operators possess the required certification?	Legislative	SDWA O. Reg.

		128/04 22
Observation		
All operators possessed the required certification.		

Question ID	MRDW1076000	
Question	Question Type	Legislative Requirement
Do only certified operators make adjustments to the treatment equipment?	Legislative	SDWA O. Reg. 170/03 1-2 (2)
Observation		
Only certified operators made adjustments to the treatment equipment.		

Question ID	MRDW1099000	
Question	Question Type	Legislative Requirement
Do records show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg.. 169/03)?	Information	Not Applicable
Observation		
Records showed that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).		

Question ID	MRDW1096000	
Question	Question Type	Legislative Requirement
Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?	Legislative	SDWA O. Reg. 170/03 6-3 (1)
Observation		
Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.		
A sporadic review of Chain of Custody records provided confirms that staff are capturing chlorine residuals at the same time as microbial sample collection.		

Question ID	MRDW1081000	
Question	Question Type	Legislative Requirement
Are all microbiological water quality monitoring requirements for distribution samples being met?	Legislative	SDWA O. Reg. 170/03 10-2 (1),SDWA O.

		Reg. 170/03 10-2 (2),SDWA O. Reg. 170/03 10-2 (3)
Observation		
<p>All microbiological water quality monitoring requirements for distribution samples were being met.</p> <p>According to records, sampling has been carried out as prescribed by legislation, with three (3) distribution samples being captured every week under review.</p> <p>Each of the samples collected returned results for total coliforms, E.coli and 33% were sampled & tested for HPC.</p> <p>The population of the Town of Grafton is ~1000 persons, and according to O.Reg. 170/03, Sch. 10, subsection 10-2 (1a) drinking water systems with populations of under 100,000 are required to sample & test from 8 dist sites, plus 1 per thousand population, translating to 9 samples as it relates to the Grafton DWS.</p> <p>Records indicate that Lakefront Utilities (LUSI) on behalf of the Township of Alnwick/Haldimand specific to the Grafton DWS, sampled and tested at least twelve (12) samples per month under review.</p>		

Question ID	MRDW1083000	
Question	Question Type	Legislative Requirement
Are all microbiological water quality monitoring requirements for treated samples being met?	Legislative	SDWA O. Reg. 170/03 10-3
Observation		
All microbiological water quality monitoring requirements for treated samples were being met.		

Question ID	MRDW1084000	
Question	Question Type	Legislative Requirement
Are all inorganic water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-2
Observation		
<p>All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.</p> <p>Schedule 23 - Inorganic sampling was last carried out on January 13, 2020.</p> <p>Please be advised that a large municipal drinking water system with true groundwater is obligated to sample & test the treated water every thirty-six (36)months, as per O.Reg. 170/03, Schedule 13-</p>		

2 (1b).

Question ID		MRDW1085000
Question	Question Type	Legislative Requirement
Are all organic water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-4 (1),SDWA O. Reg. 170/03 13-4 (2),SDWA O. Reg. 170/03 13-4 (3)
Observation		
<p>All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.</p> <p>Schedule 24 - Organic sampling was last carried out on January 13, 2020.</p> <p>Please be advised that a large municipal drinking water system with true groundwater is obligated to sample & test the treated water every thirty-six (36)months, as per O.Reg. 170/03, Schedule 13-4 (1b).</p>		

Question ID		MRDW1086000
Question	Question Type	Legislative Requirement
Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?	Legislative	SDWA O. Reg. 170/03 13-6.1 (1),SDWA O. Reg. 170/03 13-6.1 (2),SDWA O. Reg. 170/03 13-6.1 (3), SDWA O. Reg. 170/03 13-6.1 (4),SDWA O. Reg. 170/03 13-6.1 (5),SDWA O. Reg. 170/03 13-6.1 (6)
Observation		
<p>All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.</p> <p>Records provided indicate that sampling for HAAs last occurred on July 12, 2021, yielding a</p>		

result of 5.3 ug/L <MDL and consistently every quarter over the inspection period.

Question ID	MRDW1087000	
Question	Question Type	Legislative Requirement
Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?	Legislative	SDWA O. Reg. 170/03 13-6 (1)
Observation		
All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.		
Records provided indicate that sampling for HAAs last occurred on July 12/ 21, yielding a result of 21 ug/L, with sample results over the inspection period ranging from 21 - 24 ug/L, as sampled every quarter.		

Question ID	MRDW1088000	
Question	Question Type	Legislative Requirement
Are all nitrate/nitrite water quality monitoring requirements prescribed by legislation conducted within the required frequency for the DWS?	Legislative	SDWA O. Reg. 170/03 13-7
Observation		
All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.		
Records indicate that sampling for Nitrite (N02) and Nitrates (N03) were last conducted on July 15, 2021, from the treated water. Prior to this, samples were collected quarterly. Based on the above sampling Nitrate results ranged from 0.19 - 0. 22 mg/L, with Nitrite results remained steady at 0.03 mg/L <MDL		

Question ID	MRDW1089000	
Question	Question Type	Legislative Requirement
Are all sodium water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-8
Observation		
All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.		
Sampling for Sodium last occurred on September 16, 2019 and yielded a result of 17 mg/L.		
According to O.Reg. 170/03 - Schedule 13, subsection 13-8, sampling shall be carried out every		

sixty (60) months.

Question ID	MRDW1090000	
Question	Question Type	Legislative Requirement
Where fluoridation is not practiced, are all fluoride water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-9
Observation		
All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency.		
Sampling for Fluoride last occurred on September 16, 2019 and yielded a result of 0.21 mg/L.		
According to O.Reg. 170/03 - Schedule 13, subsection 13-9 sampling shall be carried out every sixty (60) months.		

Question ID	MRDW1100000	
Question	Question Type	Legislative Requirement
Did any reportable adverse/exceedance conditions occur during the inspection period?	Information	Not Applicable
Observation		
There were no reportable adverse/exceedances during the inspection period.		

Question ID	MRDW1113000	
Question	Question Type	Legislative Requirement
Have all changes to the system registration information been provided to the Ministry within ten (10) days of the change?	Legislative	SDWA O. Reg. 170/03 10.1 (3)
Observation		
All changes to the system registration information were provided within ten (10) days of the change.		

Question ID	MRDW1116000	
Question	Question Type	Legislative Requirement
Were the inspection questions sufficient to address other identified best practice issues?	BMP	Not Applicable
Observation		
The following issues were also noted during the inspection:		
It is recommended that the Drinking Water System Owner &/or Operating Authority consider		

acting on the following;

- 1.) Discussing the elevated ammonia concentrations identified in production well #1 with the local Health Unit prior to it being called into service.
- 2.) Determine where the floor drains and water from the exterior WW holding tank discharges to & ensure that any effluent is de-chlorinated before reaching the natural environment.
- 3.) Revising the O/M Manual to include a "Table of Contents" referencing where the Municipal License, Sch. B, Condition 16.0 - O/M Manual conditions can be located within, as well as the Contingency Plans, SOPs, and the new 2020 - Watermain Disinfection Procedure.
- 4.) Formalize internal efforts in writing taken to prevent falsification of training & log records
- 5.) Amend the current DWWP, Schedule A, Chlorine Addition section the next time amendments are being sought so as to remove reference to; Two (2) metering pumps (duty and standby) each capable of 4 L/hr. complete with one (1) storage tank for secondary disinfection
- 6.) Remove reference to the data obtained from the chlorine residual analyzer located near the bulk water fill station, incorrectly identified as a secondary chlorine unit (AIT 822).
- 7.) Revise ERP-02 - Raw Water Contamination, dated July 24, 2019, to include contacting MECP & local Health unit.
- 8.) Enhance the existing Emergency Contact List to include reference to Health unit, MECP, Equipment & Electrical Contractors & Suppliers,, Bulk Water Haulers & Hydro One for example.
- 9.) It is recommended that whenever numerical flow data is above the PTTW limit that staff capture the number of these event per 72 Reviews, and duration, where possible. Should the events be > 5 minutes in duration the O/A should capture, the number of events, the cause, where know, and actions taken to address, where applicable.

Question ID	MRDW1117000	
Question	Question Type	Legislative Requirement
Are there any other DWS related items that should be recognized in this report?	Information	Not Applicable
Observation		
The following items are noted as being relevant to the Drinking Water System:		
1.) Sampling efforts to comply with Permit To Take Water #5086-9BPM4A, Condition 4.2 as completed on behalf of the Owner by the Owner's Consultant - GeoKamp Limited yielded detections of toluene and xylene at low concentrations.		
An interpretive Report was prepared as required by GeoKamp Ltd, that was submitted to MECP for review.		

Additional sampling efforts were carried out subsequent to the initial detections (Dec. 2020), with the last most recent sampling event completed in September of 2021, with all repeatedly confirming the presence of low level concentrations of toluene and xylenes at two of the monitoring wells.

The Ministry's - Kingston District Office - Technical Support Services section was engaged although no definitive source of these chemical parameters could be identified.

A Permit To Take Water amendment is underway given the aforementioned and is expected address future sampling requirements, especially if continued or increasing concentrations of toluene & xylene are encountered.

2.) Data provided for review indicates that the raw water has been sampled & tested monthly as per regulatory requirements for turbidity.

Records indicate that over the inspection period, turbidity levels have ranged from 0.06 - 0.51 NTU.

3.) It is understood that the Township engaged GM BluePlan Engineering Limited to evaluate options in light of the ammonia concentrations identified within production well #1.

The report, entitled "Evaluation of Alternatives For Water Supply Upgrades" dated September 2019, identifies several options to include looking into the viability of utilizing one of the existing monitoring wells; having a new well constructed; installing different treatment options; using GAC media; blending from different sources; connecting to the Cobourg drinking water system or do nothing.

At the time of writing this report it has been reported that the Township of Alnwick/Haldimand have applied to the Ontario Community Infrastructure Fund for purposes of replacing Well #1 with a new production well.

It is expected that should funding be denied, then the matter will be taken back to council to re-evaluate options.

Question ID	MRDW1059000	
Question	Question Type	Legislative Requirement
Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?	Legislative	SDWA O. Reg. 128/04 28
Observation		
The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.		

Question ID	MRDW1061000	
Question	Question Type	Legislative Requirement
Are logbooks properly maintained and contain the required information?	Legislative	SDWA O. Reg. 128/04 27 (1), SDWA O. Reg. 128/04 27 (2), SDWA O. Reg. 128/04 27 (3), SDWA O. Reg. 128/04 27 (4), SDWA O. Reg. 128/04 27 (5), SDWA O. Reg. 128/04 27 (6), SDWA O. Reg. 128/04 27 (7)
Observation		
<p>Logbooks were properly maintained and contained the required information.</p> <p>Logbooks identified were large rectangular bound books, with the pages identified as "Waterworks Daily log Sheet" and the pages were numbered, & included locations, for operator details or logs, their names, times in/out, & location for operator's signatures.</p>		



APPENDIX A
RISK METHODOLOGY

APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS



The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection

results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains 15 inspection modules consisting of approximately 100 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

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The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system’s operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry’s annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario’s Risk Management Framework. Risk management is a systematic approach to identifying potential hazards, understanding the likelihood and consequences of the hazards, and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

$$\text{RISK} = \text{LIKELIHOOD} \times \text{CONSEQUENCE}$$

(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:	
Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:	
Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

Table 3 presents a sample question showing the risk rating determination process.

TABLE 3:							
Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?							
Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	Major Administrative Consequence	Minor Environmental Consequence	Minor Health Consequence	Medium Environmental Consequence	Major Environmental Consequence	Medium Health Consequence	Major Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely)	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely)	L=3 (Likely)	L=2 (Possible)
R=4	R=2	R=6	R=12	R=15	R=6	R=21	R=16

Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions related to regulatory compliance and input their “yes”, “no” or “not applicable” responses into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone); type of inspection (i.e., focused, detailed); and source type (i.e., groundwater, surface water).

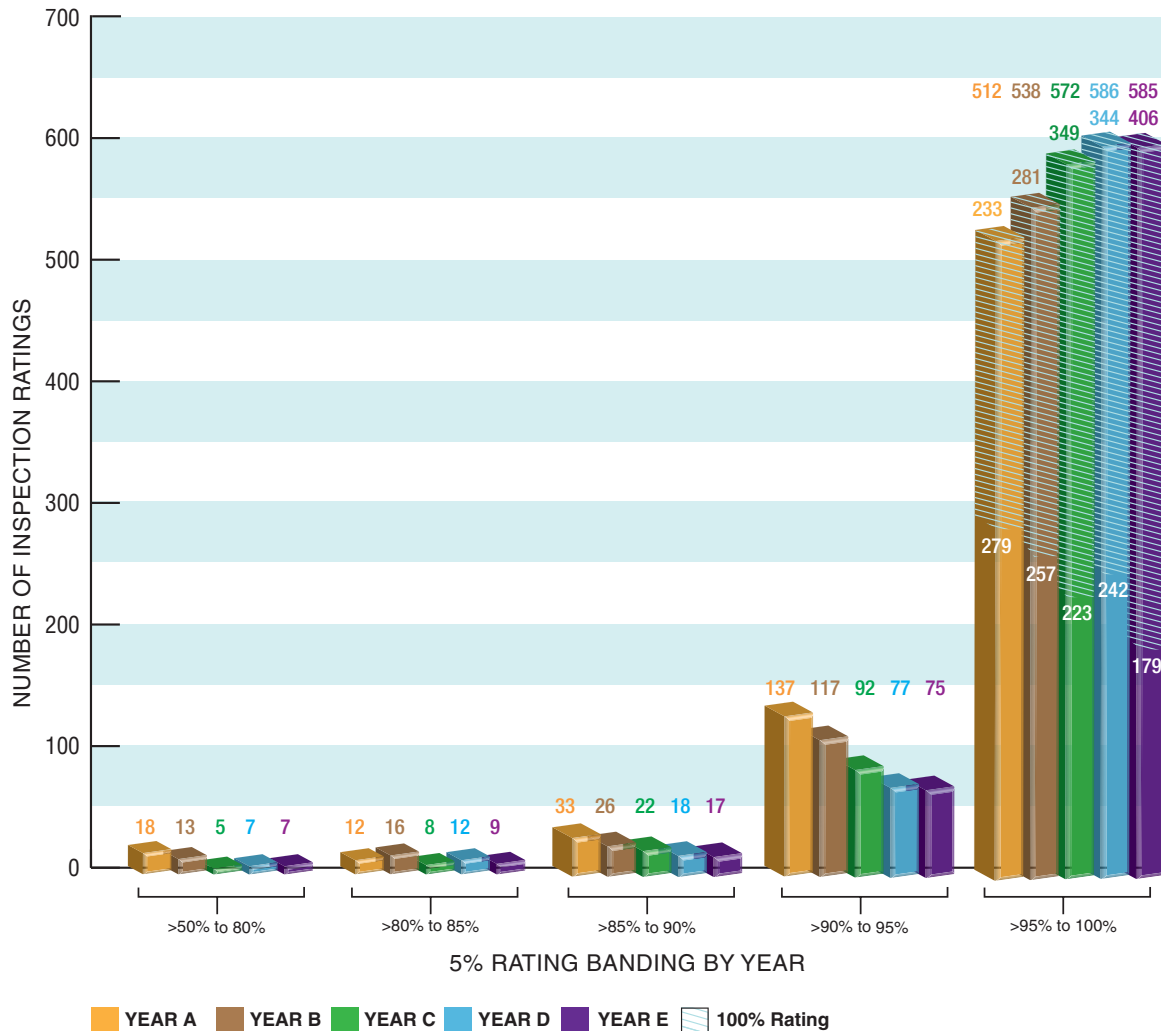
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

Figure 1 presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 15 possible modules of the inspection protocol,

which would provide the system owner/operator with information on the areas where they need to improve. The 15 modules are:

- | | | | |
|-------------------------|---------------------------------|--|--|
| 1. Source | 5. Treatment Process Monitoring | 9. Logbooks | 13. Water Quality Monitoring |
| 2. Permit to Take Water | 6. Process Wastewater | 10. Contingency and Emergency Planning | 14. Reporting, Notification and Corrective Actions |
| 3. Capacity Assessment | 7. Distribution System | 11. Consumer Relations | 15. Other Inspection Findings |
| 4. Treatment Processes | 8. Operations Manuals | 12. Certification and Training | |

For further information, please visit www.ontario.ca/drinkingwater

Ministry of the Environment, Conservation and Parks - Inspection Summary Rating Record (Reporting Year - 2021-2022)

DWS Name: Grafton Drinking Water System
DWS Number: 220009158
DWS Owner: THE CORPORATION OF THE TOWNSHIP OF ALNWICK-HALDIMAND
Municipal Location: ALNWICK-HALDIMAND

Regulation: O.REG. 170/03
DWS Category: DW Municipal Residential
Type of Inspection: Focused
Inspection Date: Nov-2-21
Ministry Office: Peterborough District Office

Maximum Risk Rating: 437

Inspection Module	Non Compliance Rating
Source	0 / 14
Capacity Assessment	0 / 30
Treatment Processes	0 / 168
Operations Manuals	0 / 28
Logbooks	0 / 18
Certification and Training	0 / 42
Water Quality Monitoring	0 / 112
Reporting & Corrective Actions	0 / 25
Overall - Calculated	0 / 437

Inspection Risk Rating: 0.00%

Final Inspection Rating: 100.00%

Ministry of the Environment, Conservation and Parks - Detailed Inspection Rating Record (Reporting Year - 2021-2022)

DWS Name: Grafton Drinking Water System
DWS Number: 220009158
DWS Owner Name: THE CORPORATION OF THE TOWNSHIP OF ALNWICK-HALDIMAND
Municipal Location: ALNWICK-HALDIMAND

Regulation: O.REG. 170/03
DWS Category: DW Municipal Residential
Type of Inspection: Focused
Inspection Date: Nov-2-21
Ministry Office: Peterborough District Office

All legislative requirements were met. No detailed rating scores.

Maximum Question Rating: 437

Inspection Risk Rating:	0.00%
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FINAL INSPECTION RATING:	100.00%
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