

PERMIT TO OPERATE

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 38

Date: **SEPTEMBER 23, 2015**

File No: **843.027.1**

Permit No: **OP-W-8306-2015**

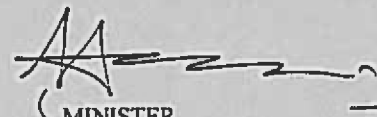
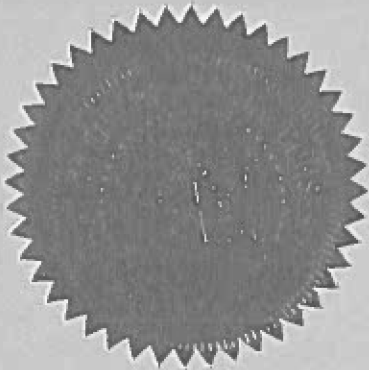
Permit Holder: **Town of Musgrave Harbour
PO Box 159
Musgrave Harbour NL A0G 3J0**

Attention: **Ms. Kim Osbourne**

Re: **Musgrave Harbour - Permit to Operate - Drinking Water System**

For the
operation of a: **Class II Water Treatment Plant
Class I Water Distribution System**

- This Permit is valid until Wednesday, September 23, 2020 or until there is a change in the classification of the **water treatment or water distribution system** as applicable, or as may be determined by this Department.
- This Permit does not release the Permit Holder from the obligation to obtain appropriate approvals from other concerned municipal, provincial and federal agencies.
- This Permit is subject to the terms and conditions indicated in Appendices A and B (attached).
- Failure to comply with the terms and conditions will render this Permit null and void, place the Permit Holder and their agent(s) in violation of the *Water Resources Act* and make the Permit Holder responsible for taking any remedial measures as may be prescribed by this Department.



MINISTER

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Conservation

File No: 843.027.1
Permit No: OP-W-8306-2015

APPENDIX A
Terms and Conditions for Permit

DW- General

1. The Owner shall operate and maintain a drinking water system which shall include the following:
 - a. a surface water supply from Rocky Pond;
 - b. a gravity fed raw water intake and 250 mm diameter transmission line to the treatment plant;
 - c. a packaged Degremont water treatment plant with a total maximum capacity of 2,180 m³/d, or 1,090 m³/d per treatment train, and including the following components:
 - pre-screening
 - pH adjustment
 - coagulation/flocculation with tube settler clarification
 - dual media filtration (anthracite and sand)
 - chlorine gas disinfection
 - d. a treated clear well with a volume of 275 m³;
 - e. lagoons for discharge of water treatment process residuals;
 - f. a water storage tank with a volume of 650 m³; and
 - g. a water distribution system including all appurtenances such as meters, valves including air/vacuum release and pressure regulating valves, hydrants etc., within the municipal boundary.
2. The Owner shall operate the drinking water system in accordance with any applicable regulations, policy, guidelines, and this approval, or as may be directed by the Department of Environment and Conservation. Water supplied to the consumer shall satisfy the requirements of the latest version of the *Guidelines for Drinking Water Quality in Newfoundland and Labrador*, the *Newfoundland and Labrador Microbiological Standards*, and the *Newfoundland and Labrador Disinfection Standards*.
3. The Owner shall ensure that all chemicals and materials used in the operation of the drinking water system that come into contact with water within the system shall meet all applicable standards set by both the American Water Works Association (AWWA) and the American National Standards Institute (ANSI) safety criteria standards NSF/60 or NSF/61.
4. The most current chemical and material product registration documentation from a testing institution accredited by either the Standards Council of Canada or by ANSI shall be available at all times for each chemical and material used in the operation of the drinking water system that comes into contact with water within the system.
5. The Owner shall practice a multi-barrier approach to protect the quality of drinking water from the source to the end of the water distribution system within the Owner's jurisdiction.
6. The Owner shall endeavour to take all necessary steps to ensure protection of the water supply source from contamination. The operators must establish and maintain a regular inspection routine to monitor activities within the water supply area.
7. The Owner shall ensure a copy of this Permit is kept in a conspicuous place so that it is available for reference by all persons responsible for all or part of the operation of the drinking water system.
8. The Owner shall maintain a sufficient inventory of spare parts for the most critical components of the drinking water system in order to keep downtime and disruptions to the system to a minimum. In particular, an adequate inventory of spare parts for the disinfection system must be maintained to ensure continuous disinfection.
9. The Owner shall develop and promote a water conservation program to reduce water demand on the drinking water system.
10. The Owner shall take preventative or corrective action as directed by this Department to address any identified deficiencies that may pose a risk to public health or the environment.

DW-Water Distribution

11. The Owner shall initiate a regular program for the inspection and cleaning of the source reservoir and intake screens as applicable.
12. The Owner shall initiate a regular flushing program for the distribution system. The system should be flushed on an annual basis, at minimum, and more frequently as conditions warrant.
13. The Owner shall initiate corrosion control measures if corrosion has been identified as an issue in the drinking water system.
14. The Owner shall put in place a cross connection control program with ongoing testing and maintenance of cross connection control

equipment. Special attention should be paid to existing and potential cross connections in the water distribution system such as bleed lines into manholes, unprotected watering stations, commercial and industrial establishments, and private water supplies.

15. The Owner shall ensure that repaired water mains are disinfected by an approved method such as described in the latest *Water Mains Standard for Disinfecting, C651* prepared by the American Water Works Association. The solution used for disinfecting water lines may not be discharged to a water course.
16. The Owner shall ensure that when dealing with asbestos cement pipe, any removal, handling or transport and disposal of asbestos must be carried out in accordance with the *Asbestos Abatement Regulations, 1998* under the *Occupational Health and Safety Act*. For further information, contact a Hazardous Materials Officer with Service NL, Occupational Health and Safety Division at (709)729-5536 or (709)729-7037.
17. Portable equipment must be provided for measuring chlorine residuals. The equipment shall have digital display readout, enable measurement of chlorine residuals to the nearest 0.02 mg/L, and shall be of a type approved by the Department of Environment and Conservation.
18. A minimum of two sites on the distribution system must be checked for residual disinfectant (free chlorine, total chlorine) on a daily basis. The sites must be situated at or near the first consumer on the system, and near the end(s) of the system for each independent system operated by the Owner within the Owner's jurisdiction. Residual disinfectant level must be recorded for each site along with date, time, location, and the record signed off by the operator. Measurement of water temperature, pH, turbidity, flow and pressure would also be desirable as part of this monitoring.
19. The Owner should establish an annual leak detection and repair program as a means to reduce unaccounted for water from the distribution system.
20. The Owner should establish a regular program for the inspection, exercising and maintenance of valves, hydrants and mechanical equipment according to manufacturer's recommendations.
21. The Owner, in consultation with the Medical Officer of Health, should issue a Boil Water Advisory (BWA) if conditions with the drinking water system meet any of the standard reasons for issuing a BWA as established by the province.

DW-Monitoring/Records/Reports

22. The Owner shall notify the Department of Environment and Conservation prior to implementing significant changes to any process that may adversely affect the quality and/or quantity of the finished water.
23. The Owner shall establish a maintenance and operation program that includes the following:
 - The Owner shall develop a Maintenance Assurance Manual (MAM) for their drinking water system as required by the Department of Municipal and Intergovernmental Affairs and this Department.
 - The Owner shall compile and maintain an up to date operations manual that is made available for reference by all persons responsible for all or part of the operation of the drinking water system. The manual must include manufacturer's information on all components of the system including supplier, contact information, specification information, shop drawings, model and serial numbers, date installed or date put into service, length of service, and parts inventory.
 - A maintenance schedule must be maintained for task specific items to be completed on a daily, weekly, monthly, and annual basis as may be applicable for the drinking water system.
 - An operator's daily log must be kept of items pertaining to the operation and maintenance of the drinking water system. All manual records should include date and time of record and the operator's signature.
24. The Owner shall ensure the continuous measurement and recording of:
 - a. Flow rates of water conveyed into individual treatment systems and trains, and the daily volumes of water conveyed into the individual treatment systems.
 - b. Flow rates and daily volumes of water conveyed to the distribution system from each treatment system that has a separate line feeding the distribution system.
 - c. Pressure at critical points in the distribution system, as applicable.
25. The Owner shall ensure that monitoring of raw and finished water quality (turbidity, pH, temperature, conductivity, aluminium residual, TOC, chlorine residual, etc.) is undertaken to ensure efficient operation of the water treatment plant.
26. The Owner shall maintain complete up to date digital and/or paper as-built drawings of the drinking water system including all major infrastructure components, process flow diagrams (PFDs), and process and instrumentation diagrams (P&IDs).
27. The Owner shall ensure that all process control monitoring instruments (including flow measuring devices, pressure sensors, level indicators, and water quality sensors) are maintained, calibrated and replaced in accordance with manufacturer's recommendations.
28. The Owner shall immediately report any major problems or malfunctions to the Design Approval Specialist by telephone at (709)729-2558 or by email at: waterandsewer@gov.nl.ca. A written report shall be submitted within seven days to the Department of Environment and Conservation.

29. The Owner shall notify consumers at the earliest possible time of malfunctions in the system. The Owner shall also provide advance notice of any planned disruptions for maintenance and repair, upgrading, and flushing, including anticipated duration and any other relevant information. The nature of the circumstance that will result in water quality deterioration must also be communicated to other concerned Departments, as applicable, including the Department of Health and Community Services, Municipal and Intergovernmental Affairs and Service NL.
30. The Owner shall establish procedures for receiving and responding to complaints including a reporting system which records what steps were taken to determine the cause of complaint and the corrective measures taken to alleviate the cause and prevent its reoccurrence.
31. The Owner shall produce an annual summary report documenting the operation and maintenance of the drinking water system, including as a minimum: daily water production, daily disinfectant residuals, amount of chemicals used, and any issues experienced with the distribution system (heavy rainfall, major leaks, water shortages, algae blooms, beavers in the water source, shutdown of water treatment equipment, etc.).
32. Any information requested by Department of Environment and Conservation officials concerning the drinking water system and its operation under this Permit, including but not limited to any records required to be kept by this permit, shall be provided to the Department upon request.
33. The Owner shall retain all records required by or created in accordance with this approval for a minimum of 5 years from the date of their creation.
34. The Owner shall establish long and short term plans for the sustainable operation of the drinking water system. Planning shall incorporate sound fiscal planning for all operational aspects of the system including general maintenance and operation, emergencies, operator training and continuing education, and capital fiscal planning for upgrading, expansion, and replacement.

DW-Disinfection

35. A summary of emergency procedures shall be posted outside the chlorine room.
36. The Owner shall monitor and document chlorine consumption on a daily basis.
37. Disinfection facilities should be kept at an adequate temperature to ensure the integrity of disinfection chemicals is not compromised.

DW-Water Treatment

38. The Owner shall operate the water treatment facility to treat water at a rate not exceeding the maximum flow rate of 2,180 m³/d (total) or 1,090 m³/d per treatment train.
39. The Owner shall only use the following chemicals in the treatment process, unless otherwise approved by this Department:
 - a. Chlorine gas
 - b. Aluminum sulphate
 - c. Coagulant polymer
 - d. Soda ash
40. The residuals effluent discharge from the treatment process to the lagoon(s) must be in compliance with the *Environmental Control Water and Sewage Regulations, 2003* and the *Canadian Water Quality Guidelines for the Protection of Aquatic Life*, as applicable.
41. The Owner shall ensure that access to the treatment plant is maintained year-round.
42. The Owner shall ensure that the treatment facility is reasonably secure from all unauthorized intrusions and shall maintain adequate security defences such as plant surveillance, adequate fencing and gates, and other measures as may be deemed necessary to prevent vandalism and unauthorized entry.
43. The Owner shall ensure the use of proper housekeeping techniques to keep the water treatment facility clean. All functioning components and housing structures shall be kept in good repair and well maintained.
44. The Owner shall ensure that all backflow prevention devices that are in use in the water treatment facility to prevent the backflow of contaminants into the potable water system are installed, maintained and tested on a regular basis by a certified installer and tester.
45. The Owner shall monitor and document filter rates, filter backwash rates, chemical dilutions, chemical feed rates, air flow rates and results from jar tests, as applicable.

DW-Operators

46. There shall be a person or persons designated by the Owner with the overall authority for the operation and maintenance of the water

treatment facility(ies) and water distribution system, respectively, the Operator in Direct Responsible Charge.

47. Sufficient staffing of Operators must be provided to carry out daily operation and maintenance activities on the drinking water system to ensure reliable operation of the system.
48. Operator(s) of the water treatment facility are required to have Class II Water Treatment Operator Certification status. This required level of certification must be achieved at the earliest possible opportunity, if not already achieved, not to exceed 4 years from the date of issue of this Permit. Certification must be achieved in accordance with the Operator education and experience requirements of the *Policy for Newfoundland and Labrador Water and Wastewater Operator Certification Program*. All Operators shall be permitted to certify to one level above that of the water treatment facility they operate.
49. Operator(s) of the water distribution system are required to have Class I Water Distribution Operator Certification status. These required levels of certification must be achieved at the earliest possible opportunity, if not already achieved, not to exceed 2 years from the date of issue of this Permit. Certification must be achieved in accordance with the Operator education and experience requirements of the *Policy for Newfoundland and Labrador Water and Wastewater Operator Certification Program*. All Operators shall be permitted to certify to one level above that of the water distribution system they operate.
50. Operators must receive a minimum of 24 hours of related training per year. The Owner shall ensure that Operators participate in training opportunities as they arise in order to meet this requirement.
51. Contractors who do work on the drinking water system on behalf of the Owner shall do so under the supervision of the Operator in Direct Responsible Charge and be trained in the particular aspect of the operation and maintenance that they have been contracted to do.

SCADA

52. Owners with automated Supervisory Control and Data Acquisition (SCADA) systems shall ensure the functionality of all Remote Terminal Units (RTUs)/ Programmable Logic Controllers (PLCs), Master Terminal Units (MTUs), Human Machine Interfaces (HMIs), data historian and trend applications, and communication systems on a daily basis.
53. The Owner will keep a backup copy of the SCADA system master database and the HMI. The backup copy may be located on a spare computer or MTU. Data collected by the SCADA system and stored on the MTU must be backed up on a regular basis.
54. The computer/MTU containing the SCADA system master database and HMI must be kept in a separate server room that can be locked. The MTU must never be turned off. The computer being used as the MTU shall be cleaned out with compressed air as required.
55. Multiple firewalls must be set up on the SCADA system if the Owner is to allow remote access/login to the SCADA system. Passwords used to gain access to different parts of the SCADA system must be changed on a regular basis.
56. The computer/MTU housing the SCADA system master database and HMI shall not be networked to the internet and shall not be used for sending/receiving emails or browsing the internet.
57. Automatic patches and updates for antivirus software and the computer operating system housing the SCADA system master database and HMI shall be disabled. All updates will be uploaded manually after confirmation from the update source that they will not interfere with the operation of the SCADA system.
58. The Owner shall maintain technical support for the SCADA system, which may include signing a maintenance support agreement with the developer. Updates to the SCADA system shall be installed as provided by the developer.
59. Network connections on the SCADA system must be identified and configured to prevent unauthorized access.
60. Logging services should be installed onto the SCADA system to track activity such as user log-on, user log-off, etc.

DW-Safety & Emergencies

61. The Owner shall ensure that all self-contained breathing apparatuses (SCBAs) are maintained as per the latest version of the CSA Standard for the *Selection, Use and Care of Respirators*. Air cylinders which have not been used in any 3-6 month period should be slowly depressurized and recharged with clean, dry, respirable air. The designated system operators must be trained in the use of the breathing apparatus.
62. The Owner shall ensure that all eye wash stations and emergency showers adhere to the latest edition of the ANSI Z358.1 standard and to the requirements of the applicable Materials Safety Data Sheet(s) (MSDS). Portable stations shall be checked regularly and the solutions replaced as required. Permanent stations should be flushed regularly to ensure an adequate and clean supply of potable water.
63. The Owner shall ensure the operation of emergency electrical generation or emergency pumping systems on a regular basis.

64. Operation of the drinking water system shall be conducted in accordance with the requirements of the *Occupational Health and Safety Act* and its regulations for the safety of operators and the general public. All safety requirements (handrails, guards, walkways, gas detectors, alarms, first aid equipment, emergency lighting, etc.) with respect to operation and maintenance of the drinking water system must be met.
65. The Owner shall ensure that operators are provided with all the safety clothing, equipment and training required to carry out hazardous activities. Hazards may include contact with sewage, dangerous chemicals and physical hazards such as confined space entry, climbing water storage tanks, buried power hazards, traffic, trenches, heights, etc. Servicing of all safety equipment must be undertaken according to the manufacturer's recommendations.
66. The Owner shall provide operators with access to suitable facilities for hand washing and cleaning, and shall provide disinfecting soap and cleaning products and services as may be necessary.
67. The Owner shall ensure that all used oil products and other related hazardous wastes generated by the machinery used in the operation of the drinking water system are collected and disposed of in an approved manner. The regional office of Service NL shall be contacted in this regard.
68. Emergency warning devices must be checked and exercised on a regular basis to ensure that all systems are operating and functioning properly. In particular, chlorine gas detectors should be tested on a monthly basis and calibrated every 6 months. A log shall be maintained to record the details of emergency warning device maintenance activity.
69. Contingency and emergency response plans must be established for all foreseeable what if scenarios such as extensive fire demand, main line breaks, contamination problems, or the SCADA system is hacked. Plans must include notification of all water system users. The Owner shall ensure that adequate equipment and material are available for dealing with emergencies, upset conditions and equipment breakdowns.
70. WHMIS and MSDS information will be kept on site where any chemicals are used in the operation of the drinking water system.

DW-Tanks

71. The Owner shall ensure that water storage tanks put back into service after cleaning or repairs shall be disinfected by an approved method such as described in the standard *Disinfection of Water Storage Facilities C652* prepared by the American Water Works Association. The solution used for disinfecting may not be discharged to a water course.
72. The Owner shall monitor and record the operational conditions of the water storage tank including the water level, time to fill/empty the tank, occurrence of overflows, occurrence of alarms, ice formation, and water quality in the tank as applicable. If necessary the Owner shall modify tank operating conditions in order to address any issues or optimize performance.
73. The Owner shall establish a preventative maintenance program for all water storage tanks outlining the frequency, procedures and maintenance of records for tank inspections. Routine tank inspections shall occur weekly, periodic inspections annually, and comprehensive inspections including tank cleaning at least every 5 years. Inspections shall assess tank sanitary, structural, safety, coatings and security conditions.
74. Vegetation around the outside of the tank shall be removed.

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Conservation

File No: 843.027.1
Permit No: OP-W-8306-2015

APPENDIX B
Special Terms and Conditions for Permit

1. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall keep all systems and works in good condition and repair and in accordance with all laws, by-laws, directions, rules and regulations of any governmental authority. The Permit Holder or its agent(s), subcontractor(s), or consultant(s) shall immediately notify the Minister if any problem arises which may threaten the structural stability of the systems and works, endanger public safety and/or the environment or adversely affect others and/or any body of water either in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for all damages suffered by the Minister and Government resulting from any defect in the systems and works, operational deficiencies/inadequacies, or structural failure.
2. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall operate the said Project and its systems and works in a manner which does not cause any water related and/or environmental problems, including but not limited to problems of erosion, deposition, flooding, and deterioration of water quality and groundwater depletion, in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for any and all damages associated with these problems caused as a result of changes, deficiencies, and inadequacies in the operational procedures by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
3. If the Permit Holder or its agent(s), subcontractor(s), or consultant(s) fails to perform, fulfil, or observe any of the terms and conditions, or provisions of this Permit and/or Ministerial orders and guidelines, as determined by this Department, the Minister may, after providing ten (10) day notice to the Permit Holder, amend, modify, suspend or cancel this Permit in accordance with the *Water Resources Act*.
4. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) indemnify and hold the Minister and Government harmless against any and all liabilities, losses, claims, demands, damages or expenses including legal expenses of any nature whatsoever whether arising in tort, contract, statute, trust or otherwise resulting directly or indirectly from granting this Permit, systems and works in or outside the said Project areas, or any act or omission of the Permit Holder or its agent(s), subcontractor(s), or consultant(s) in or outside the said Project areas, or arising out of a breach or non-performance of any of the terms and conditions, or provisions of this Permit by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
5. This Permit is subject to all provisions of the *Water Resources Act* and any regulations in effect either at the date of this Permit or hereafter made pursuant thereto or any other relevant legislation enacted by the Province of Newfoundland and Labrador in the future.
6. This Permit shall be construed and interpreted in accordance with the laws of the Province of Newfoundland and Labrador.

- cc: Mr. Haseen Khan, P. Eng.
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