Appendix A

MUNICIPAL DRINKING WATER LICENCE
DRINKING WATER WORKS PERMIT

Permit Number: 005-205
Issue Number: 2

Pursuant to the Safe Drinking Water Act, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this drinking water works permit is issued under Part V of the Safe Drinking Water Act, 2002, S.O. 2002, c. 32 to:

City of Hamilton

700 Woodward Ave
Hamilton
ON L8H 6P4

For the following municipal residential drinking water system:

Lynden Drinking Water System

This drinking water works permit includes the following:

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule A</td>
<td>Drinking Water System Description</td>
</tr>
<tr>
<td>Schedule B</td>
<td>General</td>
</tr>
<tr>
<td>Schedule C</td>
<td>All documents issued as Schedule C to this drinking water works permit which authorize alterations to the drinking water system</td>
</tr>
</tbody>
</table>

DATED at TORONTO this 30th day of May, 2014

Director
Part V, Safe Drinking Water Act, 2002
1.0 System Description

1.1 The following is a summary description of the works comprising the above drinking water system:

Overview

The Lynden Drinking Water System consists of one drinking water treatment plant, one well, one underground storage reservoir, a highlift pumping station and approximately 4.9 kilometers of distribution watermains.

Lynden Water Treatment Plant

Plant Location and System Type

<table>
<thead>
<tr>
<th>Street Address</th>
<th>3630 Governors Road, Lot 16, Concession 1, Hamilton, Ontario</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTM Coordinates</td>
<td>NAD83: UTM Zone 17: 4786865.00 m N, 570797.00 m E</td>
</tr>
<tr>
<td>System Type</td>
<td>Ground water supply and treatment</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>

Ground Water Supply

Well FDL01

<table>
<thead>
<tr>
<th>Description</th>
<th>200 mm diameter, 54.6 m deep drilled well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Part Lot 16, Concession 1, Ancaster, at 3630 Governors Road, 1.5 km east of Lynden Road</td>
</tr>
<tr>
<td>Well Pump</td>
<td>Submersible pump with a nominal capacity of 7.6 L/sec at 24 m Total Dynamic Head (TDH)</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>
## Treatment

### The Lynden FDL01 Treatment Building

<table>
<thead>
<tr>
<th>Description</th>
<th>A building with an underground reservoir, treatment equipment and standby power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Part Lot 16, Concession 1, Ancaster, at 3630 Governors Road, 1.5 km east of Lynden Road</td>
</tr>
<tr>
<td>Dimensions</td>
<td>9.1m x 6.9 m building over an underground reservoir</td>
</tr>
<tr>
<td>Notes</td>
<td>The treatment equipment including an aeration system, primary and secondary disinfection system using chorine. The reservoir is used for hydrogen sulfide removal and chlorine contact, highlift pumps and standby power.</td>
</tr>
</tbody>
</table>

### Storage Reservoir

<table>
<thead>
<tr>
<th>Description</th>
<th>A below ground, baffled two-cell reservoir, 278 m³ total capacity, equipped with three air headers/diffusers, and sodium hypochlorite injection point for primary disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>Aeration system consisting of two 18.75 kW blowers</td>
</tr>
</tbody>
</table>

### High Lift Works

### High Lift Pumps

<table>
<thead>
<tr>
<th>Description</th>
<th>Two vertical turbine pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>Each pump rated at a nominal capacity of 11.4 L/s at 70 m TDH</td>
</tr>
<tr>
<td>Discharge to</td>
<td>The Lynden Distribution System</td>
</tr>
<tr>
<td>Notes</td>
<td>One pressure district</td>
</tr>
</tbody>
</table>

### Chemical Addition

### Chlorine (Primary)

<table>
<thead>
<tr>
<th>Description</th>
<th>Primary disinfection using sodium hypochlorite solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed Point</td>
<td>400 mm diameter inlet pipe connecting two cells of the reservoir</td>
</tr>
<tr>
<td>Equipment</td>
<td>Three chemical pumps, one duty, two standby, two with a nominal capacity of 3.6 L/hr and one with a nominal capacity of 7.95 L/hr, one 200 L sodium hypochlorite storage tank serving both primary and secondary chemical pumps.</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>
Chlorine (Secondary)

<table>
<thead>
<tr>
<th>Description</th>
<th>Secondary disinfection system using sodium hypochlorite solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed Point</td>
<td>Highlift pump discharge header prior to distribution system</td>
</tr>
<tr>
<td>Equipment</td>
<td>Two chemical pumps, one duty one standby, each with a nominal capacity of 3.6 L/hr, one 200 L sodium hypochlorite storage tank serving both primary and secondary chemical pumps.</td>
</tr>
</tbody>
</table>

Instrumentation and Control

Flow

<table>
<thead>
<tr>
<th>Description</th>
<th>To measure well water and treated water flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>One downstream of the well flow control valve</td>
</tr>
<tr>
<td></td>
<td>One downstream of the highlift pumps</td>
</tr>
<tr>
<td>Equipment</td>
<td>Two flow meters</td>
</tr>
<tr>
<td>Notes</td>
<td>Continuous monitoring and recording</td>
</tr>
</tbody>
</table>

Free Chlorine

<table>
<thead>
<tr>
<th>Description</th>
<th>To monitor chlorine residual for primary and secondary disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>One after chorine contact prior to secondary chlorine addition</td>
</tr>
<tr>
<td></td>
<td>One at the entrance to distribution system</td>
</tr>
<tr>
<td>Equipment</td>
<td>Two free chlorine analyzers</td>
</tr>
<tr>
<td>Notes</td>
<td>Continuous monitoring, recording with alarms</td>
</tr>
</tbody>
</table>

SCADA System

<table>
<thead>
<tr>
<th>Description</th>
<th>Integrated process control and system monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>Supervisory control and data acquisition system</td>
</tr>
</tbody>
</table>

Emergency Power

Backup Power Supply

<table>
<thead>
<tr>
<th>Description</th>
<th>A 54 kW diesel generator set located in the treatment building.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>Supplies power to the well and processes inside the treatment building, complete with a 910 L fuel tank.</td>
</tr>
</tbody>
</table>

Watermains

1.2 Watermains within the distribution system comprise:

1.2.1 Watermains that have been set out in each document or file identified in column 1 of Table 1.
1.2.2 Watermains that have been added, modified, replaced or extended further to the provisions of Schedule C of this drinking water works permit on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

1.2.3 Watermains that have been added, modified, replaced or extended further to an authorization by the Director on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.
1.0 Applicability

1.1 In addition to any other requirements, the drinking water system identified above shall be altered and operated in accordance with the conditions of this drinking water works permit and the licence.

1.2 The definitions and conditions of the licence shall also apply to this drinking water works permit.

2.0 Alterations to the Drinking Water System

2.1 Any document issued by the Director as a Schedule C to this drinking water works permit shall provide authority to alter the drinking water system in accordance, where applicable, with the conditions of this drinking water works permit and the licence.

2.2 All Schedule C documents issued by the Director for the drinking water system shall form part of this drinking water works permit.

2.3 All parts of the drinking water system in contact with drinking water which are:

2.3.1 Added, modified, replaced, extended; or

2.3.2 Taken out of service for inspection, repair or other activities that may lead to contamination,

shall be disinfected before being put into service in accordance with the provisions of the AWWA C651 – Standard for Disinfecting Water Mains; AWWA C652 – Standard for Disinfection of Water-Storage Facilities; AWWA C653 – Standard for Disinfection of Water Treatment Plants; or AWWA C654 – Standard for Disinfection of Wells; or an equivalent procedure.

2.4 The owner shall notify the Director within thirty (30) days of the placing into service or the completion of any addition, modification, replacement or extension of the drinking water system which had been authorized through:

2.4.1 Schedule B to this drinking water works permit which would require an alteration of the description of a drinking water system component described in Schedule A of this drinking water works permit;

2.4.2 Any Schedule C to this drinking water works permit respecting works other than watermains; or
2.4.3 Any approval issued prior to the issue date of the first drinking water works permit respecting works other than watermains which were not in service at the time of the issuance of the first drinking water works permit.

2.5 For greater certainty, the notification requirements set out in condition 2.4 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

2.5.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03;

2.5.2 Constitutes maintenance or repair of the drinking water system; or

2.5.3 Is a watermain authorized by condition 3.1 of Schedule B of this drinking water works permit.

2.6 The owner shall notify the legal owner of any part of the drinking water system that is prescribed as a municipal drinking water system by section 2 of O. Reg. 172/03 of the requirements of the licence and this drinking water works permit as applicable to the prescribed system.

2.7 For greater certainty, any alteration to the drinking water system made in accordance with this drinking water works permit may only be carried out after other legal obligations have been complied with including those arising from the Environmental Assessment Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, 2001 and Greenbelt Act, 2005.

3.0 Watermain Additions, Modifications, Replacements and Extensions

3.1 The drinking water system may be altered by adding, modifying, replacing or extending a watermain within the distribution system subject to the following conditions:

3.1.1 The design of the watermain addition, modification, replacement or extension:

   a) Has been prepared by a Professional Engineer;

   b) Has been designed only to transmit water and has not been designed to treat water;

   c) Satisfies the design criteria set out in the Ministry of the Environment publication “Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – June 2012”, as amended from time to time; and

   d) Is consistent with or otherwise addresses, the design objectives contained within the Ministry of the Environment publication “Design Guidelines for Drinking Water Systems, 2008”, as amended from time to time.

3.1.2 The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system.
3.1.3 The watermain addition, modification, replacement or extension will not adversely affect the distribution system’s ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.

3.1.4 Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03.

3.1.5 The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction.

3.1.6 The owner of the drinking water system consents in writing to the watermain addition, modification, replacement or extension.

3.1.7 A Professional Engineer has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of condition 3.1.1.

3.1.8 The owner of the drinking water system has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of conditions 3.1.2 to 3.1.6.

3.2 The authorization for the addition, modification, replacement or extension of a watermain provided for in condition 3.1 does not include the addition, modification, replacement or extension of a watermain that:

3.2.1 Passes under or through a body of surface water, unless trenchless construction methods are used;

3.2.2 Has a nominal diameter greater than 750 mm;

3.2.3 Results in the fragmentation of the drinking water system; or,

3.2.4 Connects to another drinking water system, unless:

   3.2.4.1 Prior to construction, the owner of the drinking water system seeking the connection obtains written consent from the owner’s delegate of the other drinking water system being connected to; and,

   3.2.4.2 The owner of the drinking water system seeking the connection retains a copy of the written consent from the owner of the other drinking water system being connected to as part of the record that is recorded and retained under condition 3.3.

3.3 The verifications required in conditions 3.1.7 and 3.1.8 shall be:

3.3.1 Recorded on “Form 1 – Record of Watermains Authorized as a Future Alteration”, as published by the Ministry of the Environment, prior to the watermain addition, modification, replacement or extension being placed into service; and

3.3.2 Retained for a period of ten (10) years by the owner.
3.4 For greater certainty, the verification requirements set out in condition 3.3 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:

3.4.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

3.4.2 Constitutes maintenance or repair of the drinking water system.

3.5 The document or file referenced in Column 1 of Table 1 of Schedule A of this drinking water works permit that sets out watermains shall be retained by the owner and shall be updated to include watermain additions, modifications, replacements and extensions within 12 months of the addition, modification, replacement or extension.

3.6 The updates required by condition 3.5 shall include watermain location relative to named streets or easements and watermain diameter.

4.0 Minor Modifications to the Drinking Water System

4.1 The drinking water system may be altered by adding, modifying or replacing the following components in the drinking water system:

4.1.1 Raw water pumps and treatment process pumps in the treatment system;

4.1.2 Chemical metering pumps and chemical handling pumps;

4.1.3 Coagulant feed systems in the treatment system, including the location and number of dosing points;

4.1.4 Valves;

4.1.5 Instrumentation and controls, and software associated with these devices;

4.1.6 Filter media, backwashing equipment and under-drains in the treatment system;

4.1.7 Chemical storage tanks (excluding fuel storage tanks) and associated equipment; or

4.1.8 Spill containment works.

4.2 The drinking water system may be altered by adding, modifying, replacing or removing the following components in the drinking water system:

4.2.1 Treated water pumps and associated equipment;

4.2.2 Re-circulation devices within distribution system reservoirs and elevated tanks; or

4.2.3 Measuring and monitoring devices that are not required by regulation, by a condition in the Drinking Water Works Permit, or by a condition otherwise imposed by the Ministry of the Environment;

4.3 The drinking water system may be altered by replacing the following:
4.3.1 Raw water piping, treatment process piping or treated water piping within the treatment subsystem;

4.3.2 Fuel storage tanks and spill containment works, and associated equipment;

4.3.3 Coagulants and pH adjustment chemicals, where the replacement chemicals perform the same function;

   4.3.3.1 Prior to making any alteration to the drinking water system under condition 4.3.3, the owner shall undertake a review of the impacts that this alteration will have on corrosion control or other treatment processes; and

   4.3.3.2 The owner shall notify the Director in writing within thirty (30) days of any alteration made under condition 4.3.3 and shall provide the Director with a copy of the review.

4.4 Any alteration of the drinking water system made under conditions 4.1, 4.2, or 4.3 must not result in:

   4.4.1 An exceedance of a treatment subsystem rated capacity or a treatment subsystem component maximum flow rate as specified in the licence;

   4.4.2 The bypassing of any unit process within a treatment subsystem;

   4.4.3 A deterioration in the quality of drinking water provided to consumers;

   4.4.4 A reduction in the reliability or redundancy of any component of the drinking water system;

   4.4.5 A negative impact on the ability to undertake compliance and other monitoring necessary for operation of the drinking water system; or

   4.4.6 An adverse effect on the environment.

4.5 The owner shall verify in writing that the addition, modification, replacement or removal of drinking water system components in accordance with conditions 4.1, 4.2, and 4.3 has met the requirements of the conditions listed in condition 4.4.

4.6 The verifications and documentation required in condition 4.5 shall be:

   4.6.1 Recorded on “Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System”, as published by the Ministry of the Environment, prior to the modified or replaced components being placed into service; and

   4.6.2 Retained for a period of ten (10) years by the owner.

4.7 For greater certainty, the verification requirements set out in conditions 4.5 and 4.6 do not apply to any addition, modification, replacement or removal in respect of the drinking water system which:

   4.7.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or
4.7.2 Constitutes maintenance or repair of the drinking water system.

4.8 The owner shall update any drawings maintained for the drinking water system to reflect the modification or replacement of the works, where applicable.

5.0 Equipment with Emissions to the Air

5.1 The drinking water system may be altered by adding, modifying or replacing any of the following drinking water system components that may discharge or alter the rate or manner of a discharge of a compound of concern to the atmosphere:

5.1.1 Any equipment, apparatus, mechanism or thing that is used for the transfer of outdoor air into a building or structure that is not a cooling tower;

5.1.2 Any equipment, apparatus, mechanism or thing that is used for the transfer of indoor air out of a space used for the production, processing, repair, maintenance or storage of goods or materials, including chemical storage;

5.1.3 Laboratory fume hoods used for drinking water testing, quality control and quality assurance purposes;

5.1.4 Low temperature handling of compounds with a vapor pressure of less than 1 kilopascal;

5.1.5 Maintenance welding stations;

5.1.6 Minor painting operations used for maintenance purposes;

5.1.7 Parts washers for maintenance shops;

5.1.8 Emergency chlorine and ammonia gas scrubbers and absorbers;

5.1.9 Venting for activated carbon units for drinking water taste and odour control;

5.1.10 Venting for a stripping unit for methane removal from a groundwater supply;

5.1.11 Venting for ozone treatment units;

5.1.12 Natural gas or propane fired boilers, water heaters, space heaters and make-up air units with a total facility-wide heat input rating of less than 20 million kilojoules per hour, and with an individual fuel energy input of less than or equal to 10.5 gigajoules per hour; or

5.1.13 Emergency generators that fire No. 2 fuel oil (diesel fuel) with a sulphur content of 0.5 per cent or less measured by weight, natural gas, propane, gasoline or biofuel, and that are used for emergency duty only with periodic testing.

5.2 The owner shall not add, modify or replace a drinking water system component set out in condition 5.1 for an activity that is not directly related to the treatment and/or distribution of drinking water.
5.3 The emergency generators identified in condition 5.1.13 shall not be used for non-emergency purposes including the generation of electricity for sale or for peak shaving purposes.

5.4 The owner shall prepare an emission summary table for nitrogen oxide emissions only, for each addition, modification or replacement of emergency generators identified in condition 5.1.13.

Performance Limits

5.5 The owner shall ensure that a drinking water system component identified in conditions 5.1.1 to 5.1.13 is operated at all times to comply with the following limits:

5.5.1 For equipment other than emergency generators, the maximum concentration of any compound of concern at a point of impingement shall not exceed the corresponding point of impingement limit;

5.5.2 For emergency generators, the maximum concentration of nitrogen oxides at sensitive populations shall not exceed the applicable point of impingement limit, and at non-sensitive populations shall not exceed the Ministry of the Environment half-hourly screening level of 1880 µg/m³ as amended;

5.5.3 The noise emissions comply at all times with the limits set out in publication NPC-300, as applicable;

5.6 The owner shall verify in writing that any addition, modification or replacement of works in accordance with condition 5.1 has met the requirements of the conditions listed in condition 5.5.

5.7 The owner shall document how compliance with the performance limits outlined in 5.5.3 is being achieved, through noise abatement equipment and/or operational procedures.

5.8 The verifications and documentation required in condition 5.6 and 5.7 shall be:

5.8.1 Recorded on “Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere”, as published by the Ministry of the Environment, prior to the additional, modified or replacement equipment being placed into service.

5.8.2 Retained for a period of ten (10) years by the owner.

5.9 For greater certainty, the verification requirements set out in conditions 5.6 and 5.8 do not apply to any addition, modification or replacement in respect of the drinking water system which:

5.9.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

5.9.2 Constitutes maintenance or repair of the drinking water system.

5.10 The owner shall update any drawings maintained for the works to reflect the addition, modification or replacement of the works, where applicable.
6.0 Previously Approved Works

6.1 The owner may add, modify, replace or extend, and operate part of a municipal drinking water system if:

6.1.1 An approval was issued after January 1, 2004 under section 36 of the SDWA in respect of the addition, modification replacement or extension and operation of that part of the municipal drinking water system;

6.1.2 The approval expired by virtue of subsection 36(4) of the SDWA; and

6.1.3 The addition, modification, replacement or extension commenced within five years of the date that activity was approved by the expired approval.

7.0 System-Specific Conditions

7.1 None:

8.0 Source Protection

8.1 None
MUNICIPAL DRINKING WATER LICENCE

Licence Number: 005-105
Issue Number: 2

Pursuant to the Safe Drinking Water Act, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this municipal drinking water licence is issued under Part V of the Safe Drinking Water Act, 2002, S.O. 2002, c. 32 to:

City of Hamilton

700 Woodward Ave
Hamilton
ON L8H 6P4

For the following municipal residential drinking water system:

Lynden Drinking Water System

This municipal drinking water licence includes the following:

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<th>Schedule</th>
<th>Description</th>
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<tbody>
<tr>
<td>Schedule A</td>
<td>Drinking Water System Information</td>
</tr>
<tr>
<td>Schedule B</td>
<td>General Conditions</td>
</tr>
<tr>
<td>Schedule C</td>
<td>System-Specific Conditions</td>
</tr>
<tr>
<td>Schedule D</td>
<td>Conditions for Relief from Regulatory Requirements</td>
</tr>
<tr>
<td>Schedule E</td>
<td>Pathogen Log Removal / Inactivation Credits</td>
</tr>
</tbody>
</table>

DATED at TORONTO this 30th day of May, 2014

Signature

Indra R. Prashad, P.Eng.
Director
Part V, Safe Drinking Water Act, 2002
### Schedule A: Drinking Water System Information

<table>
<thead>
<tr>
<th>System Owner</th>
<th>City of Hamilton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licence Number</td>
<td>005-105</td>
</tr>
<tr>
<td>Drinking Water System Name</td>
<td>Lynden Drinking Water System</td>
</tr>
<tr>
<td>Schedule A Issue Date</td>
<td>May 30th, 2014</td>
</tr>
</tbody>
</table>

The following information is applicable to the above drinking water system and forms part of this licence:

#### Licence

<table>
<thead>
<tr>
<th>Licence Issue Date</th>
<th>2014-05-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licence Expiry Date</td>
<td>2019-05-29</td>
</tr>
<tr>
<td>Application for Licence Renewal Date</td>
<td>2018-11-27</td>
</tr>
</tbody>
</table>

#### Drinking Water Works Permit

<table>
<thead>
<tr>
<th>Drinking Water System Name</th>
<th>Permit Number</th>
<th>Issue Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynden Drinking Water System</td>
<td>005-205</td>
<td>May 30th, 2014</td>
</tr>
</tbody>
</table>

#### Permits to Take Water

<table>
<thead>
<tr>
<th>Water Taking Location</th>
<th>Permit Number</th>
<th>Issue Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynden Well FDL 01</td>
<td>2331-826QBK</td>
<td>March 23, 2010</td>
</tr>
</tbody>
</table>

#### Financial Plans

The Financial Plan Number for the Financial Plan required to be developed for this drinking water system in accordance with O. Reg. 453/07 shall be: 005-305

Alternately, if one Financial Plan is developed for all drinking water systems owned by the owner, the Financial Plan Number shall be: 005-301A

#### Accredited Operating Authority

<table>
<thead>
<tr>
<th>Drinking Water System or Operational Subsystems</th>
<th>Accredited Operating Authority</th>
<th>Operational Plan No.</th>
<th>Operating Authority No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynden Drinking Water System</td>
<td>City of Hamilton</td>
<td>005-405</td>
<td>005-OA1</td>
</tr>
</tbody>
</table>
1.0 Definitions

1.1 Words and phrases not defined in this licence and the associated drinking water works permit shall be given the same meaning as those set out in the SDWA and any regulations made in accordance with that act, unless the context requires otherwise.

1.2 In this licence and the associated drinking water works permit:

“adverse effect”, “contaminant” and “natural environment” shall have the same meanings as in the EPA;

“alteration” may include the following in respect of this drinking water system:

(a) An addition to the system,
(b) A modification of the system,
(c) A replacement of part of the system, and
(d) An extension of the system;

“compound of concern” means a contaminant that, based on generally available information, may be emitted from a component of the drinking water system to the atmosphere in a quantity that is significant either in comparison to the relevant point of impingement limit or if a point of impingement limit is not available for the compound, then based on generally available toxicological information, the compound has the potential to cause an adverse effect as defined by the EPA at a point of impingement;

“Director” means a Director appointed pursuant to section 6 of the SDWA for the purposes of Part V of the SDWA;

“drinking water works permit” means the drinking water works permit for the drinking water system, as identified in Schedule A of this licence and as amended from time to time;

“emission summary table” means the table that was prepared by a Professional Engineer in accordance with O. Reg. 419/05 and the procedure document listing the appropriate point of impingement concentrations of each compound of concern emitted from a component of the drinking water system and providing comparison to the corresponding point of impingement limit;

“EPA” means the Environmental Protection Act, R.S.O. 1990, c. E.19;
“financial plan” means the financial plan required by O. Reg. 453/07 and the conditions of this licence;

“licence” means this municipal drinking water licence for the municipal drinking water system identified in Schedule A of this licence;

“operational plan” means an operational plan developed in accordance with the Director’s Directions – Minimum Requirements for Operational Plans made under the authority of subsection 15(1) of the SDWA;

“owner” means the owner of the drinking water system as identified in Schedule A of this licence;

“permit to take water” means the permit to take water that is associated with the taking of water for purposes of the operation of the drinking water system, as identified in Schedule A of this licence and as amended from time to time;

“point of impingement” means any point in the natural environment that is not on the same property as the source of the contaminant and as defined by section 2 of O. Reg. 419/05;

“point of impingement limit” means the appropriate standard from Schedule 1, 2 or 3 of O. Reg. 419/05 and if a standard is not provided for a compound of concern, the appropriate criteria listed in the Ministry of the Environment publication titled “Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution – Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)”, dated February 2008, as amended;


“Professional Engineer” means a Professional Engineer who has been licenced to practice in the Province of Ontario;

“provincial officer” means a provincial officer appointed pursuant to section 8 of the SDWA;

“publication NPC-300” means the Ministry of the Environment publication titled “Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning” dated August 2013, as amended;


“sensitive populations” means any one or a combination of the following locations where the health effects of nitrogen oxides emissions from emergency generator(s) shall be considered using the point of impingement limit instead of the Ministry of the Environment screening level for emergency generator(s):

(a) health care units (e.g., hospitals and nursing homes),
(b) primary/junior public schools,
(c) day-care facilities, and
(d) playgrounds;

“subsystem” has the same meaning as in Ontario Regulation 128/04 (Certification of Drinking Water System Operators and Water Quality Analysts)

“surface water” means water bodies (lakes, wetlands, ponds - including dug-outs), water courses (rivers, streams, water-filled drainage ditches), infiltration trenches, and areas of seasonal wetlands.

2.0 Applicability

2.1 In addition to any other requirements, the drinking water system identified above shall be established, altered and operated in accordance with the conditions of the drinking water works permit and this licence.

3.0 Licence Expiry

3.1 This licence expires on the date identified as the licence expiry date in Schedule A of this licence.

4.0 Licence Renewal

4.1 Any application to renew this licence shall be made on or before the date identified as the application for licence renewal date set out in Schedule A of this licence.

5.0 Compliance

5.1 The owner and operating authority shall ensure that any person authorized to carry out work on or to operate any aspect of the drinking water system has been informed of the SDWA, all applicable regulations made in accordance with that act, the drinking water works permit and this licence and shall take all reasonable measures to ensure any such person complies with the same.

6.0 Licence and Drinking Water Works Permit Availability

6.1 At least one copy of this licence and the drinking water works permit shall be stored in such a manner that they are readily viewable by all persons involved in the operation of the drinking water system.
7.0 Permit to Take Water and Drinking Water Works Permit

7.1 A permit to take water identified in Schedule A of this licence is the applicable permit on the date identified as the Schedule A Issue Date.

7.2 A drinking water works permit identified in Schedule A of this licence is the applicable permit on the date identified as the Schedule A Issue Date.

8.0 Financial Plan

8.1 For every financial plan prepared in accordance with subsections 2(1) and 3(1) of O. Reg. 453/07, the owner of the drinking water system shall:

8.1.1 Ensure that the financial plan contains on the front page of the financial plan, the appropriate financial plan number as set out in Schedule A of this licence; and

8.1.2 Submit a copy of the financial plan to the Ministry of Municipal Affairs and Housing within three (3) months of receiving approval by a resolution of municipal council or the governing body of the owner.

9.0 Interpretation

9.1 Where there is a conflict between the provisions of this licence and any other document, the following hierarchy shall be used to determine the provision that takes precedence:

9.1.1 The SDWA;

9.1.2 A condition imposed in this licence that explicitly overrides a prescribed regulatory requirement;

9.1.3 A condition imposed in the drinking water works permit that explicitly overrides a prescribed regulatory requirement;

9.1.4 Any regulation made under the SDWA;

9.1.5 Any provision of this licence that does not explicitly override a prescribed regulatory requirement;

9.1.6 Any provision of the drinking water works permit that does not explicitly override a prescribed regulatory requirement;

9.1.7 Any application documents listed in this licence, or the drinking water works permit from the most recent to the earliest; and

9.1.8 All other documents listed in this licence, or the drinking water works permit from the most recent to the earliest.

9.2 If any requirement of this licence or the drinking water works permit is found to be invalid by a court of competent jurisdiction, the remaining requirements of this licence and the drinking water works permit shall continue to apply.
9.3 The issuance of and compliance with the conditions of this licence and the drinking water works permit does not:

9.3.1 Relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including the Environmental Assessment Act, R.S.O. 1990, c. E.18; and

9.3.2 Limit in any way the authority of the appointed Directors and provincial officers of the Ministry of the Environment to require certain steps be taken or to require the owner to furnish any further information related to compliance with the conditions of this licence or the drinking water works permit.

9.4 For greater certainty, nothing in this licence or the drinking water works permit shall be read to provide relief from regulatory requirements in accordance with section 46 of the SDWA, except as expressly provided in the licence or the drinking water works permit.

10.0 Adverse Effects

10.1 Nothing in this licence or the drinking water works permit shall be read as to permit:

10.1.1 The discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect; or

10.1.2 The discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters.

10.2 All reasonable steps shall be taken to minimize and ameliorate any adverse effect on the natural environment or impairment of the quality of water of any waters resulting from the operation of the drinking water system including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

10.3 Fulfillment of one or more conditions imposed by this licence or the drinking water works permit does not eliminate the requirement to fulfill any other condition of this licence or the drinking water works permit.

11.0 Change of Owner or Operating Authority

11.1 This licence is not transferable without the prior written consent of the Director.

11.2 The owner shall notify the Director in writing at least 30 days prior to a change of any operating authority identified in Schedule A of this licence.

11.2.1 Where the change of operating authority is the result of an emergency situation, the owner shall notify the Director in writing of the change as soon as practicable.
12.0 Information to be Provided

12.1 Any information requested by a Director or a provincial officer concerning the drinking water system and its operation, including but not limited to any records required to be kept by this licence or the drinking water works permit, shall be provided upon request.

13.0 Records Retention

13.1 Except as otherwise required in this licence or the drinking water works permit, any records required by or created in accordance with this licence or the drinking water works permit, other than the records specifically referenced in section 12 of O. Reg. 170/03, shall be retained for at least 5 years and made available for inspection by a provincial officer, upon request.

14.0 Chemicals and Materials

14.1 All chemicals and materials used in the alteration or 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, NSF/61, and NSF 372.

14.1.1 In the event that the standards are updated, the owner may use any on hand chemicals and materials that previously met the applicable standards.

14.1.2 The requirement for the owner to comply with NSF 372 shall come into force no later than June 3, 2016.

14.2 The most current chemical and material product registration documentation from a testing institution accredited by either the Standards Council of Canada or by the American National Standards Institution ("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.

14.3 Conditions 14.1 and 14.2 do not apply in the case of the following:

14.3.1 Water pipe and pipe fittings meeting AWWA specifications made from ductile iron, cast iron, PVC, fibre and/or steel wire reinforced cement pipe or high density polyethylene (HDPE);

14.3.2 Articles made from stainless steel, glass, HDPE or Teflon®;

14.3.3 Cement mortar for watermain lining and for water contacting surfaces of concrete structures made from washed aggregates and Portland cement;

14.3.4 Gaskets that are made from NSF approved materials;

14.3.5 Food grade oils and lubricants, food grade anti-freeze, and other food grade chemicals and materials that are compatible for drinking water use; or
14.3.6 Any particular chemical or material where the owner has written documentation signed by the Director that indicates that the Ministry of the Environment is satisfied that the chemical or material is acceptable for use within the drinking water system and the chemical or material is only used as permitted by the documentation.

15.0 Drawings

15.1 All drawings and diagrams in the possession of the owner that show any treatment subsystem as constructed shall be retained by the owner unless the drawings and diagrams are replaced by a revised or updated version showing the subsystem as constructed subsequent to the alteration.

15.2 Any alteration to any treatment subsystem shall be incorporated into process flow diagrams, process and instrumentation diagrams, and record drawings and diagrams within one year of the substantial completion of the alteration.

15.3 Process flow diagrams and process and instrumentation diagrams for any treatment subsystem shall be kept in a place, or made available in such a manner, that they may be readily viewed by all persons responsible for all or part of the operation of the drinking water system.

16.0 Operations and Maintenance Manual

16.1 An up-to-date operations and maintenance manual or manuals shall be maintained and applicable parts of the manual or manuals shall be made available for reference by all persons responsible for all or part of the operation or maintenance of the drinking water system.

16.2 The operations and maintenance manual or manuals, shall include at a minimum:

16.2.1 The requirements of this licence and associated procedures;

16.2.2 The requirements of the drinking water works permit for the drinking water system;

16.2.3 A brief description of the processes used to achieve primary and secondary disinfection within the drinking water system.

16.2.4 Procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing the performance of the drinking water system;

16.2.5 Procedures for the operation and maintenance of monitoring equipment;

16.2.6 Contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset conditions and equipment breakdown;

16.2.7 Procedures for dealing with complaints related to the drinking water system, including the recording of the nature of the complaint and any investigation and corrective action taken in respect of the complaint;
16.2.8 An inspection schedule for all wells associated with the drinking water system, including all production wells, standby wells, test wells and monitoring wells;

16.2.9 Well inspection and maintenance procedures for the entire well structure of each well including all above and below grade well components; and

16.2.10 Remedial action plans for situations where an inspection indicates non-compliance with respect to regulatory requirements and/or risk to raw well water quality.

16.3 Procedures necessary for the operation and maintenance of any alterations to the drinking water system shall be incorporated into the operations and maintenance manual or manuals prior to those alterations coming into operation.
1.0 Performance Limits

Rated Capacity

1.1 For each treatment subsystem listed in column 1 of Table 1, the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed the value identified as the rated capacity in column 2 of the same row.

<table>
<thead>
<tr>
<th>Treatment Subsystem Name</th>
<th>Column 2 Rated Capacity (m$^3$/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynden Water Treatment Plant</td>
<td>327</td>
</tr>
</tbody>
</table>

Maximum Flow Rates

1.2 For each treatment subsystem listed in column 1 of Table 2, the maximum flow rate of water that flows into a treatment subsystem component listed in column 2 shall not exceed the value listed in column 3 of the same row.

<table>
<thead>
<tr>
<th>Treatment Subsystem Name</th>
<th>Treatment Subsystem Component</th>
<th>Column 3 Maximum Flow Rate (L/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

1.3 Despite conditions 1.1 and 1.2, a treatment subsystem may be operated temporarily at a maximum daily volume and/or a maximum flow rate above the values set out in column 2 of Table 1 and column 3 of Table 2 respectively for the purposes of fighting a large fire or for the maintenance of the drinking water system.

1.4 Condition 1.3 does not authorize the discharge into the distribution system of any water that does not meet all of the requirements of this licence and all other regulatory requirements, including compliance with the Ontario Drinking Water Quality Standards.
Residue Management

1.5 In respect of an effluent discharged into the natural environment from a treatment subsystem or treatment subsystem component listed in column 1 of Table 3:

1.5.1 The annual average concentration of a test parameter identified in column 2 shall not exceed the value in column 3 of the same row; and

1.5.2 The maximum concentration of a test parameter identified in column 2 shall not exceed the value in column 4 of the same row.

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Subsystem or Treatment Subsystem Component Name</td>
<td>Test Parameter</td>
<td>Annual Average Concentration (mg/L)</td>
<td>Maximum Concentration (mg/L)</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

UV Disinfection Equipment Performance

1.6 For each treatment subsystem or treatment subsystem component listed in column 1 of Table 4:

1.6.1 The UV disinfection equipment shall be operated such that a continuous pass-through UV dose is maintained throughout the life time of the UV lamp(s) that is at least the minimum continuous pass-through UV dose set out in column 2 of the same row;

1.6.2 The UV disinfection equipment shall be operated within validated operating conditions;

1.6.3 The UV sensors shall be verified with a reference UV sensor according to the manufacturer’s recommended frequency, or otherwise at least once each month that the UV disinfection equipment is in operation;

1.6.4 The UV disinfection equipment shall be calibrated at least once every 12 months during which the drinking water system is in operation; and

1.6.5 For greater certainty, if condition 1.6.4 applies, the equipment shall be calibrated not more than 30 days after the first anniversary of the day the equipment was checked and calibrated in the previous 12-month period.
### Table 4: UV Disinfection Equipment Performance

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Subsystem or Treatment Subsystem Component Name</td>
<td>Minimum Continuous Pass-Through UV Dose (mJ/cm²)</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

#### 2.0 Flow Measurement and Recording Requirements

2.1 For each treatment subsystem identified in column 1 of Table 1 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:

2.1.1 The flow rate and daily volume of treated water that flows from the treatment subsystem to the distribution system.

2.1.2 The flow rate and daily volume of water that flows into the treatment subsystem.

2.2 For each treatment subsystem component identified in column 2 of Table 2 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:

2.2.1 The flow rate and daily volume of water that flows into the treatment subsystem component.

2.3 Where a rated capacity from Table 1 or a maximum flow rate from Table 2 is exceeded, the following shall be recorded:

2.3.1 The difference between the measured amount and the applicable rated capacity or maximum flow rate specified in Table 1 or Table 2;

2.3.2 The time and date of the measurement;

2.3.3 The reason for the exceedance; and

2.3.4 The duration of time that lapses between the applicable rated capacity or maximum flow rate first being exceeded and the next measurement where the applicable rated capacity or maximum flow rate is no longer exceeded.

#### 3.0 Calibration of Flow Measuring Devices

3.1 All flow measuring devices must be checked and calibrated in accordance with the manufacturer’s instructions.

3.2 If the manufacturer’s instructions do not indicate how often to check and calibrate a flow measuring device, the equipment must be checked and calibrated at least once every 12 months during which the drinking water system is in operation.
3.2.1 For greater certainty, if condition 3.2 applies, the equipment shall be checked and calibrated not more than 30 days after the first anniversary of the day the equipment was checked and calibrated in the previous 12-month period.

4.0 Additional Sampling, Testing and Monitoring

Drinking Water Health and Non-Health Related Parameters

4.1 For each treatment subsystem or treatment subsystem component identified in column 1 of Tables 5 and 6 and in addition to any other sampling, testing and monitoring that may be required, sampling, testing and monitoring shall be undertaken for a test parameter listed in column 2 at the sampling frequency listed in column 3 and at the monitoring location listed in column 4 of the same row.

Table 5: Drinking Water Health Related Parameters

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Subsystem or Treatment Subsystem Component Name</td>
<td>Test Parameter</td>
<td>Sampling Frequency</td>
<td>Monitoring Location</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Table 6: Drinking Water Non-Health Related Parameters

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Subsystem or Treatment Subsystem Component Name</td>
<td>Test Parameter</td>
<td>Sampling Frequency</td>
<td>Monitoring Location</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Environmental Discharge Parameters

4.2 For each treatment subsystem or treatment subsystem component identified in column 1 of Table 7 and in addition to any other sampling, testing and monitoring that may be required, sampling, testing and monitoring shall be undertaken for a test parameter listed in column 2 using the sample type identified in column 3 at the sampling frequency listed in column 4 and at the monitoring location listed in column 5 of the same row.

4.3 For the purposes of Table 7:

4.3.1 Manual Composite means the mean of at least three grab samples taken during a discharge event, with one sample being taken immediately following the commencement of the discharge event, one sample being taken approximately at the mid-point of the discharge event and one sample being taken immediately before the end of the discharge event; and

4.3.2 Automated Composite means samples must be taken during a discharge event by an automated sampler at a minimum sampling frequency of once per hour.
4.4 Any sampling, testing and monitoring for the test parameter Total Suspended Solids shall be performed in accordance with the requirements set out in the publication “Standard Methods for the Examination of Water and Wastewater”, 21st Edition, 2005, or as amended from time to time by more recently published editions.

<table>
<thead>
<tr>
<th>Table 7: Environmental Discharge Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column 1</td>
</tr>
<tr>
<td>Treatment Subsystem or Treatment Subsystem Component Name</td>
</tr>
<tr>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

4.5 Pursuant to Condition 10 of Schedule B of this licence, the owner may undertake the following environmental discharges, associated with the maintenance and repair of the drinking water system:

4.5.1 Discharge of potable water from watermains to roads or storm sewers;

4.5.2 Discharge of non-potable water from watermains, that has been dechlorinated, to roads or storm sewers;

4.5.3 Direct discharge of potable water from reservoirs, elevated tanks, storage tanks, and pumping stations

4.5.3.1 To roads or storm sewers; and

4.5.3.2 To a watercourse, where the discharge has been dechlorinated, and if necessary sediment and erosion control measures have been implemented.

4.5.4 Discharge of raw water from groundwater wells, where if necessary sediment and erosion control measures have been implemented.

4.5.5 Discharges of raw water or potable water from the treatment subsystem to the environment, where if necessary the discharge has been dechlorinated and sediment and erosion control measures have been implemented.

UV Disinfection Equipment

4.6 For each treatment subsystem or treatment subsystem component listed in column 1 of Table 8 and in addition to any other sampling, analysis and recording that may be required, continuous monitoring and recording with a minimum testing/reading and recording frequency of every four (4) hours shall be carried out for the test parameters set out in column 3 of the same row.
Table 8: UV Disinfection Equipment

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Subsystem or Treatment Subsystem Component Name</td>
<td>Control Strategy</td>
<td>Test Parameter</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

5.0 Studies Required

5.1 None

6.0 Source Protection

6.1 None
1.0 Lead Regulatory Relief

1.1 Any relief from regulatory requirements previously authorized by the Director in respect of the drinking water system under section 38 of the SDWA in relation to the sampling, testing or monitoring requirements contained in Schedule 15.1 of O. Reg. 170/03 shall remain in force until such time as Schedule 15.1 of O. Reg. 170/03 is amended after June 1, 2009.

2.0 Other Regulatory Relief

2.1 Notwithstanding the provisions of O. Reg. 170/03, amended by O.Reg 253/05 the Owner is not required to comply with the following:

- Record the minimum and maximum of test readings taken by a residual chlorine analyzer for a period of 5 minutes required in accordance with Schedule 6, section 6-5 (1) 2.i;

- Minimum alarm standard of 0.1 mg/L less than the concentration of free/combined chlorine residual that is required to achieve primary disinfection required by a residual analyzer measuring primary disinfection, in accordance with Schedule 6, section 6-5 (1) 5;

Conditions in exchange for relief from regulatory requirements

2.2 For the purposes testing, recording and setting alarms for continuous monitoring equipments required under Section 6-5 (1), the owner shall install chlorine residual analyzer, as follows:

- a chlorine residual analyzer that monitors primary disinfection:

- is capable of polling every 1 minute but averages the reading for every 5 minutes interval and records the reading;
- a "Low" alarm is set at 20% higher than the concentration of free/combined chlorine residual that is required to achieve primary disinfection;

- a “Low Low” alarm is set at the concentration of free/combined chlorine residual that is required to achieve primary disinfection and reported to MOE SAC as an “adverse reading”;

- a “High” alarm is set at 3 mg/L and a “High High” alarm is set at 4 mg/L

2.3 For the purpose Schedule 6, section 6-5 (1) 5, the following are considered as minimum alarm standards for the continuous monitoring equipment:

i. Minimum alarm standard required by a residual chlorine analyzer measuring primary disinfection is set at a concentration equal to free/combined chlorine residual that is required to achieve primary disinfection
Schedule E: Pathogen Log Removal/Inactivation Credits

System Owner | City of Hamilton
Licence Number | 005-105
Drinking Water System Name | Lynden Drinking Water System
Schedule D Issue Date | May 30th, 2014

1.0 Primary Disinfection Pathogen Log Removal/Inactivation Credits

Lynden Water Treatment Plant [GROUNDWATER]

<table>
<thead>
<tr>
<th>Log Removal/Inactivation Required</th>
<th>Cryptosporidium Oocysts</th>
<th>Giardia Cysts</th>
<th>Viruses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynden Water Treatment Plant</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Log Removal/Inactivation Credits Assigned</th>
<th>Cryptosporidium Oocysts</th>
<th>Giardia Cysts</th>
<th>Viruses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine Disinfection in below Ground Reservoir</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>