Report to Civic Works Committee

To: **Chair and Members**
Civic Works Committee
From: **Kelly Scherr, P.Eng., MBA, FEC**
Deputy City Manager, Environment & Infrastructure
Subject: **Greenway Organic Rankine Cycle Project – Connection Agreement with London Hydro**
Date: **July 27, 2021**

Recommendation

That, on the recommendation of the Deputy City Manager, Environment & Infrastructure, the following actions be taken with respect to the execution of a Connection Agreement with London Hydro for power generation at the Greenway Wastewater Treatment Plant:

a) The Connection Agreement provided by London Hydro for a Mid-Sized Embedded Generation Facility, **BE ACCEPTED**; and

b) the Mayor and City Clerk **BE AUTHORIZED** to execute any contract or other documents, if required, to give effect to these recommendations.

Executive Summary

Purpose

This report seeks the approval of Council to enter into an agreement with London Hydro for the connection of a new generating facility to the electrical distribution grid.

Context

The Organic Rankine Cycle system installed at Greenway Wastewater Treatment Plant constitutes a mid-sized embedded generation facility that requires a Connection Agreement to be executed as a condition of connection to the London Hydro local distribution grid.

Linkage to the Corporate Strategic Plan

This project supports the 2019-2023 Strategic Plan through the following: Building a Sustainable City, Build infrastructure to support future development and protect the environment.

Analysis

1.0 Background Information

1.1 Previous Reports Related to this Matter

Civic Works Committee, May 14, 2019, Item 2.7 – Contract Award: Tender T19-36: Greenway Organic Rankine Cycle Engine Installation.

Civic Works Committee, May 14, 2019, Item 2.10 – Greenway Wastewater Treatment Plant Organic Rankine Cycle Equipment Installation Budget Allocation.

Civic Works Committee, July 17, 2018, Item 2.6 – Clean Water and Wastewater Fund Project Budget Adjustments.

Civic Works Committee, June 7, 2017, Item 11 – Clean Water and Wastewater Fund – Purchase of Major Organic Rankine Cycle System Components for Power Generations at the Greenway Wastewater Treatment Plant.

Civic Works Committee, November 29, 2016, Item 11 – Appointment of Consultants – Clean Water and Wastewater Fund Projects.

Civic Works Committee, October 4, 2016, Item 8 – Infrastructure Canada Phase 1 Project Requests – Clean Water and Wastewater Fund Projects.

Civic Works Committee, July 18, 2016, Item 5 – Electricity Generation from Waste Heat at the Greenway Wastewater Treatment Plant-Update.

Civic Works Committee, September 9, 2013, Item 11 – Biosolids Disposal Assessment.

Civic Works Committee, February 25, 2013 – Timeline for major Environmental and Engineering Reports.

Civic Works Committee, May 14, 2012 – Renewable Energy Production from the Greenway Fluidized Bed Incinerator.

2.0 Discussion and Considerations

2.1 Organic Rankine Cycle Project History

The Organic Rankine Cycle installation at Greenway Wastewater Treatment Plant is currently being commissioned and is expected to commence producing power from waste heat within a month. The completion of this project represents the culmination of nine years of study, procurement, design and construction. Over this time, almost $18 million was invested by the City, leveraging Federal and Provincial funding through the Canadian Water and Wastewater Fund and the Federal Gas Tax.

It is expected that the power generated by the Organic Rankine Cycle system will be capable of offsetting a quarter of the power consumption at Greenway, the City's largest wastewater treatment plant, saving a projected $600,000 per year in electricity costs. The energy consumption reduction achieved through this project alone accounts for over 12% of the City's Corporate Energy Conservation and Demand Management Plan's overall target.

2.2 Connection Agreement with London Hydro

Despite the fact that all power produced by the Organic Rankine Cycle generator will be consumed at Greenway, the operation of an electricity generating system in parallel with the local distribution grid requires several studies to be completed, as well as the execution of an agreement with London Hydro.

This agreement, called the "London Hydro Form of Connection Agreement for a Small or a Mid-Sized Embedded Generation Facility", lays out several aspects of the

arrangement between the City and London Hydro, including design and operation of the facility, liabilities, insurance, access to site and dispute resolution terms, among other terms. Staff from Legal, Risk Management and Environment and Infrastructure Divisions have reviewed the agreement as provided by London Hydro and have no concerns with its terms. It is attached as Appendix 'A' to this report.

3.0 Financial Impact/Considerations

There are no financial considerations to this action.

Conclusion

The construction of the Organic Rankine Cycle power generation system at Greenway Wastewater Treatment Plant is the result of significant efforts on the part of City staff, consultants and contractors. It is a major achievement that contributes in a substantial way to corporate goals for energy reduction and greenhouse gas reduction. By executing the Connection Agreement with London Hydro, the City takes the final step required to implement these achievements. It is recommended that Council approve the execution of the Connection Agreement with London Hydro.

Prepared by:	**Kirby Oudekerk, P.Eng., Division Manager, Wastewater Treatment Operations**
Submitted by:	**Scott Mathers, MPA, P. Eng., Director, Water, Wastewater and Storm Water**
Recommended by:	**Kelly Scherr, P. Eng., MBA, FEC Deputy City Manager, Environment & Infrastructure**

CC: Aynsley Anderson, Legal Services
Jason Wills, Risk Management

300 Dufferin Avenue
P.O. Box 5035
London, ON
N6A 4L9

June 9, 2021

William A. Milroy, P.Eng.
London Hydro Inc.
111 Horton Street
London, ON N6A 4H6

Re: Connection Agreement for Greenway WWTP Organic Rankine Cycle System

Mr. Milroy,

In response to the requirement that the City enter into a Connection Agreement for a Mid-Sized Embedded Generation Facility for the Greenway Wastewater Treatment Plant Organic Rankine Cycle system, please be advised that only the Mayor and City Clerk have the authority to bind the corporation. However, timelines for the project do not allow that process to be completed prior to the expected commissioning date of June 15, 2021. As an interim measure, we understand that London Hydro is willing to permit the short-term operation of the generator upon receipt of an acceptance of the terms of the Connection Agreement by civic administration on the understanding that the agreement will be submitted for Council approval during the next committee/Council cycle.

To that end, please take this letter as confirmation that the civic administration of the City of London intends to present a report to Council, through the Civic Works Committee at its scheduled meeting on July 27, 2021, recommending that the Mayor and Clerk be delegated the authority to execute the Connection Agreement and bind the Corporation. The final approval, if granted, would be enacted by resolution of City Council as part of their scheduled meeting on August 10, 2021. It is understood that if final approval is not granted the generator will be required to cease operation.

As requested, this letter also confirms that the City carries the requisite $2,000,000 commercial general liability insurance, proof of which is attached hereto.

Sincerely,

Scott Mathers, MPA, P.Eng
Director,
Water, Wastewater, and Stormwater
City of London

LONDON HYDRO FORM OF CONNECTION AGREEMENT
FOR A SMALL OR A MID-SIZED EMBEDDED GENERATION FACILITY

This Connection Agreement is made this 14 day of June, 2021.

BETWEEN

London Hydro Inc. ("London Hydro") 111 Horton Street, London (Address)

AND

Corporation of City of London (the "Generator") 300 Dufferin Ave (Address)

(each a "Party" and collectively the "Parties")

RECITALS

WHEREAS London Hydro is the owner of the distribution system serving the service area as described in its electricity distribution license number RP-2002-0220/EB-2002-0557 (the "License") issued by the Ontario Energy Board (the "Board") (the "London Hydro's distribution system").

AND WHEREAS the Generator owns or operates a 965 kW embedded Biomass generation facility that is located at 109 Greenside Ave (Address)
(e.g. Solar, Wind, Biomass)

in the London Hydro licensed service area (the "Facility").

AND WHEREAS the Generator has connected or wishes to connect its Facility to the London Hydro distribution system and London Hydro has connected or has agreed to connect the Facility to the London Hydro distribution system.

AND WHEREAS London Hydro has previously reviewed and accepted the Generator's application to connect and related materials that were submitted to London Hydro in accordance with the process set out in the Distribution System Code (the "Code") (all together, the "Application") and London Hydro and the Generator have signed a connection cost agreement (both of which are attached to this Agreement as Schedule A).

AND WHEREAS the Generator has requested a connection in accordance with its License and the Code, London Hydro has agreed to offer, and the Generator has agreed to accept, distribution service in relation to the Facility.

NOW THEREFORE in consideration of the foregoing, and of the mutual covenants, agreements, terms and conditions herein contained, the Parties, intending to be legally bound, hereby agree as follows:

1. Definitions and Schedules

1.1 Words and phrases contained in this Agreement (whether capitalized or not) that are not defined in this Agreement have the meanings given to them in the *Electricity Act, 1998*, the *Ontario Energy Board Act, 1998*, any regulations made under either of those *Acts*, or the Code.

1.2 The following schedules form part of this Agreement:

Schedule A – Application and Connection Cost Agreement (recitals)

Schedule B – Single Line Diagram, Connection Point, Location of Facilities (section 2.3)

Schedule C – List of Other Contracts (section 3.4)

Schedule D – Technical and Operating Requirements (section 4.1(d))

Schedule E – Billing and Settlement Procedures (section 5.3)

Schedule F – Contacts for Notice (section 12.1)

Schedule G – Dispute Resolution (section 16.1)

Schedule H – Provisions Applicable if Facility Financed by a Lender (sections 19.3, 20.3 and 21.1)

Where a schedule is to be completed by the Parties, the Parties may not include in that schedule a provision that would be contrary to or inconsistent with the Code or the remainder of this Agreement.

2. Type of Facility

2.1 The Facility has a name-plate rated capacity of

☒ more than 10 kW and:

(a) up to and including 500 kW, if the Facility is or will be connected to a less than 15 kV line; or

(b) up to and including 1 MW, if the Facility is or will be connected to a 15 kV or greater line

(in which case the Facility is a “Small Embedded Generation Facility”) .

☐ 10 MW or less and:

(a) more than 500 kW, if the Facility is or will be connected to a less than 15 kV line; or

(b) more than 1 MW, if the Facility is or will be connected to a 15 kV or greater line

(in which case the Facility is a "Mid-sized Embedded Generation Facility")

2.2 The Facility is or will be connected:

- ☐ directly to the London Hydro distribution system
- ☒ on the load customer side of a connection point to the London Hydro distribution system.
  - ☒ the load customer is the same as the Generator
  - ☐ the load customer is: _____

2.3 Schedule B sets out the following:

(a) a single line diagram of the Facility;
(b) a list of the facilities of one Party that are on the property of the other Party; and
(c) a diagram of the metering installations applicable to the Facility.

2.4 The Generator:

- ☐ is an "Embedded Retail Generator" and intends to:
  - ☐ sell output from the Facility to the Independent Electricity System Operator and has entered into an agreement with the Independent Electricity System Operator for that purpose; or
  - ☐ deliver and / or sell output from the Facility to London Hydro
- ☒ does not intend to sell any of the output of the Facility to the Independent Electricity System Operator or London Hydro

3. Incorporation of Code and Application of Conditions of Service and Other Contracts

3.1 The Code, as it may be amended from time to time, is hereby incorporated in its entirety by reference into, and forms part of this Agreement. Unless the context otherwise requires, all references to "this Agreement" include a reference to the Code.

3.2 London Hydro hereby agrees to be bound by and at all times to comply with the Code, and the Generator acknowledges and agrees that London Hydro is bound at all times to comply with the Code in addition to complying with the provisions of this Agreement.

3.3 In addition to this Agreement, the relationship between London Hydro and the

Generator will be governed by London Hydro's Conditions of Service that are in effect at the relevant time. In the event of a conflict or an inconsistency between a provision of this Agreement and a provision of London Hydro's Conditions of Service, the provision of this Agreement shall govern.

3.4 London Hydro may require or may have already required the Generator to enter into one or more of the other contracts listed in Schedule C. In the event of a conflict or an inconsistency between a provision of the Code or this Agreement and a provision of such other contract, the provision of the Code or this Agreement shall govern.

4. Facility Standards

4.1 The Generator shall ensure that the Facility:

(a) meets all applicable requirements of the Electrical Safety Authority ("ESA");
(b) conforms to all applicable industry standards including, but not limited to, those of the Canadian Standards Association ("CSA"), the Institute of Electrical and Electronic Engineers ("IEEE"), the American National Standards Institute ("ANSI") and the International Electrotechnical Commission;
(c) is installed, constructed, operated and maintained in accordance with this Agreement, London Hydro's offer to connect, the requirements of the ESA, the connection cost agreement, all applicable reliability standards and good utility practice; and
(d) meets the technical and operating requirements set out in Schedule D. These requirements shall not exceed any technical or operating requirements set out in the Code unless the Generator agrees.

5. Charges, Settlement and Billing

5.1 The Generator shall pay London Hydro such charges as may be approved by the Board in relation to the connection of, and the provision of distribution service to, the Facility.

5.2 The Generator agrees to the following in relation to settlement for the output of the Facility:

☒ if the Generator is not an Embedded Retail Generator (see section 2.4)

London Hydro will not pay the Generator for any excess generation that results in a net delivery to London Hydro between meter reads and there will be no carryover of excess generation from one billing period to the next, unless the Generator is at the relevant time a *net metered* generator

☐ if the Generator is an Embedded Retail Generator (see section 2.4)

London Hydro will settle all applicable payments and charges in accordance with the Retail Settlement Code

5.3. Billing and settlement activities will be conducted in accordance with the procedures set out in Schedule E.

6. Representations, Warranties and Liabilities

6.1 The Generator represents and warrants to London Hydro as follows, and acknowledges that London Hydro is relying on such representations and warranties without independent inquiry in entering into this Agreement:

(a) the Facility is fully and accurately described in the Application;
(b) all information in the Application is true and correct;
(c) the Facility is in compliance with all applicable technical requirements and laws;
(d) the Generator has been given warranty information and operation manuals for the Facility;
(e) the Generator has been adequately instructed in the operation and maintenance of the Facility and the Generator has developed and implemented an operation and maintenance plan based on those instructions;
(f) if the Generator is a corporation or other form of business entity, the Generator is duly incorporated, formed or registered (as applicable) under the laws of its jurisdiction of incorporation, formation or registration (as applicable);
(g) the Generator has all necessary power, authority and capacity to enter into this Agreement and to perform its obligations under this Agreement;
(h) this Agreement constitutes a legal and binding obligation on the Generator, enforceable against the Generator in accordance with its terms;
(i) the Generator holds all permits, licenses and other authorizations that may be necessary to enable it to own and operate the Facility; and
(j) any individual signing this Agreement on behalf of the Generator has been duly authorized by the Generator to sign this Agreement and has the full power and authority to bind the Generator.

6.2 London Hydro represents and warrants to the Generator as follows, and acknowledges that the Generator is relying on such representations and warranties without independent inquiry in entering into this Agreement:

(a) London Hydro is duly incorporated under the laws of Ontario;
(b) London Hydro has all necessary power, authority and capacity to enter into this Agreement and to perform its obligations under this Agreement;
(c) this Agreement constitutes a legal and binding obligation on London

Hydro, enforceable against London Hydro in accordance with its terms; and

(d) any individual signing this Agreement on behalf of London Hydro has been duly authorized by London Hydro to sign this Agreement and has the full power and authority to bind London Hydro.

7. Disconnection Device at the Point of Connection

7.1 The Generator shall furnish and install a disconnection switch at the point of connection for the Facility that opens, with a visual break, all ungrounded poles of the connection circuit. The disconnection switch at the point of connection shall be rated for the voltage and fault current requirements of the Facility, and shall meet all applicable CSA standards, ESA requirements, and all other applicable laws. The switch enclosure, if applicable, shall be properly grounded.

7.2 The disconnection switch at the point of connection shall be accessible at all times, located for ease of access to the London Hydro personnel, and shall be capable of being locked in the open position. The Generator shall follow London Hydro's procedures for switching, clearance, tagging, and locking.

8. Modifications to the Facility

8.1 The Generator shall not modify its connection assets or the Facility except in accordance with this section. Where the modification will not increase the maximum generation electrical output of the Facility, the Generator shall give London Hydro no less than 15 working day's notice prior to the date on which the modification will be completed.

8.2 Where the modification will increase the maximum generator electrical output of the Facility, the Generator shall submit a new application for connection to London Hydro who shall process that application for connection in accordance with the Code. The Generator shall not commence such modification until that process has been completed.

9. Insurance

9.1 Throughout the term of this Agreement, the Generator shall carry commercial general liability insurance for third party bodily injury, personal injury, and property damage in an amount as follows:

- ☒ if the Facility is a Small Embedded Generation Facility (see section 2.1) not less than $1,000,000 per occurrence and in the annual aggregate
- ☐ if the Facility is a Mid-sized Embedded Generation Facility (see section 2.1) not less than $2,000,000 per occurrence and in the annual aggregate

Prior to execution of this Agreement, the Generator shall provide London Hydro with a valid certificate of insurance. The Generator shall provide London Hydro with prompt notice of any cancellation of the Generator's insurance by the insurer.

10. Liability and Force Majeure

10.1 The liability provisions of section 2.2 of the Code apply to this Agreement and are hereby incorporated by reference into, and form part of, this Agreement.

10.2 A Party shall have a duty to mitigate any losses relating to any claim for indemnification from the other Party that may be made in relation to that other Party. Nothing in this section shall require the mitigating Party to mitigate or alleviate the effects of any strike, lockout, restrictive work practice or other labour dispute.

10.3 A Party shall give prompt notice to the other Party of any claim with respect to which indemnification is being or may be sought under this Agreement.

10.4 The force majeure provisions of section 2.3 of the Code apply to this Agreement and are hereby incorporated by reference into, and form part of, this Agreement.

11. Facility Commissioning and Testing

11.1 The Generator shall give London Hydro at least 15 days advance written notice of the date(s) and time(s) on which the Facility will be commissioned and tested prior to connection. The Generator shall give London Hydro the same notice in relation to the commissioning and testing of any material modification to the Generator's connection assets or Facility that occurs after connection.

11.2 London Hydro shall have the right to witness the commissioning and testing activities referred to in section 11.1.

12. Notice

12.1 Any notice, demand, consent, request or other communication required or permitted to be given or made under or in relation to this Agreement shall be given or made: by courier or other personal form of delivery; by registered mail; by facsimile; or by electronic mail. Notices shall be addressed to the applicable representative of the Party identified in Schedule F.

12.2 A notice, demand, consent, request or other communication referred to in section 12.1 shall be deemed to have been made as follows:

(a) where given or made by courier or other form of personal delivery, on

the date of receipt;

(b) where given or made by registered mail, on the date of receipt;

(c) where given or made by facsimile, on the day and at the time of transmission as indicated on the sender's facsimile transmission report; and

(d) where given or made by electronic mail, on the day and at the time when the notice, demand, consent, request or other communication is recorded by the sender's electronic communications system as having been received at the electronic mail destination.

13. Access to Facility

13.1 Each Party shall ensure that its facilities are secured at all times.

13.2 The Generator shall permit and, if the land on which the Facility is located is not owned by Generator, cause such landowner to permit London Hydro's employees and agents to enter the property on which the Facility is located at any reasonable time. Such access shall be provided for the purposes of inspecting and/or testing the Facility as and when permitted by this Agreement, the Code or the London Hydro Conditions of Service or as required to ensure the continued safe and satisfactory operation of the Facility, to ensure the accuracy of London Hydro's meters, to establish work protection, or to perform work.

13.3 Any inspecting and/or testing referred to in section 13.2 shall not relieve the Generator from its obligation to operate and maintain the Facility and any related equipment owned by the Generator in a safe and satisfactory operating condition and in accordance with this Agreement.

13.4 London Hydro shall have the right to witness any testing done by the Generator of the Facility and, to that end, the Generator shall provide London Hydro with at least fifteen working days advance notice of the testing.

13.5 Notwithstanding section 10.1, where London Hydro causes damage to the Generator's property as part of this access, London Hydro shall pay to the Generator the Generator's reasonable costs of repairing such property or, if such property cannot be repaired, replacing such property.

13.6 Notwithstanding section 10.1, if the Generator has been given access to London Hydro's property, and if the Generator causes damage to London Hydro's property as part of that access, the Generator shall pay to London Hydro reasonable costs of repairing such property or, if such property cannot be repaired, replacing such property.

14. Disconnection of Facility for System Operations

14.1 If the Generator requests it, the Distributor will provide the Generator with reasonable notice of any planned equipment outages in the Distributor's distribution system that occur on or after the date of the Generator's request which will impact the Facility or its connection.

14.2 The Distributor will make reasonable efforts to ensure that the outages referred to in section 14.1 will be of minimal duration and cause minimal inconvenience to the Generator.

14.3 In connection with any planned equipment outage, either Party may disconnect or isolate, or require the disconnection or isolation of, its Facility or distribution system (as applicable) from the other Party's Facility or distribution system (as applicable) so that the employees, contractors or agents of either Party may construct, maintain, repair, replace, remove, investigate, inspect or operate its own Facility or distribution system (as applicable) in accordance with the terms of this Agreement and good utility practice.

14.4 Where practical, the Generator shall notify London Hydro prior to temporarily isolating or disconnecting the Facility from the London Hydro distribution system.

15. Disconnection of Facility for Other Reasons

15.1 The Generator shall discontinue operation of the Facility and London Hydro may isolate or disconnect the Facility from the London Hydro distribution system, upon any of the following:

(a) termination of this Agreement in accordance with section 19;
(b) if the Generator's connection assets or the Facility are modified by the Generator in a manner contrary to section 8.1;
(c) during an emergency or where necessary to prevent or minimize the effects of an emergency;
(d) in accordance with section 31, 31.1 or 40(5) of the *Electricity Act, 1998*, other applicable law, the Code, the London Hydro License or the London Hydro Conditions of Service; or
(e) where required to comply with a decision or order of an arbitrator or court made or given under Schedule G.

15.2 In the event of disconnection under section 15.1(b), the Facility shall remain isolated or disconnected from the London Hydro distribution system until the connection process referred to in section 8.1 has been completed.

15.3 In the event of disconnection under section 15.1(c), London Hydro shall reconnect, or permit the reconnection of the Facility to London Hydro's distribution system when it is reasonably satisfied that the emergency has ceased and that all other requirements of this Agreement are met.

15.4 In the event of disconnection under section 15.1(d) or 15.1(e), London Hydro shall reconnect, or permit the reconnection of the Facility to London Hydro's distribution system when London Hydro is reasonably satisfied that the reason for the disconnection no longer exists, the Generator agrees to pay all Board-approved reconnection costs charged by London Hydro, and London Hydro is reasonably satisfied of the following, where applicable:

(a) the Generator has taken all necessary steps to prevent the circumstances that caused the disconnection from recurring and has delivered binding undertakings to London Hydro that such circumstances shall not recur; and
(b) any decision or order of a court or arbitrator made or given under Schedule G that requires a Party to take action to ensure that such circumstances shall not recur has been implemented and/or assurances have been given to the satisfaction of the affected Party that such decision or order will be implemented.

15.5 Where the Facility has been isolated or disconnected, each Party shall be entitled to decommission and remove its assets associated with the connection. Each Party shall, for that purpose, ensure that the other Party has all necessary access to its site at all reasonable times.

15.6 The Generator shall continue to pay for distribution services provided up to the time of isolation or disconnection of its Facility.

15.7 The Generator shall pay all reasonable costs including, but not limited to, the costs of removing any of the London Hydro equipment from the Generator's site, that are directly attributable to the isolation or disconnection of the Facility and, where applicable, the subsequent decommissioning of the Facility. London Hydro shall not require the removal of the protection and control wiring on the Generator's site.

15.8 While the Facility is isolated or disconnected, London Hydro shall not be required to convey electricity to or from the Facility.

16. Dispute Resolution

16.1 Any dispute between the Generator and London Hydro arising under, or in relation to this Agreement will be resolved in accordance with Schedule G. The Parties shall comply with the procedure set out in Schedule G before taking any civil or other proceeding in relation to the dispute, provided that nothing shall prevent a Party from seeking urgent or interlocutory relief from a court of competent jurisdiction in the Province of Ontario in relation to any dispute arising under or in relation to this Agreement.

17. Amendments

17.1. The Parties may not amend this Agreement without leave of the Board except where and to the extent permitted by this Agreement.

17.2. The Parties may by mutual agreement amend this Agreement to reflect changes that may from time to time be made to the Code during the term of this Agreement.

17.3. The Parties may by mutual agreement amend any portion of a schedule that was originally to be completed by the Parties.

17.4 No amendment made under section 17.2 or 17.3 shall be contrary to or inconsistent with the Code or the remainder of this Agreement.

17.5 The Parties shall amend this Agreement in such manner as may be required by the Board.

17.6 Any amendment to this Agreement shall be made in writing and duly executed by both Parties.

18. Waiver

18.1 A waiver of any default, breach or non-compliance under this Agreement is not effective unless in writing and signed by the Party to be bound by the waiver. The waiver by a Party of any default, breach or non-compliance under this Agreement shall not operate as a waiver of that Party's rights under this Agreement in respect of any continuing or subsequent default, breach or non-compliance, whether of the same or any other nature.

19. Term of Agreement and Termination

19.1 This Agreement shall become effective upon execution by the Parties, and shall continue in effect until terminated in accordance with section 19.2 or 19.3.

19.2 The Generator may, if it is not then in default under this Agreement, terminate this Agreement at any time by giving London Hydro thirty days prior written notice setting out the termination date.

19.3 Except as set out in Schedule H, London Hydro may terminate this Agreement upon any material breach of this Agreement by the Generator (a "Default"), if the Generator fails to remedy the Default within the applicable cure period referred to in section 19.4 after receipt of written notice of the Default from London Hydro.

19.4 The Generator shall cure a Default within the applicable cure period specified

in the Code or the London Hydro Conditions of Service. If no such cure period is specified in relation to a given Default, the cure period shall be sixty working days.

19.5 Termination of this Agreement for any reason shall not affect:

(a) the liabilities of either Party that were incurred or arose under this Agreement prior to the time of termination; or
(b) the provisions that expressly apply in relation to disconnection of the Generator's facilities following termination of this Agreement.

19.6 Termination of this Agreement for any reason shall be without prejudice to the right of the terminating Party to pursue all legal and equitable remedies that may be available to it including, but not limited to, injunctive relief.

19.7 The rights and remedies set out in this Agreement are not intended to be exclusive but rather are cumulative and are in addition to any other right or remedy otherwise available to a Party at law or in equity. Nothing in this section 19.7 shall be interpreted as affecting the limitations of liability arising from section 10.1 or the obligation of a Party to comply with section 16 while this Agreement is in force.

19.8 Sections 19.5 to 19.7 shall survive termination of this Agreement.

20. Exchange and Confidentiality of Information

20.1 Confidential information in respect of a Party means (i) information disclosed by that Party to the other Party under this Agreement that is in its nature confidential, proprietary or commercially sensitive and (ii) information derived from the information referred to in (i), but excludes the following:

(a) information that is in the public domain; or
(b) information that is, at the time of the disclosure, in the possession of the receiving Party, provided that it was lawfully obtained from a person under no obligation of confidence in relation to the information.

20.2 Subject to section 20.3, each Party shall treat all confidential information disclosed to it by the other Party as confidential and shall not, without the written consent of that other Party:

(a) disclose that confidential information to any other person; or
(b) use that confidential information for any purpose other than the purpose for which it was disclosed or another applicable purpose contemplated in this Agreement.

Where a Party, with the written consent of the other Party, discloses confidential information of that other Party to another person, the Party shall

take such steps as may be required to ensure that the other person complies with the confidentiality provisions of this Agreement.

20.3 Nothing in section 20.2 shall prevent the disclosure of confidential information:

(a) where required or permitted under this Agreement, the Code, the Market Rules or the London Hydro License;
(b) where required by law or regulatory requirements;
(c) where required by order of a government, government agency, regulatory body or regulatory agency having jurisdiction;
(d) if required in connection with legal proceedings, arbitration or any expert determination relating to the subject matter of this Agreement, or for the purpose of advising a Party in relation thereto;
(e) as may be required to enable London Hydro to fulfill its obligations to any reliability organization; or
(f) as may be required during an emergency or to prevent or minimize the effects of an emergency.

20.4 Notwithstanding section 10.1, a Party that breaches section 20.2 shall be liable to the other Party for any and all losses of the other Party arising out of such breach.

20.5 The Parties agree that the exchange of information, including, but not limited to, confidential information, under this Agreement is necessary for maintaining the reliable operation of London Hydro's distribution system. The Parties further agree that all information, including, but not limited to, confidential information, exchanged between them shall be prepared, given and used in good faith and shall be provided in a timely and cooperative manner.

20.6 Each Party shall provide the other with such information as the other may reasonably require to enable it to perform its obligations under this Agreement.

20.7 Each Party shall, as soon as practicable, notify the other Party upon becoming aware of a material change or error in any information previously disclosed to the other Party under this Agreement and, in the case of the Generator, in any information contained in its Application. The Party shall provide updated or corrected information as required to ensure that information provided to the other Party is up to date and correct.

21. Assignment, Successors and Assigns

21.1 Except as set out in Schedule H, the Generator shall not assign its rights or obligations under this Agreement in whole or in part without the prior written consent of London Hydro, which consent shall not be unreasonably withheld or unduly delayed. London Hydro may withhold its consent to any proposed assignment until the proposed assignee assumes, in writing, all of the

Generator's obligations contained in this Agreement.

21.2 London Hydro shall have the right to assign this Agreement in whole upon written notification to the Generator.

21.3 This Agreement shall be binding upon and enure to the benefit of the Parties and their respective successors and permitted assigns.

22. Governing Law

22.1 This Agreement shall be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein.

23. Entire Agreement

23.1 Except as expressly provided herein, this Agreement constitutes the entire agreement between the Parties with respect to the subject-matter hereof and supersedes all prior oral or written representations and agreements of any kind whatsoever with respect to the subject-matter hereof.

IN WITNESS WHEREOF, the Parties hereto, intending to be legally bound, have caused this Agreement to be executed by their duly authorized representatives.

PER:_____ _____
Date (dd/mm/yyyy)

~~I have authority to bind the corporation.~~

LONDON HYDRO INC.

PER:_____ _____

William A. Milroy, P. Eng., VP Engineering and Operations
I have authority to bind the corporation.

Date (dd/mm/yyyy)

I acknowledge that this agreement will be recommended by the Civic Administration and submitted to Council during the next committee/Council cycle.

Scott Mathers

I acknowledge that the attached Connection Agreement details the agreed to terms, which will be followed, for the Operation of the Organic Rankine Cycle generator located at 109 Greenside Ave. It is my understanding that the entirety of this Agreement will be recommended for submission and approval by Council during the next committee/ Council cycle.

Greg Sheil, P.Eng.
Manager of Standards & Generation
London Hydro

SCHEDULE A

Application and Connection Cost Agreement (recitals)

See the attached CIA Application, CIA Summary Report, Offer to Connect Letter and ESA Certificate.

Attach the Connection Impact Assessment Form filled by the Generator, and any other relevant information with respect to the Generator's application to connect.

Connection Impact Assessment Application Form

This Application Form is for Generators applying for a Connection Impact Assessment (CIA). In certain circumstances, London Hydro may require additional information to conduct the Impact Assessment. Should this be the case the Generator will be duly advised.

This Application Form is required for:

- **New Generators applying for Connection Impact Assessment ("CIA")**
- **New Generators applying for revision to their original Connection Impact Assessment ("CIA")**
- **Existing Generators to verify information related to current connection to the London Hydro system. It is part of the overall Distribution Connection Agreement.**

NOTES:

1. **Applicants and generators are cautioned NOT to incur major expenses until London Hydro has completed a Connection Impact Assessment (CIA) study and approval to connect the proposed generation is granted.**
2. **All fields below are mandatory, except where noted. Incomplete applications may be returned by London Hydro Inc. ("London Hydro").**
3. **All technical submissions (Connection Impact Assessment, single line diagrams, etc.) must be signed and sealed by a licensed Ontario Professional Engineer (P.Eng.).**

Date: 11/12/2018 (dd / mm / yyyy) Contact Person Name: ROBERT TREMBLAY
Signature:

Application Type: ☒ New CIA Application ☐ CIA Revision/Rework

LICENSED PROFESSIONAL ENGINEER
R. J. TREMBLAY
Dec. 11/18
PROVINCE OF ONTARIO

LDC Name:	**LONDON HYDRO INC.**
Contact Person:	**Dane Kirilovic**
Mailing Address:	**111 Horton Street, P.O. Box 2700**
	London, ON, N6A 4H6
Telephone:	**519-661-5800 ext. 5723**
Fax:	**519-661-5275**
E-mail:	**generation@londonhydro.com**

1. **Original CIA Project ID# (if applicable):** _____ **Project Name:** GREENWAY WASTEWATER TREATMENT PLANT ORC ENERGY REVCOVERY SYSTEM
2. **Project Type:** ☐ **FIT** ☐ **Net Metering** ☒ **Load Displacement**
3. **Independent Electricity System Operator (IESO) Feed-In Tariff (FIT) #:** N/A
4. **Project Dates:** Proposed Start of Construction: 20/05/2019 (dd/mm/yyyy) (estimated dates)
   Proposed In-Service: 25/05/2020 (dd/mm/yyyy)
5. **Project Size:** Nameplate Capacity 960 kW
6. **Project Location:** Municipal Address 109 GREENSIDE AVE LONDON, ON N6J 2X5

7. Project Information:

Choose a Single Point of Contact: ☐ Owner ☒ Consultant

	Generator *(Mandatory)*	Owner *(Mandatory)*	Consultant *(Optional)*
Company/Person	CORPORATION OF THE CITY OF LONDON	CORPORATION OF THE CITY OF LONDON	GHD LTD
Contact Person	MARK ELLIOTT	MARK ELLIOTT	ROBERT TREMBLAY
Mailing Address Line 1	109 GREENSIDE AVE	109 GREENSIDE AVE	455 Phillip St
Mailing Address Line 2	LONDON, ON N6J 2X5	LONDON, ON N6J 2X5	Waterloo, ON N2L 3X2
Telephone	519-963-1366	519-963-1366	519-340-3881
Cell	226-927-5287	226-927-5287	519-240-2861
Fax	519-661-0199	519-661-0199	
E-mail	melliott@london.ca	melliott@london.ca	robert.tremblay@ghd.com

Preferred method of communication with London Hydro: ☒ E-mail ☐ Telephone ☐ Mail ☐ Fax

8. Customer Status:

Billing Account Number: 6263701

Customer name registered to this Account: GREENWAY PCC - CITY OF LONDON

Are you a HST registrant? ☒ Yes ☐ No

If yes, provide your HST registration number: 119420883 RT 0001

9. Fuel Type:

☐ Wind Turbine ☐ Hydraulic Turbine ☐ Steam Turbine ☐ Solar/ Photovoltaic
☐ Diesel Engine ☐ Gas Turbine ☐ Fuel Cell ☐ Biomass
☐ Co-generation/CHP (Combined Heat & Power) ☐ Bio-diesel
☐ Anaerobic Digester ☐ Battery
☒ Other (Please Specify) ORGANIC RANKIN CYCLE TURBINE, (Thermal vaporised Oil)

10. Please provide a sketch of your proposed point of connection to London Hydro distribution system.

Drawing / Sketch No. 8811165-E010, Rev 4

11. Connection to London Hydro's Distribution System (provided in your original IFA):

a. Proposed connection voltage to London Hydro's distribution system: 4.16kV at PCC. (LV side of LH owned 27.6kV:4.16kV transformer)
b. Feeder Name: 26M54
c. Hydro One Transformer Station Name: TALBOT TS
d. GPS coordinates of the connection point 42°58'28.6"N, 81°16'52.5"W
e. Fault contribution from Generator's facilities, with the fault location at the PCC:
   ☒ Three-phase generators: 3-phase short circuit 8.5 (approx) MVA; Shall be verified based on the short circuit study report.
   ☐ Single-phase generators: 1-phase short circuit _____ MVA.

12. Single Line Diagram (SLD):

Provide detailed and updated SLD of the EG facility including the Demarcation Point / Point of Common Coupling ("PCC") to London Hydro's distribution system. This drawing shall include, but not be limited to:

- Electrical equipment at EG's facilities, their principal ratings, impedances, winding configurations, neutral grounding methods, etc.
- Protective relaying, synchronizing and revenue metering arrangements. The device numbers should be in accordance with those adopted in the ANSI / IEEE Standard C37.2 – 1979: *IEEE Standard Electrical Power System Device Function Numbers.*

The SLD shall include the following, as applicable:

- Disconnecting device at the connection point with London Hydro's distribution system
- Load break switches
- Fuses
- Circuit breakers
- Interface step-up transformer
- Intermediate transformer(s)
- CTs and VTs (quantity, location, connection, ratio)
- Generators (rotating / static)
- Power factor correction capacitors and their switching arrangements (particularly for induction units)
- Motors
- Power cables
- Surge arresters
- Any other relevant electrical equipment.

- SLD Drawing Number: 8811165-E010 Rev. 4

13. Generator Characteristics

a. Characteristics of Existing Generators

If Generator's facilities include existing generators, provide details as an attached document. N/A

b. Characteristics of New Generators:

NOTE:
Please provide the manufacturer's technical data (electrical) for the generator or inverter.

Number of generating unit(s): 1
Manufacturer / Type or Model No: NIDEC / LSA 50.2 L8 / 4P
Rated capacity of each unit: 960 kW 1200 kVA
If unit outputs are different, please fill in additional sheets to provide the information.
Rated frequency: 60 Hz
Rotating Machine Type:
☒ Synchronous ☐ Induction ☐ Inverter ☐ Other (Please Specify) _____
(If the machine type is "Other", please provide values equivalent to a Synchronous or Induction type Generator)
Generator connecting on: ☐ single phase ☒ three phase

Limits of range of reactive power at the machine output:
i. Lagging (over-excited): 720 kVAR power factor 0.8
ii. Leading (under-excited) 480 kVAR power factor -0.9
Limits of range of reactive power at the PCC:
iii. Lagging (over-excited): _____ kVAR power factor _____
iv. Leading (under-excited) _____ kVAR power factor _____

Starting inrush current: _____ pu (multiple of full load current)
Generator terminal connection: ☐ delta ☒ star
Neutral grounding method of star connected generator:
☐ Solid ☐ Ungrounded ☐ Impedance: R 17.3 ohms X _____ ohms
☒ Resistance

For Synchronous Units:

i. Nominal machine voltage: .6 kV
ii. Minimum power limit for stable operation: 960 kW
iii. Unsaturated reactances on: 1200 kVA base .6 kV base
Direct axis subtransient reactance, Xd" 0.116 pu
Direct axis transient reactance, Xd' 0.136 pu
Direct axis synchronous reactance, Xd 2.52 pu
Zero sequence reactance, X0 0.005 pu
iv. Provide a plot of generator capability curve (MW output vs MVAR)
Document Number: 609243, Sheet 8 of 11, Rev. 1

For Induction Units:

i. Nominal machine voltage: _____ kV
ii. Unsaturated reactances on: _____ kVA base _____ kV base
Direct axis subtransient reactance, Xd" _____ pu
Direct axis transient reactance, Xd' _____ pu
iii. Total power factor correction installed: _____ kVAR
- Number of regulating steps _____
- Power factor correction switched per step _____ kVAR
- Power factor correction capacitors are automatically switched off when generator breaker opens

☐ Yes ☐ No

For SPC / Inverter type units:

i. Terminal voltage _____ V
ii. Line - interactive type (i.e. intended for parallel operation with electric utility) ☐ Yes ☐ No
iii. Power factor _____p.u.
iv. Battery backup provided ☐ Yes ☐ No
v. Maximum fault current for terminal faults _____A
vi. Standards according to which built _____
vii. Provide Manufacturer's technical brochure and specification sheet _____ Doc. No

14. Interface Step-Up Transformer Characteristics:

a. Transformer ownership: ☐ Customer / ☒ London Hydro
b. Transformer rating: 5000 kVA
c. Nominal voltage of high voltage winding: 27.6 kV
d. Nominal voltage of low voltage winding: 4.16 kV
e. Transformer type: ☐ single phase ☒ three phase
f. Impedances on: Z= 5% _____ kVA base _____ kV base
R: _____ pu, X: _____ pu
g. High voltage winding connection: ☒ delta ☐ star
Grounding method of star connected high voltage winding neutral:
☐ Solid ☐ Ungrounded ☐ Impedance: R: _____ ohms X: _____ ohms
Nameplate rating and impedance values of High Voltage Grounding Transformer (If applicable):
Voltage:_____ V Rating: _____KVA R:_____ pu X:_____pu

h. Low voltage winding connection: ☐ delta ☒ star
Grounding method of star connected low voltage winding neutral:
☒ Solid ☐ Ungrounded ☐ Impedance: R: _____ ohms X: _____ ohms

NOTE:

- The term 'High Voltage' refers to the connection voltage to London Hydro's distribution system and 'Low Voltage' refers to the generation or any other intermediate voltage.

15. Intermediate Transformer Characteristics (if applicable):

a. Transformer rating: 1500 kVA
b. Nominal voltage of high voltage winding: 4.16 kV
c. Nominal voltage of low voltage winding: .6 kV
d. Transformer type: ☐ single phase ☒ three phase
e. Impedances on: Z= 5% (assumed) _____ kVA base _____ kV base
R _____ pu X _____ pu
f. High voltage winding connection: ☐ delta ☒ star
Grounding method of star connected high voltage winding neutral:
☒ Solid ☐ Ungrounded ☐ Impedance: R _____ ohms X _____ ohms
g. Low voltage winding connection: ☒ delta ☐ star
Grounding method of star connected low voltage winding neutral:
☐ Solid ☐ Ungrounded ☐ Impedance: R _____ ohms X _____ ohms

NOTE: The term 'High Voltage' refers to the intermediate voltage that is input to the interface step-up transformer and the 'Low Voltage' refers to the generation voltage.

16. Load information: BASED ON YEARLY DATA FROM LONDON HYDRO & 4160 NOMINAL VOLTAGE

a. Maximum load of the facility: 3967 kVA 3694 kW
b. Maximum load current (referred to the nominal voltage at the connection point to London Hydro's system): 953 A
c. Maximum inrush current to loads (referred to the nominal voltage at the connection point to London Hydro's system): _____ A NOT AVAILABLE

Attached Documents:

Item No.	Description	Document No.	No. of Pages
1			
2			
3			

Attached Drawings:

Item No.	Description	Document No.	No. of Pages
1			
2			
3			

CHECKLIST
Please ensure the following items are completed prior to submission. The application shall be returned if incomplete:

- ☐ Completed form stamped by a Professional Engineer
- ☐ Signed Study Agreement along with payment listed in the Study Agreement
- ☐ Single Line Diagram (SLD) of the Generator's facilities, must be stamped by a Professional Engineer

NOTE:

By submitting a completed CIA application, the Proponent authorizes the collection by London Hydro Inc. ("London Hydro"), of any agreements and any information pertaining to agreements made between the Proponent and the Ontario Power Authority from the Ontario Power Authority, the information set out in the CIA application and otherwise collected in accordance with the terms hereof, the terms of London Hydro's Conditions of Service and the requirements of the Distribution System Code and the use of such information for the purposes of the connection of the generation facility to London Hydro's distribution system.

Expected Monthly Generation, Consumption and Output From the EG Facility:

Expected:	Total Generation (a)		Total Internal Consumption (b)		Total Output (to London Hydro's Distribution System) (a-b)*	
	kWh	Peak kW	kWh	Peak kW	kWh	Peak kW
January		960 kW (max)				
February		960 kW (max)				
March		960 kW (max)				
April		960 kW (max)				
May		960 kW (max)				
June		960 kW (max)				
July		960 kW (max)				
August		960 kW (max)				
September		960 kW (max)				
October		960 kW (max)				
November		960 kW (max)				
December		960 kW (max)				

* This value would be negative when the generators are not in operation or when the internal consumption exceeds generation.

Notes:

1. Total generation shall vary, depending upon the heat available form the incinerator.

Connection Impact Assessment

Greenway Wastewater Treatment Plant
ORC Energy Recovery System
A Load Displacement Project

Summary Report

Prepared for
London Hydro

April 9, 2019

Prepared by:
Meir Klein, P. Eng.

600 Cochrane Drive, Suite 500
Markham, Ontario L3R 5K3
www.wsp.com

Table of Contents

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Executive Summary

This report is a summary of a connection impact assessment (CIA) study of a load displacement Organic Rankine Cycle (ORC) generator proposed to be connected to London Hydro's feeder 26M54 out of Talbot TS. The proposed 960 kW generator will be located inside the Greenway Waste Water Treatment Plant (WWTP) in London, Ontario and its generated power will be used solely to displace the local plant's load.

The purpose of the CIA study is to identify potential adverse electrical system impacts of the proposed ORC generator and determine mitigating options if any adverse impacts are found. This study assessed the impact of the generator on London Hydro's feeder with regards to a number of specific performance criteria.

The key conclusions of the study are as follows:

1. The proposed generator is not expected to have an adverse impact on the feeder's voltage or short circuit fault levels
2. The transfer trip from Talbot TS, proposed by the proponent, is required
3. The proposed synchronization scheme and its impact on the plant needs to be reviewed and an alternative scheme to synchronize through a 4.16 kV breaker needs to be investigated
4. Other requirements and connection issues, which are not part of this CIA, will be addressed by London Hydro.

1. Purpose

This report is a summary of a connection impact assessment (CIA) study of a load displacement Organic Rankine Cycle (ORC) generator proposed to be connected to London Hydro's feeder 26M54 out of Talbot TS. The proposed 960 kW generator will be located inside the Greenway Waste Water Treatment Plant (WWTP) in London, Ontario and its generated power will be used solely to displace the local plant's load.

The purpose of the CIA study is to identify potential adverse electrical system impacts of the proposed ORC generator and determine mitigating options if any adverse impacts are found. This study assessed the impact of the generator on London Hydro's feeder with regards to a number of specific performance criteria.

2. Project Description

The project covered by this CIA report is described in the table below:

Project name	Greenway WWTP ORC Energy Recovery System
Energy program	Load displacement
Developer	City of London
Municipal address	109 Greenside Ave, London, ON
Generation capacity (kW)	960
Type	Thermal generator
Generator	1200 kVA ORC, NIDEC LSA 50.2 L8 /4p
Generator rated voltage (V)	600
X"d (saturated)	9.9%
Main WWTP transformer	5 MVA, 27.6/4.16 kV, Delta/Yg, Z=5%
Generator step up transformer	1.5 MVA, 4.16/0.6 kV, Yg/Delta, Z=5%
High voltage feeder	27.6 kV, 26M54 out of Talbot TS, Bus Q1Q2
PCC voltage	27.6 kV
Other generation on feeder (kW)	1715 solar PV

3. Study Results

The table below summarizes the study findings:

Assessment Criterion	Finding
Impact on voltage	Criterion satisfied
Load flow analysis	Criterion satisfied
Continuous current rating	Criterion satisfied
Short circuit currents (TSC and LH limits)	Criterion satisfied
Proposed synchronization scheme through a 600 V breaker	Energizing the 4.16/0.6 kV GSU from the 4.16 kV side may result in an inrush current that will cause a noticeable voltage drop mainly on the plant's 4.16 kV bus
Transfer trip from Talbot TS	The proposed transfer trip is required
Connection to London Hydro's distribution system	An interlocking scheme is required to ensure that the generator is not online when the WWTP is supplied from an alternate feeder

4. Conclusions

The main conclusions of the study are as follows:

1. The proposed generator is not expected to have an adverse impact on the feeder's voltage or short circuit fault levels
2. The transfer trip from Talbot TS, proposed by the proponent, is required
3. The proposed synchronization scheme and its impact on the plant needs to be reviewed and an alternative scheme to synchronize through a 4.16 kV breaker needs to be investigated
4. Other requirements and connection issues, which are not part of this CIA, will be addressed by London Hydro.

111 Horton St.
P.O. Box 2700
London, ON N6A 4H6

Powering London.
Empowering You.

December 12th, 2019

Mark Elliott
Corporation of the City of London
109 Greenside Ave
London, ON N6J 2X5

RE: **109 Greenside Ave– 960kW Load Displacement**

This letter confirms London Hydro's costs associated with the connection of a load displacement generation service located at **109 Greenside Ave.** are **$62,150.00 ($55,000.00 + $7,150.00 HST).** This letter also summarizes London Hydro's and the customer's requirements and responsibilities for this service.

Hydro One Networks Inc. costs associated with the connection of a CHPSOP 2.0 generation service located at **109 Greenside Ave.** are **$327,700.00 ($290,000.00 + $37,700.00 HST).** Please refer to the Hydro One CCRA (42,290 CCRA Agreement) and Terms and Conditions (Terms and Conditions - CCRA LDC Embedded Generator 2012-1).

The customer will be required to provide a **disconnection device** capable of accepting a blocking signal from London Hydro and Hydro One in the event that the generator must be taken offline.

The customer's electrical contractor will be responsible for supply and installation of two 48" x 48" x 12" meter cabinets to accommodate London Hydro's metering as well as all other equipment required to interface with the customer's disconnection device. As well the customer's electrical contractor must provide a dedicated 120VAC supply receptacle in the metering cabinet. The meter cabinet must be installed on the load side of a fused disconnect or breaker and be grouped with all other meters in the same location as the main service entrance equipment.

Radio communication will be utilized for SCADA communication in replacement of the two phone lines detailed below. A radio RF study will be conducted to determine the feasibility of utilizing this method. If the results indicate that it is not feasible for radio communication to be used, then two phone lines as detailed below will need to be installed.

Communication requirements to be supplied by the customer are as follows:

- 1 dedicated dial up phone line at the customer's facility, 4 conductors with the phone number tagged to the conductor.
- Phone conductor to be run in 1/2 inch EMT conduit (or rigid PVC conduit) from the connected source to the meter cabinet.
- The 1/2 inch EMT conduit (or rigid PVC conduit) to be terminated with a 4 inch by 4 inch by 2 inch metal box within 18 inches of the meter cabinet.
- One foot of telephone conductor to be coiled in the 4 inch by 4 inch by 2 inch metal box.
- A 4 pin female RJ11 base board jack terminated on the end of the one foot coiled phone conductor in the 4 inch by 4 inch by 2 inch metal box.

Female RJ-11 Jack

Telephone Connector (RJ11)

Pin	Colour	Signal
1	Yellow	Line 2 tip
2	Green	Line 1 ring
3	Red	Line 1 tip
4	Black	Line 2 ring

- The jack should be labelled with the phone number.

The customer will be responsible for the monthly cost associated with the phone line rental and the numerical phone number must be provided to London Hydro.

The customer is also responsible for arranging with Bell Canada for an additional dedicated phone line to be installed at London Hydro's facilities at 111 Horton Street. The customer is responsible for all costs associated with the setup of this line as well as the monthly cost associated with the phone line rental.

London Hydro will supply the customer with one dry contact for OFFLINE control to their equipment. This will be an isolated contact with a 6A rating @ 24Vdc or 120Vac. As well, the customer will supply to the metering cabinet, one dry isolated contact with similar specifications as above. This will be London Hydro's verification that the customer is OFFLINE. This control wiring will be installed in conduit directly into the metering cabinet.

The above cost assumes all work will be performed during regular working hours (between 07:30 AM and 04:00 PM, Monday through Friday). **London Hydro will require a minimum of 4-6 weeks from receipt of the customer's payment to engineer, procure materials and schedule this project.**

Should you require additional information or clarification of these items, please contact our office.

Yours truly,

LONDON HYDRO

Dane Kirilovic C.E.T.
Engineering Technologist
519 661 5800 ext. 5612
Kirilovd@londonhydro.com

February 11th, 2021

Mark Elliott
Corporation of the City of London
109 Greenside Ave
London, ON N6J 2X5

RE: **109 Greenside Ave– 960kW Load Displacement**

This letter confirms London Hydro's costs associated with the installation of primary voltage transformers located at **109 Greenside Ave.** are **$15,142.00 ($13,400.00 + $1,742.00 HST)**. This letter also summarizes London Hydro's and the customer's requirements and responsibilities for this service.

As requested the marshaling box will be installed on the riser pole located near the London Hydro owned transformers. Please see attached standard for a primary metering kit. Please note that the installation will similar to this with no current transformers being installed.

The above cost assumes all work will be performed during regular working hours (between 07:30 AM and 04:00 PM, Monday through Friday). **London Hydro will require a minimum of 4-6 weeks from receipt of the customer's payment to engineer, procure materials and schedule this project.**

Should you require additional information or clarification of these items, please contact our office.

Yours truly,

LONDON HYDRO

Dane Kirilovic C.E.T.
Engineering Technologist
519 661 5800 ext. 5612
Kirilovd@londonhydro.com

Electrical Safety Authority

400 Sheldon Dr, Unit 1, Cambridge, ON , N1T 2H9
For inquiries:
TOLL FREE TEL: 1-877-372-7233 TOLL FREE FAX: 1-800-667-4278

www.esasafe.com

Connection Authorization Verification - Contractor Copy

J M R ELECTRIC LTD
301 THAMES RD E
EXETER ON N0M 1S3

NOTICE DATE: June 10, 2021
NOTIFICATION #: 16478810
INSPECTOR: Taylor, Michael
TELEPHONE: (519)521-8284
PRINT DATE: June 10, 2021
CUSTOMER ID: 381

Authorization Sent to:
LONDON HYDRO INC
PO 2700-111 HORTON ST
LONDON ON N6A 4H6

Supply Authority Business #: (519)661-5555

Re:
CITY OF LONDON
ORC ENERGY RECOVERY SYSTEM
109 GREENSIDE AVE
LONDON ON N6J 2X5

Connection Information:
Connection Type: STANDARD
Voltage Phase: HIGH VOLTAGE
Ampere Rating: OTHER
Metering Description: N/A
Service Details: NEW

Connection Authorization is only **Valid for 6 months** following the Notice Date.
After 6 months, **Re-inspection & NEW Connection Authorization are Required**.

SCHEDULE B

Single Line Diagram, Connection Point and Location of Facilities (section 2.3)

B.1 Single Line Diagram and Connection Point

Attach the Single Line Diagram

B.2 List of Facilities on the Property of the Other Party

B.2.1 The following facilities of the Generator are located on the property of London Hydro:

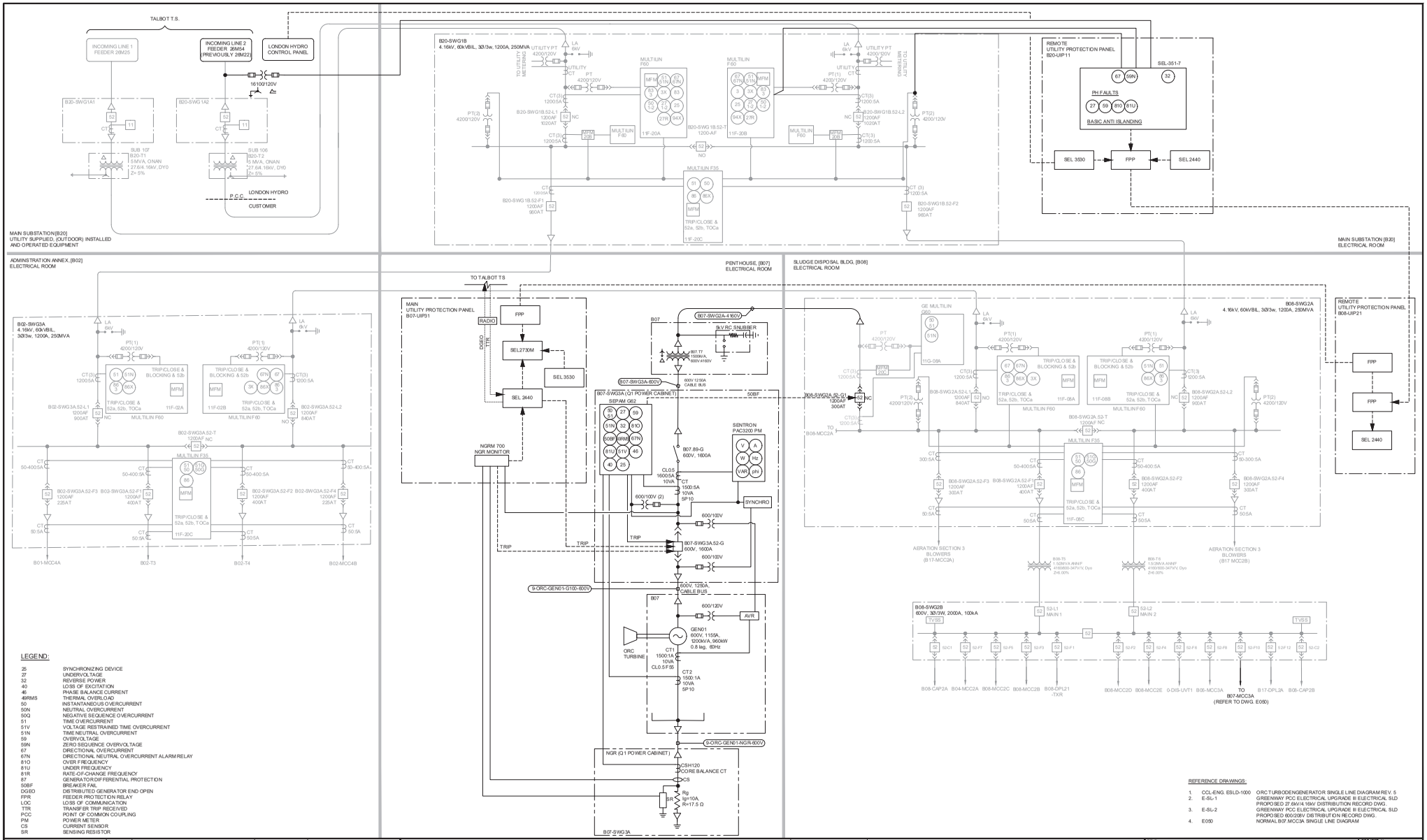
Not applicable

B.2.2 The following facilities of London Hydro are located in the property of the Generator:

Communication, data acquisition and disconnection equipment, etc. related to London Hydro operations in regards to this project.

B.3 Metering Installation Diagram

Included in the Single Line Diagram



LEGEND:

25	SYNCHRONIZING DEVICE
27	UNDERVOLTAGE
32	REVERSE POWER
40	LOSS OF EXCITATION
46	PHASE BALANCE CURRENT
49RMS	THERMAL OVERLOAD
50	INSTANTANEOUS OVERCURRENT
50N	NEUTRAL OVERCURRENT
50Q	NEGATIVE SEQUENCE OVERCURRENT
51	TIME OVERCURRENT
51V	VOLTAGE RESTRAINED TIME OVERCURRENT
51N	TIME NEUTRAL OVERCURRENT
59	OVERVOLTAGE
59N	ZERO SEQUENCE OVERVOLTAGE
67	DIRECTIONAL OVERCURRENT
67N	DIRECTIONAL NEUTRAL OVERCURRENT ALARM RELAY
81O	OVER FREQUENCY
81U	UNDER FREQUENCY
81R	RATE-OF-CHANGE FREQUENCY
87	GENERATOR DIFFERENTIAL PROTECTION
50BF	BREAKER FAIL
DGEO	DISTRIBUTED GENERATOR END OPEN
FPR	FEEDER PROTECTION RELAY
LOC	LOSS OF COMMUNICATION
TTR	TRANSFER TRIP RECEIVED
PCC	POINT OF COMMON COUPLING
PM	POWER METER
CS	CURRENT SENSOR
SR	SENSING RESISTOR

REFERENCE DRAWINGS:

1.	CCL-ENG. ESLD-1000	ORC TURBODENGENERATOR SINGLE LINE DIAGRAM REV. 5
2.	E-SL-1	GREENWAY PCC ELECTRICAL UPGRADE III ELECTRICAL SLD PROPOSED 27.6kV/4.16kV DISTRIBUTION RECORD DWG.
3.	E-SL-2	GREENWAY PCC ELECTRICAL UPGRADE III ELECTRICAL SLD PROPOSED 600/208V DISTRIBUTION RECORD DWG.
4.	E050	NORMAL B07_MCC3A SINGLE LINE DIAGRAM

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN NB	1	ISSUED FOR TENDER	MAY 28, 2019	GHD
DRAWN BY MT/AM	2	ISSUED FOR CONSTRUCTION	SEPTEMBER 5, 2019	GHD
CHECKED RT	3	ISSUED TO LONDON HYDRO	MAY 7, 2021	GHD
APPROVED TG				
DATE MAY 28, 2019				

CONSULTANT OR DIVISION: GHD

STAMP BOX: LICENSED PROFESSIONAL ENGINEER, R. J. TREMBLAY, May 7, 2021, PROVINCE OF ONTARIO

CORPORATION OF THE CITY OF LONDON

TITLE: GREENWAY WASTEWATER TREATMENT PLANT ORC ENERGY RECOVERY SYSTEM

ELECTRICAL

ORC GENERATOR CONNECTION SINGLE LINE DIAGRAM

PROJECT No. 8811165

SHEET No. E010

PLAN FILE No.

N:\CA\WATERLOO\LEGACY\CAD\DRAWINGS\8800000\S\8811165\8811165-REPORTS\8811165-00(003)EL\8811165-00(003)EL-WA010-R3.DWG, May 7, 2021

SCHEDULE C

List of Other Contracts (section 3.4)

C1. Reserve Capacity

London Hydro shall make available for the Generator the Reserve Capacity set out in this Schedule to this Agreement, such Reserve Capacity to be utilized by the Generator only in the event of a Forced Outage or a Scheduled Outage of the generator(s) while connected to its preferred (normal) feeder. Pricing per kilowatt shall be as per the latest approved OEB Rate Order.

The Reserve Capacity agreed to by the Generator and London Hydro shall be as follows:

____0_____ kilowatts of Reserved Capacity

Schedule "D"

Operating Procedures for the Connection of the City of London Organic Rankine Cycle Generator to the London Hydro Inc. Distribution System

May 2021

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1 INTRODUCTION

1.1 Background

The Corporation of the City of London Waste Water and Treatment Plant ("Greenway") located at 109 Greenside Avenue London, Ontario N6J 2X5 has an Organic Rankine Cycle (ORC) Energy Recovery System that uses waste heat to generate electricity at their facility. These operating procedures will apply to this ORC facility, which is connected to London Hydro Inc.'s ("London Hydro") distribution system. Greenway is connected to the 27.6 kV feeder 26M54 out of Talbot transformer station ("T.S.") at approximately 7.3 km from the transformer station. The feeder is normally supplied by the 27.6 kV 'Q1Q2' bus at Talbot T.S.

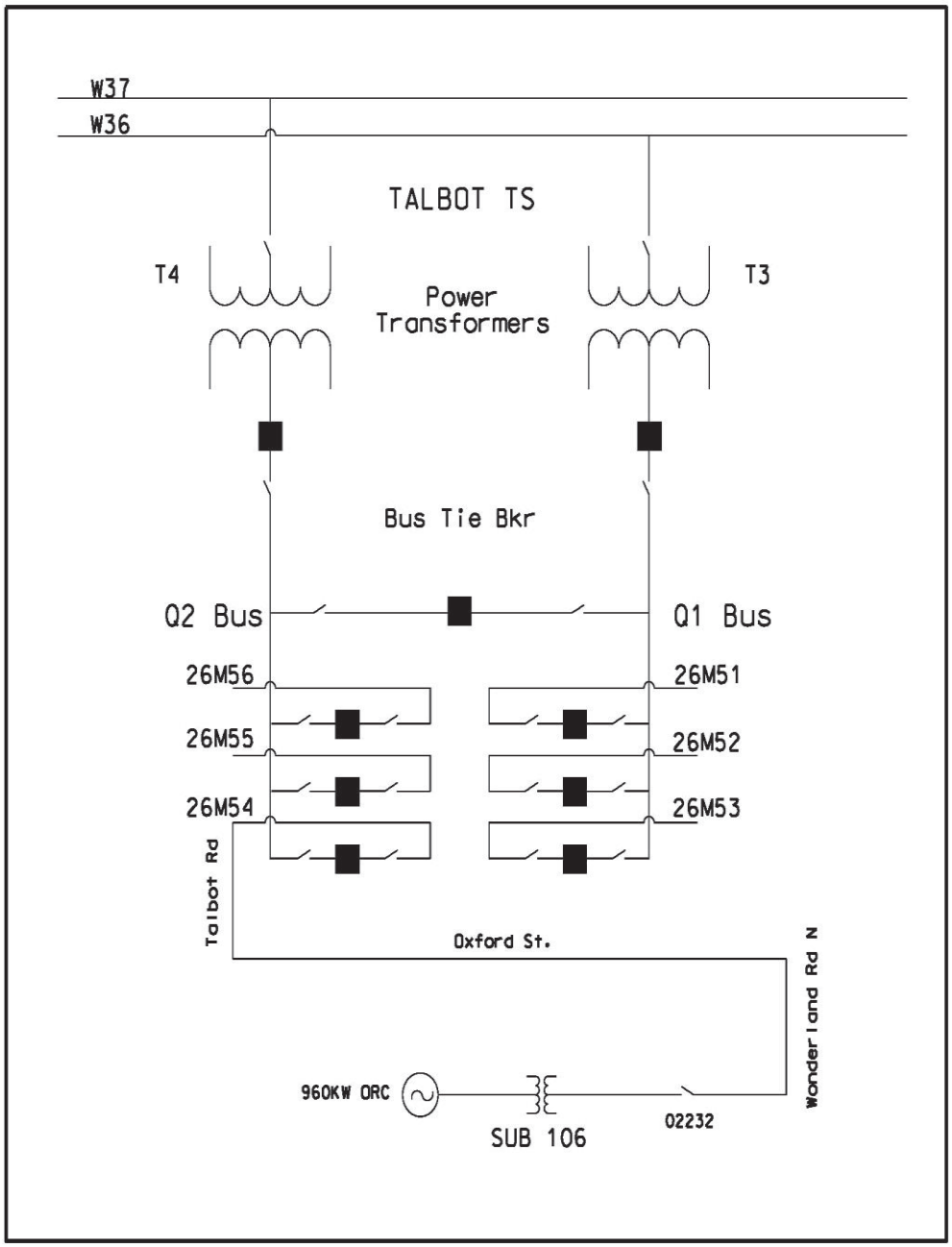

Figure 1-1, Arrangement of the Approved Generation Supply Feeder to Greenway

1.2 Intent

This document establishes the responsibilities and operating procedures to be observed by London Hydro and the City of London (COL) for the safe, secure and efficient operation of the ORC, thereby permitting their connection to the London Hydro distribution system and bulk electrical system.

The commercial arrangements (e.g. term of agreement, responsibilities for operating and maintenance costs, energy tariffs, technical performance requirements, liabilities for damages, remedies for nonperformance, etc.) are defined in a companion legal document entitled the *London Hydro Form of Connection Agreement for a Small or a Mid-Sized Embedded Generation* between London Hydro Inc. and the City of London.

1.3 Intended Audience

These Operating Procedures are intended to be a primary resource document for London Hydro System Operating Centre System Operators, Power Systems Engineers, and the COL Facility Power Plant electricians responsible for the day-to-day operation of Greenway's private distribution system, and the ORC facilities.

1.4 Definitions

The following terms are used throughout this document.

Agreement refers to the *London Hydro Form of Connection Agreement for a Small or a Mid-sized Embedded Generation Facility*, as amended from time to time by written consent of both parties.

Bulk Electric System a term commonly applied to the portion of an electric utility system that encompasses the electrical generation resources and bulk transmission system.

Supporting Guarantee A supporting guarantee is a guarantee issued in support of a Work Permit(s) and/or another Supporting Guarantee(s). It certifies that an isolated or isolated and de-energized condition exists at points under the control of the issuer of the Supporting Guarantee.

Control Authority has exclusive authority to perform, direct, instruct, or authorize the operation of specific devices in a definitive, clearly specified manner, is not synonymous with ownership, nor does it necessarily convey total independence of action

Emergency means any abnormal system condition that requires automatic or immediate manual action to prevent or limit loss of distribution or transmission facilities or generation supply that could adversely affect the reliability of the electric system.

Hold-Off means a procedure used to limit automatic operation of apparatus to facilitate work or to reduce work hazards.

IESO means Independent Electricity System Operator.

Island means a portion of a power system or several power systems that is electrically separated from the distribution grid due to the disconnection of a distribution system element.

Load Shedding means the process of deliberately removing (either manually or automatically) preselected customer demand from a power system in response to an abnormal condition to maintain the integrity of the system and minimize overall customer outages.

Medium-voltage means anything less than 50 kilovolts and above 1 kilovolt.

Operating Control means the control exercised by an operating authority when issuing instructions, in broad outline and terms, to another operating authority which, in turn may exercise its own judgement as to the proper time and method for carrying out such instructions.

Point of Common Coupling (PCC) means the connection point between the Greenway facility and the LDC distribution system. This is the interface point between ownerships.

Qualified means operating personnel are assessed for satisfactory performance and are considered qualified, with respect to competence and ability to perform the required tasks, having demonstrated a knowledge and familiarity with the apparatus, equipment, systems and devices and particularly established operational rules and procedures, including the potential dangers associated with the work, operation or process.

Supervisory Control and Data Acquisition (SCADA) means a system of remote control and telemetry used to monitor and control the electric system.

Synchronize means the process of connecting two previously separated alternating current apparatuses after matching frequency, voltage, phase angles, etc. (e.g. paralleling a generator to the electric system).

System Operator means an individual in an electric system control center whose responsibility is to monitor and control that electric system in real time.

Telemetering means the process by which measurable electrical quantities from substations and generating stations are instantaneously transmitted using telecommunication techniques.

Work Permit means a written protection guarantee issued by a London Hydro operator to a qualified person, under which specific work on specific apparatus is authorized.

1.5 Supplementary Operating Memorandums

From time to time, it may become necessary to supplement these Operating Procedures with information and interim instructions for dealing with situations that were unforeseen when this Schedule D was created (or last revised).

London Hydro may issue additional instructions and information by way of a Supplementary Operating Memorandum that will become part of this Schedule upon approval by the COL. The format of the Supplementary Operating Memorandum is included as Appendix B. Alternatively this Schedule D maybe reissued by London Hydro and the COL in its entirety.

1.6 Safe Work Planning

Safe work planning practices such as pre-job plans and tailboard conference procedures shall be followed whenever both parties (i.e. the COL and London Hydro) are involved in work on the interconnected system. Nothing in these Operating Procedures should be interpreted as altering the intent of London Hydro's safe work practices manual or safe operating procedures. Any contradictions are to be identified and resolved prior to work commencing.

2 RESPONSIBILITIES

2.1 Operating Authority & Operating Control

London Hydro has *Operating Control* of the feeder circuit breakers at Talbot T.S. Hydro One's Ontario Grid Control Centre is the *Controlling Authority* for all the circuit breakers supplying the London Hydro distribution system, and executes circuit breaker operations.

The City of London has *Control Authority* and has exclusive *Operating Control* of all 4.16 kV switching elements within the customer interconnected substation at Greenway Waste Water Treatment Plant, the ORC, and the private internal distribution system.

The operating personnel shall be as listed in Appendix D.

2.2 Training Requirements

The COL Facility electricians or designated representatives shall be qualified in ORC operation and be able to respond quickly and effectively to normal and emergency operations and conditions.

The COL Facility electricians or designated representatives shall be familiar with and be adequately trained in proper procedures for setting power distribution and control devices, protective relays, circuit breakers and operation of isolation switches in or out of service.

2.3 Maintenance Requirements

London Hydro and the COL are each responsible for the maintenance (both preventive and corrective) of the equipment under their respective ownership.

2.3.1 London Hydro

London Hydro's inspection and maintenance activities are prescribed within *System Inspection Requirements and Maintenance*, of the Ontario Energy Board's *Distribution System Code*.

2.3.2 Hydro One Networks

Hydro One's inspection and maintenance program for transformer stations fulfill the performance requirements defined within, *Requirements for Operations and Maintenance*, of the Ontario Energy Board's *Transmission System Code*.

2.3.3 City of London

The COL shall have a preventative maintenance program covering the ORC, including ancillary equipment, which reflects good industry practice.

The COL shall have a preventative maintenance program covering their electrical power coupling substation and other privately-owned medium-voltage distribution system devices that reflects good industry practice, in general accordance with the current NETA Standard, *Maintenance Testing Specifications for Electrical Power Distribution Equipment and Systems* or other standards as applicable.

In addition, the schedule outlined in the Protection and Control Systems Equipment section of the most recent Hydro One Technical Interconnection Requirements (TIR) document shall be used to re-verify interconnection Protection and Control sub-systems. The appropriate sections are listed below:

- every 8 years for IED-based protection sub-systems that employ comprehensive self-diagnostic features to detect and provide alarm telemetry
- every 4 years for electromechanical or other non IED-based protection sub-systems that do not employ comprehensive self-diagnostic features to detect and provide alarm telemetry

The COL shall have a program for periodically verifying the communication channels associated with the TT/DGEO Freewave radio protection terminal equipment to verify that the channels are operational and that their characteristics lay within specific tolerances. Such testing shall be carried out every two (2) years, and shall include signal adequacy tests and channel performance tests.

Note: If Hydro One personnel are required to participate in the verification of the Freewave radio protection channels and terminal equipment, the COL will bear all incurred costs. In such cases, the COL shall provide London Hydro with a purchase order so that Hydro One's charges may be passed on to the COL.

London Hydro, at its discretion, may participate in commissioning, inspecting, and testing customer protection (including Freewave radio protection terminal equipment) systems to ensure that equipment connected to the

distribution system will not materially reduce or adversely affect the current level of reliability of the supply feeder circuits.

2.4 Telemetry Requirements

The COL shall provide facilities and connections for telemetry of key operating information to London Hydro's SCADA Master Station. See Tables 2-1, 2-2, and 2-3.

Table 2-1, SCADA Information

Station Name	Equipment Name	Telemetry Point
Greenway	B07-SWG3A.52-G	MW
Greenway	B07-SWG3A.52-G	MX
Greenway	B07-SWG3A.52-G	AMP R
Greenway	B07-SWG3A.52-G	AMP W
Greenway	B07-SWG3A.52-G	AMP B
Greenway	B07-SWG3A.52-G	VOLT R/W
Greenway	B07-SWG3A.52-G	VOLT W/B
Greenway	B07-SWG3A.52-G	VOLT R/B

Table 2-2, Alarms

Station Name	Equipment Name	Alarm Telemetry Point
Greenway	B07-SWG3A.52-G	TT Comm Channel Fail
Greenway	B07-SWG3A.52-G	Transfer Trip Protection Fail
Greenway	B07-SWG3A.52-G	Breaker Fail (52-G1)

Table 2-3, Status

Station Name	Equipment Name	Status Telemetry Point
Greenway	B07-SWG3A.52-G	OPEN/CLOSE
Greenway	B07.89-G	OPEN/CLOSE
Greenway	B20-SWG1B.52-L1	OPEN/CLOSE
Greenway	B20-SWG1B.52-L2	OPEN/CLOSE
Greenway	B20-SWG1B.52-T	OPEN/CLOSE
Greenway	B20-SWG1B.52-F2	OPEN/CLOSE
Greenway	B08-SWG2A.52-L1	OPEN/CLOSE
Greenway	B08-SWG2A.52-L2	OPEN/CLOSE
Greenway	B08-SWG2A.52-T	OPEN/CLOSE
Greenway	B08-SWG2A.52-G1	OPEN/CLOSE

3 COMMON OPERATING DIAGRAM

London Hydro Operators, Hydro One Operators, and the COL Facility electricians shall refer to the Common Operating Diagram (included as Appendix A) when discussing planned work or operating problems. It is the responsibility of the COL to provide London Hydro with the latest revisions of all diagrams including SLD's, etc. in a timely manner. The Common Operating Diagram and SLD must be readily available and accessible on site at all times.

4 COMMUNICATIONS BETWEEN CONTROL ROOMS

4.1 Communication Protocol

Communications between the COL Facility electricians and London Hydro's System Operators shall normally be by landlines and/or cellular telephone.

Published and/or unlisted office and emergency telephone numbers of staff responsible for operating activities are listed in Appendix D.

The COL and London Hydro will inform each other of any changes to the telephone listings as soon as is possible.

4.2 Exception – Emergency Operations

During an emergency, Hydro One, London Hydro or the COL may take whatever immediate action it deems necessary and is qualified to perform to safeguard public safety, life, and property without first notifying the other parties.

The party who is taking such action shall promptly report the action taken and the reason for it to the other party's controlling authority.

The COL shall notify London Hydro as soon as is practical of all significant events with respect to the medium-voltage system that occur within the ORC Greenway Facility, including:

- All faults in their equipment that have caused protection operations;
- When their protection operations disconnect them from the London Hydro distribution system.

Hydro One (the provincial transmitter) may be required from time to time by the Independent Electricity System Operator (IESO) to interrupt supply to London Hydro during an emergency to protect the stability, reliability, and integrity of the provincial transmission grid. When Hydro One advises London Hydro of the transmission system's emergency status and when to expect reconnection to the transmission system, this information will be conveyed to the COL.

5 AUTOMATIC OPERATING SYSTEMS

5.1 Review of Objectives

The automatic protective and control systems associated with the COL's ORC Greenway facility are intended to prevent or protect against the following adverse conditions on London Hydro's distribution system:

- A synchronizing check is required whenever reconnecting to the grid and there is a possibility of a difference between the generator frequency and the grid frequency
- Inadvertent and unwanted re-energization of a London Hydro de-energized circuit
- Overcurrent
- Voltage unbalance
- Ground faults
- Frequency outside permitted safe limits
- Voltage outside permitted limits (prevent inrush due to transformer energization)
- Power factor or reactive power (VAR) outside permitted limits
- Abnormal waveforms

- Breaker failure
- Unintentional energization of customer owned substation by London Hydro

There shall be no changes or modifications to equipment related to the ORC connection such as but not limited to protection systems, medium-voltage electrical plant, protection settings, and metering system configuration without prior notification to London Hydro.

5.2 Transfer Trip / Distributed Generator End Open

Since the Transfer Trip / Distributed Generator End Open Freewave radio protection terminal equipment is only installed on the 26M54 feeder, anytime the COL Greenway / load is temporarily transferred to another feeder, the COL shall not be allowed to connect the ORC onto London Hydro's distribution system. London Hydro has the sole right to temporarily transfer COL's Greenway / load at its discretion to accommodate loading, system problems, construction activity, etc.

In the event of a line fault or over-current condition on the 26M54 circuit, to ensure that the feeder circuit breaker doesn't reclose before the COL's ORC has been electrically separated from London Hydro's distribution system, a Transfer Trip / Distributed Generator End Open (TT/DGEO) Freewave radio protection system shall be provided between the 26M54 feeder circuit breaker and Greenway.

A trip signal to the 26M54 feeder circuit breaker (originating from either the Q bus protection system or the 26M54 feeder protection system) is transmitted via Freewave radio to the COL Greenway facility to simultaneously trip the main circuit breaker designated B07-SWG3A.52-G, thereby electrically separating the ORC from London Hydro's distribution system.

The 26M54 feeder circuit breaker will be prevented from reclosing until it receives a permissive signal (DGEO) from the COL Greenway Facility indicating that the B07-SWG3A.52-G breaker or the B08-SWG2A.52-G1 (breaker fail scheme) have in fact tripped or any one the upstream breakers are open (B08-SWG2A.52-T or B08-SWG2A.52-L2 or B20-SWG1B.52-F2 or B20-SWG1B.52-L2), thereby separating the ORC from London Hydro's distribution system. In addition, if for some reason the COL breaker B07-SWG3A.52-G is out of service, it should not inhibit the operation of the Talbot T.S. breaker.

The TT/DGEO terminal equipment shall include monitoring circuitry that continuously assesses the condition of the interconnecting Freewave radio connection.

Upon failure of the Freewave radio connection:

- The reclosing operation is blocked on the 26M54 feeder circuit breaker
- An annunciation is activated within COL Greenway Facility and, if the condition prevails for more than 5 seconds, the main breaker B07-SWG3A.B07-SWG3A.52-G shall automatically be tripped.

5.3 Protection and Controls

5.3.1 Power Factor

The ORC shall be set so that the nominal power factor is in the range of 0.95 lag to unity (i.e. reactive power is not supplied to London Hydro's distribution system).

5.3.2 Automatic Synchronizing Control

An automatic synchronizing device is required whenever paralleling two different systems that are out of phase. Otherwise, facility equipment may experience mechanical stress that may in some circumstances lead to severe damage. Breaker B07-SWG3A.52-G is a synchronizing breaker.

5.3.3 Generator Protection

As a minimum, the COL Greenway ORC shall be equipped with the following protections:

- Synchronization check (function 25)
- Under-voltage protection (function 27)
- Reverse power protection (function 32)
- Breaker failure protection (function 50BF)
- Instantaneous overcurrent protection (function 50)
- Ground instantaneous overcurrent protection (function 50G)
- Time overcurrent protection (function 51)
- Ground time overcurrent protection (51G)
- Over-voltage protection (function 59)
- Under/Over-frequency protection (function 81O/U)

Note: The function designations given in the brackets are explicitly defined within IEEE Standard C37.2, *Electrical Power System Device Function Numbers*.

The COL Greenway ORC may have more protective relays than listed above.

5.3.4 Electrical Interlocks

An interlocking scheme shall be installed and commissioned such that in no way can the two London Hydro feeders supplying the COL Greenway facility be paralleled. In addition, the interlocks shall prevent the generator from being connected to a non-approved feeder, at any point within the customer's electrical distribution system.

6 NORMAL (PRE-CONTINGENCY) OPERATING PROCEDURES

6.1 Planned Switching on the 26M54 Feeder Circuit

For planned switching on the 26M54 feeder circuit that requires the COL's customer substation to be transferred to another distribution feeder, arrangements will have to be made to disconnect the ORC from London Hydro's distribution system.

When possible, London Hydro will endeavour to notify the COL a minimum of twelve hours in advance of planned switching that will require changing the supply feeder to the COL Greenway Facility.

It is understood that there are special situations when the notification will not be possible or the notification period will be considerably less. By way of example, if the discovered condition of a distribution system element was deemed to pose a potential threat to public safety or system reliability, London Hydro may not delay corrective action and, as such, a notification period may not be possible.

6.2 Customer Isolation Request

This subsection outlines the general procedure used to de-energize the high-voltage (4.16kV) secondary circuit to permit the customer to carry out corrective repairs and/or acceptance or maintenance tests on their underground circuit. Exact switching procedure will be determined based on the isolation request in accordance to the Utility Work Protection Code.

- A request for isolation can be submitted by completing a "Customer Isolation Request Form". The form can be made available upon request to systemoperating@londonhydro.com

- Customer substation isolations are billable, and will be billed on actual time and material rates.
- Once the application has been received, a cost estimate can be provided prior to issuing purchase order
- Isolation request forms shall be submitted at least 10 business days before the outage date required.
- London Hydro will not operate any customer-owned equipment. The Contractor shall be responsible for operating such equipment.
- The Contractor shall be competent in operating electrical equipment and understand the requirements to complete work safely.
- London Hydro is not responsible for damage created due to Contractor error, customer equipment condition, closing in on temporary working grounds, etc.
- London Hydro will make every reasonable attempt to isolate and reconnect the customer at the required times, however there may be instances where London Hydro may delay or cancel the outage due to weather, labour shortages or other unknown causes.

6.3 Failure of the Communication System for Revenue Metering

In the event of a failure of the communication system that is used by London Hydro's MV-90 metering data collection system to interrogate the interval-style revenue meters installed within the COL's substation, London Hydro will notify the COL and co-ordinate to repair the London Hydro owned communication equipment. Failed revenue metering communication will result in a charge for each manual meter read, required weekly, and will continue until such time as the communication is restored.

Further details are provided in Appendix C.

6.4 Failure of the Radio Communication System for SCADA

In the event of a failure of the radio communication system which extends between London Hydro's SCADA master station and the COL Greenway Facility, London Hydro will co-ordinate with the COL to initiate immediate repairs carried out by London Hydro.

6.5 Failure of the COL Greenway Revenue Meters or Instrument Transformers

In the event that the PCC meter (or associated instrument transformers) fails, thereby preventing the recording or transmission of meter data, the ORC must be taken offline or disconnected until the meter or IT is replaced. Please see Appendix C for more details.

7 POST-CONTINGENCY OPERATING PROCEDURES

7.1 Automatic Operations on the 26M54 Feeder Circuit

7.1.1 Successful Reclosure Operation on 26M54 Feeder Circuit

A fault or overcurrent condition on the 26M54 circuit will result in the following automatic operations:

- Tripping of the Talbot T.S. 26M54 circuit breaker;
- Tripping of breaker B07-SWG3A.52-G and
- Reclosing (upon receipt of TT/DGEO permissive) of the Talbot TS 26M54 circuit breaker.

In all cases the COL Greenway Facility electricians must contact London Hydro's System Operating Centre prior to reconnection to ensure the cause has been found and it is safe to reconnect.

7.1.2 Lockout Operation on 26M54 Feeder Circuit

For lockout operations on the 26M54 feeder circuit, the COL Greenway ORC will have to remain disconnected from London Hydro's distribution system until such time as the underlying problem is found (often by London Hydro crews patrolling the line) and remedial works are completed on London Hydro's system.

Depending upon the nature of the underlying problem and the expected timeframe to complete repairs, London Hydro will restore supply to the COL Greenway Facility in a timely fashion by reconfiguring the 26M54 feeder circuit via switching operations.

London Hydro's system operators will endeavor to keep the COL Facility electricians apprised of the status of remedial repairs and the expected time when the COL Greenway ORC may be reconnected in parallel.

In all cases the COL Greenway Facility electricians must contact London Hydro's System Operating Centre prior to reconnection to ensure the cause has been found and it is safe to reconnect.

7.2 Failure of Freewave Radio Protection Circuit

As noted in Section 5.2, failure of the TT/DGEO Freewave radio protection circuit that interconnects the COL Greenway substation with Talbot T.S. will result in annunciation and separation of the ORC from London Hydro's distribution system if the condition prevails for more than a predefined duration.

Once repairs are completed, arrangements may be made to reconnect the ORC in parallel with London Hydro's distribution system in accordance with established protocols for such activities.

With respect to responsibility for the work and costs associated with breakdown maintenance:

- If maintenance or repair is required on the Freewave radio protection terminal equipment located at the COL Greenway facility, the COL will bear all incurred costs.
- If maintenance is required on the Freewave radio protection terminal equipment located within Talbot T.S., Hydro One will bear all incurred costs.

8 PROVISION OF INFORMATION

8.1 Maintenance Records

The COL shall maintain records setting out the results of all performance testing and monitoring conducted to demonstrate compliance with the Agreement for seven (7) years from the date of the testing or monitoring activity and shall make those records available to London Hydro upon request.

8.2 Revenue Metering Data Via the Commerce App

For help with access to information on your revenue meter please contact London Hydro's Customer Relationship Manager for a demonstration.

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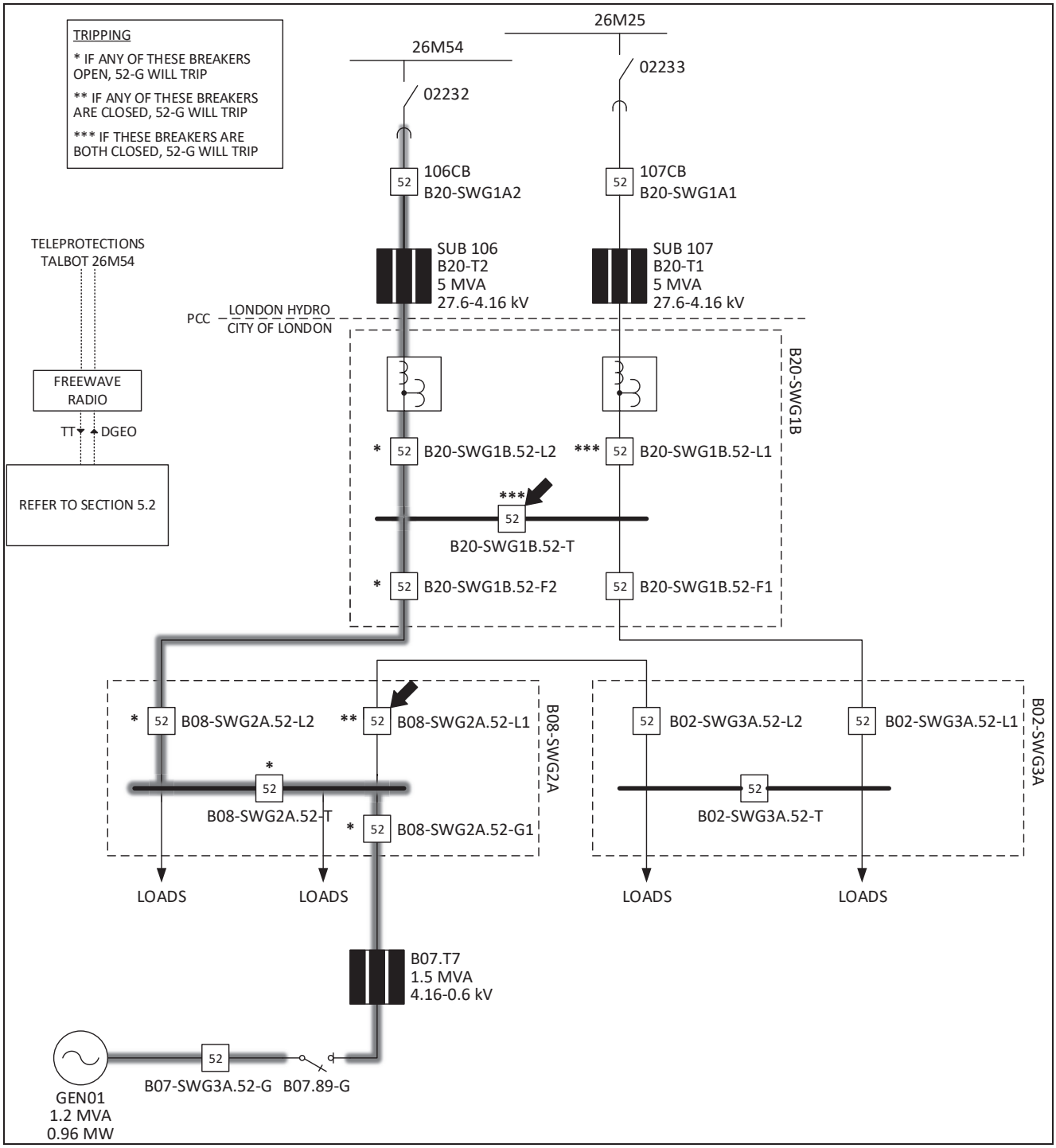
Appendix A

Common Operating Diagram



Appendix B

Supplementary Operating Memorandum

Supplementary Operating Memorandum: #1

Subject:

Effective Date:

Example Only

Authorizations:

Rolf Reiners London Hydro Inc.	Name City of London Inc.

♦ - ♦ - ♦

Appendix C

Metering Terms and Conditions

City of London (COL) and London Hydro Inc.

1. **London Hydro Responsibility:** London Hydro will be responsible for installation, maintenance, commissioning, replacements, testing, MC-sealing and ongoing routine maintenance of the Point of Common Coupling (PCC) main meter. The Primary meter is also used for SCADA communications to London Hydro Operations. London Hydro reserves the right to perform tests at any time on the meter.

   London Hydro will be responsible for all metering costs including but not limited to current transformers (CT's), potential transformers (PT's); electric meters; internal communications system and equipment; failed equipment replacement will result in a bill for time and materials; all spare equipment and storage; MC-sealing; exchange and replacements; and all related metering system costs, initially and on an ongoing basis.

2. **Trouble Call Communications:** Trouble calls for inability to communicate to or from external stakeholders such as London Hydro or Hydro One, will be directed to London Hydro and their qualified meter technician.

3. **Metering and Physical Access:** The metering cabinet and IT compartment must be locked and under London Hydro access control with a London Hydro lock.

Appendix D

Telephone Contact Information

London Hydro Inc.	
• System Operator (routine)	519-661-5800 Ext. 5585
• System Operator (emergency)	519-661-0480
• System Operating Supervisor (Rolf Reiners)	519-661-5800 Ext. 5450
• Manager Operations Engineering (Hassan El-Madhoun)	519-661-5800 Ext. 5853
•	
City of London	
• Normal Business Hours Contact (Chief Operator)	519-661-2489 Ext. 1008
• After Hours Contact (Chief Operator)	519-661-2489 Ext 1008
• Greenway Control Room	519-808-2455
• Supervisor of Operations (Chris McKenzie)	519-808-3432
Manager of Operations (Mark Spitzig)	519-808-2760

SCHEDULE E

Billing and Settlement Procedures (section 5.3)

E RATES AND CHARGES

E.1 Competitive Charges to London Hydro

The London Hydro meters will be used as the basis for deriving monthly Totalized Net Bills (one billing account). London Hydro shall comply with RSC, HONI TRS, DSC, IESO market rules (Global adjustments) and OEB approved London Hydro Rate Orders (and all other applicable statutes, regulations, rules, codes and guidelines) in calculating the settlement costs. The Customer will make payment for total net charges within London Hydro's payment terms the same as any other distribution customer.

When the London Hydro settlement meter is not located at the Connection Point London Hydro shall determine and make adjustments to the measured quantities to reflect the inherent transformation and/or line losses, as defined in the London Hydro COS, IESO market rules, OPA rules and RSC, where applicable. For Capacity Power delivered from the Generator at the Connection Point to London Hydro, in excess of General Power supplied by London Hydro to the Generator in a given settlement hour, London Hydro shall settle with and make payments to the Generator in respect of the Capacity Power delivered by the Generator to London Hydro. The Generator has an opportunity, but not an obligation, to deliver Capacity Power to London Hydro. London Hydro agrees to purchase all Capacity Power delivered at the Delivery Point. London Hydro shall pay the Generator for all such delivered Capacity Power in a given settlement hour at HOEP, as per Section 3.2 of the RSC.

E.2 Competitive Charges to the Generator

The Generator shall settle with and make all payments to London Hydro in respect of the General Power supplied by London Hydro to the Generator. The Generator shall pay London Hydro for all such delivered General Power in a given settlement hour using the Customer Supply Option rules defined in either the RSC, SSSC, or retailer contract.

E.3 Non-Competitive Charges to the Generator

The Generator shall pay to London Hydro the demand and energy regulated charges for General Power using the OEB approved London Hydro regulated rates and more particularly described in London Hydro's documented COS. All non-competitive charges are applied against the General Power.

E.4 Taxes

The Generator shall pay to London Hydro and London Hydro shall pay to the Generator, as the case may be, the full amount of all Harmonized Sales Tax, Value-Added Taxes, Business Transfer Taxes, and/or any other taxes which may be imposed upon the rates and charges from time to time by any Governmental authority.

E.5 Billing Statements

London Hydro shall prepare a Totalized Net Bill for the Billing Period showing the amount billed for Power delivered and Power received as soon as practical after the end of the Billing Period (approximately 11 business days is typically required to determine the settlement prices, outlined in the RSC), and such Total Net Bill shall be remitted to the Generator with payment to be due (either to London Hydro, or to the Generator, as the case may be) within sixteen (16) days after the date of issue. London Hydro shall forward such Total Net Bill to the Generator forthwith after issue. If payment is not paid by the Generator by the due date, it shall be subject to interest and penalty charges and or disconnection for late payment on the same basis as other distribution customers of London Hydro.

E.6 Adjustment of Rates and Charges

The London Hydro OEB approved regulated rates and charges may be revised from time to time.

SCHEDULE G

Dispute Resolution (section 16.1)

G.1 The Party claiming a dispute will provide written notice to the other Party. The Parties will make reasonable efforts through or by their respective senior executives to resolve any dispute within sixty days of receipt of such notice.

G.2 The nature of the dispute may require civic administration of the City to obtain instructions from Council or delegated authority to bind the City. If a dispute is settled by the senior executives of the Parties, the Parties shall prepare and execute minutes setting forth the terms of the settlement. Such terms shall bind the Parties. The subject-matter of the dispute shall not thereafter be the subject of any civil or other proceeding, other than in relation to the enforcement of the terms of the settlement. If a Party fails to comply with the terms of settlement, the other Party may submit the matter to arbitration under section G.3. A copy of the minutes referred to in this section from which all confidential information has been expunged shall be made available to the public by London Hydro upon request.

G.3 If the senior executives of the Parties cannot resolve the dispute within the time period set out in section G.1 or such longer or shorter period as the Parties may agree, either Party may submit the dispute to binding arbitration under sections G.4 to G.8 by notice to the other Party.

G.4 The Parties shall use good faith efforts to appoint a single arbitrator for purposes of the arbitration of the dispute. If the Parties fail to agree upon a single arbitrator within ten working days of the date of the notice referred to in section G.3, each Party shall within five working days thereafter choose one arbitrator. The two arbitrators so chosen shall within fifteen working days select a third arbitrator.

G.5 Where a Party has failed to choose an arbitrator under section G.4 within the time allowed, the other Party may apply to a court to appoint a single arbitrator to resolve the dispute.

G.6 A person may be appointed as an arbitrator if that person:

(a) is independent of the Parties;

(b) has no current or past substantial business or financial relationship with either Party, except for prior arbitration; and

(c) is qualified by education or experience to resolve the dispute.

G.7 The arbitrator(s) shall provide each of the Parties with an opportunity to be heard orally and/or in writing, as may be appropriate to the nature of the dispute.

G.8 The *Arbitration Act, 1991* (Ontario) shall apply to an arbitration conducted under this Schedule G.

G.9 The decision of the arbitrator(s) shall be final and binding on the Parties and

may be enforced in accordance with the provisions of the *Arbitration Act, 1991* (Ontario). The Party against which the decision is enforced shall bear all costs and expenses reasonably incurred by the other Party in enforcing the decision.

G.10 A copy of the decision of the arbitrator(s) from which any confidential information has been expunged shall be made available to the public by London Hydro upon request.

G.11 Subject to section G.12, each Party shall be responsible for its own costs and expenses incurred in the arbitration of a dispute and for the costs and expenses of the arbitrator(s) if appointed to resolve the dispute.

G.12 The arbitrator(s) may, if the arbitrator(s) consider it just and reasonable to do so, make an award of costs against or in favour of a Party to the dispute. Such an award of costs may relate to either or both the costs and expenses of the arbitrator(s) and the costs and expenses of the Parties to the dispute.

G.13 If a dispute is settled by the Parties during the course of an arbitration, the Parties shall prepare and execute minutes setting forth the terms of the settlement. Such terms shall bind the Parties, and either Party may request that the arbitrator(s) record the settlement in the form of an award under section 36 of the *Arbitration Act, 1991* (Ontario). The subject-matter of the dispute shall not thereafter be the subject of any civil or other proceeding, other than in relation to the enforcement of the terms of the settlement.

G.14 If a Party fails to comply with the terms of settlement referred to in section G.13, the other Party may submit the matter to arbitration under section G.3 if the settlement has not been recorded in the form of an award under section 36 of the *Arbitration Act, 1991* (Ontario).

G.15. A copy of the minutes referred to in section G.13 from which all confidential information has been expunged shall be made available to the public by London Hydro upon request.

G.16 The Parties may not, by means of the settlement of a dispute under section G.2 or section G.13, agree to terms or conditions that are inconsistent with or contrary to the Code or this Agreement.

SCHEDULE F

Contacts for Notice (section 12.1)

Telephone Contact Information

London Hydro Inc.		
•	System Operator (routine)	519-661-5800 Ext. 5585
•	System Operator (emergency)	519-661-0480
•	Operations Supervisor (Rolf Reiners)	519-661-5800 Ext. 5450
•	Distribution Engineer (Hassan El-Madhoun)	519-661-5800 Ext. 5853
•		
City of London		
•	Normal business hours contact (Chief Operator)	519-661-2489 Ext. 1008
•	After hours contact (Chief Operator)	519-661-2489 Ext. 1008
	Greenway Control Room	519-808-2455
•	Supervisor of Operations (Chris McKenzie)	519-808-3432
•	Manager of Operations (Mark Spitzig)	519-808-2760

Parties to Receive Notices

If to Generator:
City of London (Greenway WWTP)
109 Greenside Avenue
London, Ontario
N6J 2X5
Attention: Kirby Oudekerk P.Eng., Division Manager
Email: koudeker@london.ca
Mark Spitzig, Manager of Operations
Email: mspitzig@london.ca

If to London Hydro:
London Hydro Inc.
111 Horton Street
London, Ontario
N6A 4H6
Attention: William A. Milroy, P.Eng., V.P. of Engineering & Operations
Email: milroyw@londonhydro.com

SCHEDULE H

Provisions Applicable if Facility Financed by a Lender

(sections 19.3, 20.3 and 21.1)

H.1 For the purposes of this Schedule, "lender" means a bank or other entity whose principal business in that of a financial institution and that is financing or refinancing the Facility.

H.2 Where notice of a Default has been served on the Generator under section 19.3, an agent or trustee for and on behalf of a lender ("Security Trustee") or a receiver appointed by the Security Trustee ("Receiver") shall upon notice to London Hydro be entitled (but not obligated) to exercise all of the rights and obligations of the Generator under this Agreement and shall be entitled to remedy the Default specified in the notice within the applicable cure period referred to in section 19.4. London Hydro shall accept performance of the Generator's obligations under this Agreement by the Security Trustee or Receiver in lieu of the Generator's performance of such obligations, and will not exercise any right to terminate this Agreement under section 19.3 due to a Default if the Security Trustee, its nominee or transferee, or the Receiver acknowledges its intention to be bound by the terms of this Agreement and such acknowledgment is received within 30 days of the date of receipt by the Generator of the notice of Default.

H.3 The Generator may, without the prior written consent of London Hydro, assign by way of security only all or any part of its rights or obligations under this Agreement to a lender. The Generator shall promptly notify London Hydro upon making any such assignment.

H.4 The Generator may disclose confidential information of London Hydro to a lender or a prospective lender.