



Executive Summary

NAPANEE GENERATING STATION PROJECT DESCRIPTION

Prepared For:

Canadian Environmental Assessment Agency

Prepared By:

TransCanada
and
SENES Consultants

October 2013

**NAPANEE GENERATING STATION
PROJECT DESCRIPTION
EXECUTIVE SUMMARY**

Prepared for:

Canadian Environmental Assessment Agency
55 St. Clair Avenue East, Suite 907
Toronto, Ontario
M4T 1M2

Prepared by:



Royal Bank Plaza, 24th Floor, South Tower
200 Bay Street, P.O. Box 43
Toronto, Ontario
M5J 2J1

And



121 Granton Drive, Unit 12
Richmond Hill, Ontario
L4B 3N4

October 2013

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GENERAL DESCRIPTION OF THE PROPOSED PROJECT

Project Name

Napanee Generating Station

Nature of the Project and Location

TransCanada Energy Ltd. (TransCanada) proposes to construct and operate the Napanee Generating Station (or the Project), a 970 megawatt (MW) natural gas-fuelled electricity generating station located on the existing Ontario Power Generation Inc. (OPG) Lennox Generating Station (Lennox GS) site in the Town of Greater Napanee in the Province of Ontario (Figure 1). The Project is a combined cycle facility, which uses both gas and steam turbines to very effectively and efficiently produce power. The Project will be an essential component of Ontario's electrical system. It will replace retired coal capacity, help manage changes in nuclear capacity due to planned refurbishments/retirements over the next 15 years, address rising electricity demand and provide a source of on-demand power to backstop wind and solar generation.

The Project site is approximately 38 hectares (ha) in size located immediately to the east of OPG's Lennox GS on the north side of Loyalist Parkway (Highway 33) east of County Road 21 (Figure 2). Figure 3 shows the Napanee Generating Station adjacent to the Lennox GS.

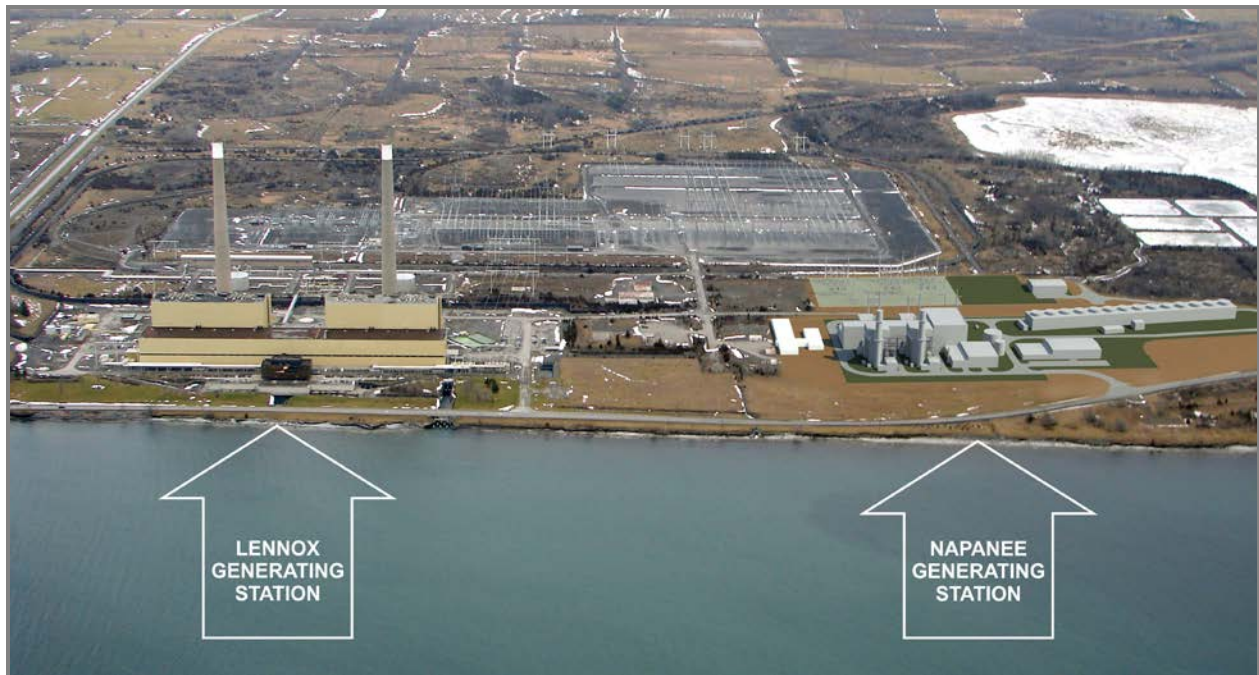
Figure 1 Location of the Project



Figure 2 Location of the Project and Lennox Generating Station



Figure 3 Napanee Generating Station and Adjacent Lennox Generating Station



PROPONENT AND CONTACT INFORMATION

Name of the Proponent

The proponent of the Project is TransCanada Energy Ltd (TransCanada).

Proponent Address

TransCanada – Napanee Generating Station Project
Royal Bank Plaza, 24th Floor, South Tower
200 Bay Street, P.O. Box 43
Toronto, ON M5J 2J1

Principal Contact

Ms. Christine Cinnamon
Manager, Environment & Services
Eastern Canada and US
Power Generation and Development, TransCanada
Phone (416) 869-2145 Email: christine_cinnamon@transcanada.com

Chief Executive Officer – TransCanada Energy Ltd

Mr. Russell K. Girling
President & Chief Executive Officer

Project Website: www.NapaneeGS.com

STAKEHOLDER AND ABORIGINAL CONSULTATION

TransCanada has for a long time recognized the importance of consulting with area residents, local communities, Aboriginal groups, government agencies and others in order to learn more about their respective interests, and to share Project information during the course of project development. Stakeholder and Aboriginal consultation activities commenced in October of 2012 and will continue throughout the course of permitting, construction, and into operations. The table below provides a list of key consultation activities/engagement milestones with stakeholders, including citizen's groups, community groups, environmental groups, media, businesses, and others engaged to date.

Description of Stakeholder Consultation Activities/Milestones	Date(s)
Commencement of engagement with local stakeholders including site neighbours and municipal elected officials	October 1, 2012
Meetings with site neighbours, the Mayor and Councillors, as well	October 2012 to August

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Description of Stakeholder Consultation Activities/Milestones	Date(s)
as members of the Town’s Chamber of Commerce, and meetings with the County of Lennox and Addington	2013
Established project voice mail and email box	October 2012
Established a project website	December 2012
Letter to stakeholders announcing the signing of the agreement with the OPA for the Project	December 2012
Presentation to Town Council (Town of Greater Napanee)	January 2013
Notice of Commencement and invitation to first Open House distributed by regular mail and email to stakeholders on contact list	January 2013
Notice of Commencement and invitation to first Open House distributed via hand delivery to area residents and site neighbours	January 2013
Notice of Commencement and invitation to first Open House published in local newspapers	Round 1 – week of January 21, 2013 Round 2 – week of January 28, 2013
Meeting with site neighbours group	January 2013
First Open House	February 11, 2013
Presentation to local groups including Institute of Power Engineers, local community church group, County of Lennox and Addington	February 2013
Conducted a facility tour of the Portlands Energy Centre for Town of Greater Napanee Mayor and members of Council	February 26, 2013
Letter offering to fund a peer review of the ERR sent to Town of Greater Napanee	March 2013
Local TransCanada Project Office opens	May 2013
Second meeting with site neighbours’ group	May 2013
Presentation to members of the Building and Construction Trades of Ontario and Building Trades Union Representatives	May 15, 2013
Jobs Information Session	June 13, 2013
Third meeting with site neighbours’ group	July 2013

Description of Stakeholder Consultation Activities/Milestones	Date(s)
Meetings with key agencies to introduce the Project and discuss various aspects of the project pertinent to their area of interest and jurisdiction including: <ul style="list-style-type: none"> ▪ Ministry of the Environment ▪ Canadian Environmental Assessment Agency ▪ Ministry of the Environment (Kingston Branch) ▪ Cataraqui Region Conservation Authority ▪ Ministry of the Environment ▪ Ministry of the Environment (Air Standards Branch, Approvals Branch, Toronto Office) ▪ Ministry of Transportation ▪ Ministry of the Environment and Ministry of Transportation ▪ Ministry of the Environment and Ministry of Transportation ▪ Ministry of the Environment 	November 20, 2012 January 28, 2013 March 13, 2013 March 13, 2013 April 3, 2013 April 9, 2013 April 19, 2013 July 9, 2013 July 9, 2013 August 16, 2013 October 8, 2013
Architectural and Landscaping Advisory Committee Meetings	August 22, 2013 and September 12, 2013
Invitation to second Open House and notice of release of Draft ERR distributed by regular mail and email to stakeholders on contact list	September 27, 2013 (mail) October 1, 2013 (email)
Notice of Commencement and invitation to second Open House distributed via hand delivery to area residents and site neighbours	September 30, 2013
Notice of Commencement and invitation to second Open House published in local newspapers	Round 1 – week of September 30, 2013 Round 2 – week of October 7, 2013 Round 3 – week of October 14, 2013

The following table provides a list of Aboriginal groups engaged by TransCanada that may be interested in, or potentially affected by, the Project.

Description of Aboriginal Engagement	Date(s)
Contact with Mohawks of the Bay of Quinte First Nation to introduce the Project and Project team members. An invitation to set up a meeting was extended and contact information was	October 24, 2012

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Description of Aboriginal Engagement	Date(s)
provided in the event there were any questions, comments, or concerns.	
Introductory phone call to Mohawks of the Bay of Quinte providing an introduction to the Project and an invitation to discuss the Project.	November 2, 2012
Notification letters sent. The package included an invitation to Open House #2, pamphlets addressing Aboriginal Relations and how TransCanada operates with respect for its stakeholders, Notice of Commencement, Open House #1 Q & A, Napanee Generating Station Fact Sheet, and information displayed at Open House #1. Letters were sent to the following First Nations: <ul style="list-style-type: none"> ▪ Alderville First Nation; ▪ Hiawatha First Nation; ▪ Curve Lake First Nation; ▪ Mississaugas of Scugog Island First Nation; ▪ Mohawks of the Bay of Quinte First Nation; and ▪ Métis Nation of Ontario Region 6. 	February 28, 2013
Contacted Aboriginal communities to follow up on, and request feedback, expression of interest regarding, and whether they had questions regarding the Notice of Commencement that was mailed on February 28, 2013.	March 11, 2013
Contact with Alderville First Nation to set up meeting with Chief and Council.	March 18, 2013
Notification letter and package sent to Kawartha Nishnawbe First Nation.	April 17, 2013
Meeting with Mohawks of the Bay of Quinte CAO to determine the nature of the community's interest in the Project.	April 21, 2013
Meeting with Chief and Council – Mohawks of the Bay of Quinte First Nation. The Chief presented a letter to the TransCanada Project team.	April 24, 2013
Meeting with Alderville First Nation representative.	April 24, 2013
Presentation and Meeting with Chief and Council – Alderville First Nation.	May 10, 2013
Presentation and Meeting with Chief and Council – Mohawks of the Bay of Quinte First Nation.	May 31, 2013

Description of Aboriginal Engagement	Date(s)
Initial preliminary discussion on direction for the Mohawks of the Bay of Quinte’s request for a relationship with TransCanada and content for an MOU / relationship document.	June 14, 2013
TransCanada endeavoured to contact the CAO of Alderville First Nation to discuss and set-up subsequent meetings. He would not be available for a few weeks.	June 19, 2013
Meeting with Mohawks of the Bay of Quinte to discuss programs that TransCanada may want to partner with the community on.	June 24, 2013
Inquiry with Mohawks of the Bay of Quinte about their interest in being present on the first day of field work in the Stage 2 archaeological assessment of Project site. A member was not available to attend at this time.	June 27, 2013
Voice message was left for Mohawks of the Bay of Quinte informing them of the finding of an artifact during the day’s archaeological assessment field work.	June 27, 2013
Inquiry with Mohawks of the Bay of Quinte about their interest in being present on the second day of field work in the archaeological assessment of the Project site. A member was not available to attend at this time.	July 2, 2013
TransCanada provided a response letter to that issued by the Chief to TransCanada on April 24.	July 12, 2013
Site visit by a member of the Mohawks of the Bay of Quinte during archaeological field work in the Project site.	July 31, 2013
Sent invitation to Mohawks of the Bay of Quinte for a representative to participate in Architectural and Landscaping Advisory Committee and notice of first meeting on August 22, 2013.	August 15, 2013
Community Open House for Alderville First Nation.	September 9, 2013
Community Open House for Mohawks of the Bay of Quinte.	September 10, 2013

ENVIRONMENTAL ASSESSMENT AND OTHER REGULATORY APPROVALS AND PERMITTING

The Project is subject to EA requirements set out in Ontario Regulation (O.Reg.) 116/01 (the Electricity Projects Regulation) under the Ontario *Environmental Assessment Act* and subject to the Environmental Screening Process set out in the Ministry of the Environment’s (MOE’s) “Guide to Environmental Assessment Requirements for Electricity Projects”. TransCanada has elected to undertake a more comprehensive environmental assessment and will prepare an

Environmental Review Report (ERR). TransCanada has further voluntarily agreed to develop a draft ERR for agency and public review before the submission of the final ERR. A copy of the Draft ERR and all Supporting Documents are available for review and download on the Project web site (<http://www.NapaneeGS.com/environment/environmental-studies/>) and have been provided to stakeholders.

Other approval or permitting requirements may include:

- Environmental Compliance Approvals (ECA) (for air and noise, and industrial sewage) from the MOE issued under the *Environmental Protection Act (EPA)*.
- Permit from the Ontario Ministry of Natural Resources (MNR) issued under the *Endangered Species Act (ESA)*.
- *Planning Act* approvals, which include Consent to Sever, Minor Variances, Site Plan Approval and acquisition of one or more building permits.
- Aeronautical Obstruction Clearance from Transport Canada.
- Land Use Proposal Submission to Nav Canada for the Project stacks.
- Ontario Ministry of Transportation (MTO) entrance signage permits and/or access/use permits for heavy load transportation on Provincial roads.
- Ontario Ministry of Tourism, Culture and Sport clearance letters for archaeological and cultural heritage resources.
- Cataraqui Region Conservation Authority (CRCA) permits under the *Conservation Authorities Act* O.Reg. 162/06 Generic Regulation and “Regulation of Development, Interference with Wetlands and Alterations to Shoreline and Watercourses”.
- Permit to Take Water (PTTW) issued under the *Ontario Water Resources Act (OWRA)*. TransCanada will operate under OPG’s existing PTTW for the Lennox GS. A temporary permit may be needed for pumping of groundwater during construction.

REGIONAL ENVIRONMENTAL STUDIES

The Project is not located in an area that has been nor is currently the subject of a regional environmental study.

FEDERAL INVOLVEMENT

Financial Support

No financial support will be provided by the federal government for the purposes of carrying out the Project. TransCanada as the Proponent will finance the construction, operation and maintenance of the Project.

Federal Lands

No federal lands will be used for the purpose of carrying out the Project or any granting of interest for purposes of an easement, or right of way, or transfer of ownership of federal land.

Federal Permits or Licences

There are no federal permits or licenses anticipated to be required in order for the Project to proceed either in whole or in part. However, for facilities located within 100 km of the Canada-U.S. border and that potentially have a nitrogen oxide (NO_x), sulphur dioxide (SO₂), suspended particulate matter (SPM), or volatile organic compound (VOC) emission rate of greater than 90 tonnes per year (t/yr), notification is made to Environment Canada pursuant to the Canada-U.S. Air Quality Agreement.

GENERAL DESCRIPTION, CONTEXT AND OBJECTIVES

TransCanada will plan, develop, construct, commission, own, operate and maintain the Project, a 970 MW (net output under average ambient conditions) natural gas-fuelled electricity generating station located on the existing OPG Lennox GS lands. The Project is a combined cycle facility, which uses both gas and steam turbines to effectively and efficiently produce power.

The Project site is approximately 38 ha in size located immediately to the east of Lennox GS on north side of Loyalist Parkway east of County Road 21. The Project and its associated facilities will occupy 11 ha of the western portion of the Project site. Natural gas will be supplied through an existing Union Gas connection (approximately 200 metres (m) north of the Project's generating equipment). Electrical connection will be through Hydro One Network Inc.'s (Hydro One's) existing electrical transmission switchyard located at the Lennox GS site immediately adjacent the Project site and approximately 100 m north of the Project's switch yard. Water supply and water return will be from the existing Lennox GS forebay and to the existing discharge channel, respectively. Also located adjacent to the Project site is an existing rail line. The rail line on the Lennox GS property is owned and maintained by OPG. TransCanada's use of the on-site rail line is governed by their agreements with OPG. Use of the rail line for the Project will be limited to the delivery of select equipment during construction, and it is anticipated that these few incremental trips will result in negligible environmental effects.

The Project will be an essential component of the Ontario electrical system delivering on-demand power to meet the daily workday power requirements, replace retired coal capacity, help manage changes in nuclear capacity due to planned refurbishments/retirements over next 15 years, address rising electricity demand and provide a source of on-demand power to backstop intermittent wind and solar generation. It is expected to start and stop each workday to meet the daily demand for power in the province

REGULATIONS DESIGNATING PHYSICAL ACTIVITIES

The Project is a designated project as per the *Regulations Amending the Regulations Designating Physical Activities*. It is listed under item 2(a) in the schedule of physical activities forming part of the Regulations:

The construction, operation, decommissioning and abandonment of a fossil fuel-fired electrical generating station with a production capacity of 200 MW or more.

PROJECT LOCATION

The geographic coordinates for the centre of the Project site are:

Latitude: 44° 9'3.55"N

Longitude: 76°50'20.53"W

The legal description of land to be used for the Project is as follows:

- Parts of Lots 19, 20, 21 and 22, Concession 1, Geographic Township of South Fredericksburg, Town of Greater Napanee.

The Project site is located entirely on privately-owned land.

The Project is located adjacent to the existing OPG Lennox GS and on lands designated Industrial in the Official Plan for the Town of Greater Napanee. The Amherst Island wind farm development is a known proposed project located approximately 3.5 km from the Project site; however, the Greater Napanee Council recently passed a resolution stating the Municipality is an unwilling host for the development of industrial wind farms.

The closest residences are located along the north side of Loyalist Parkway approximately 1 km northeast of the Project's easternmost component.

PROXIMITY TO FEDERAL LANDS, RESERVES AND TRADITIONAL TERRITORIES

The Project is not located on Federal lands. The closest federal lands include the Millhaven Institute and Canadian Forces Base (CFB) Kingston located approximately 9 km and 30 km east of the Project site, respectively, and CFB Trenton located 60 km west of the Project site. The closest Federal First Nation Reserve lands are the lands of the Mohawks of the Bay of Quinte First Nation located 25 km west of the Project site.

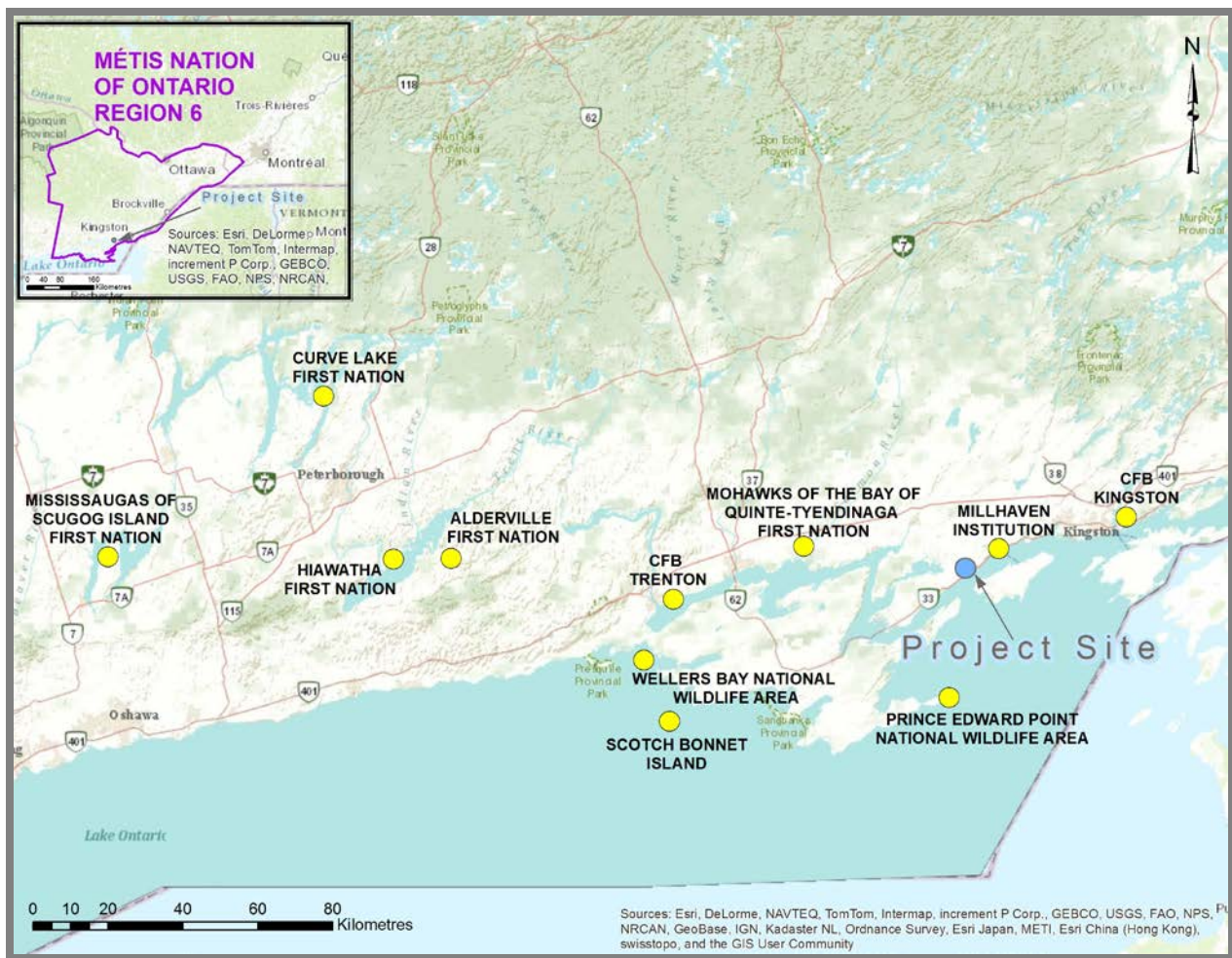
The Mohawks of the Bay of Quinte First Nation, which is based in Tyendinaga Mohawk Territory, is located along the shores of the Bay of Quinte approximately 25 km north and west of the Project site. The next closest First Nations are located approximately 100 km or more from the Project site, including Hiawatha First Nation, Alderville First Nation, Curve Lake First Nation, and Mississaugas of Scugog Island First Nation. In addition to the above is the Kawartha Nishnawbe First Nation. The Kawartha Nishnawbe First Nation community is centred in and around Burleigh Falls in the Greater Peterborough Area and does not have reserve land under the *Indian Act*.

There is one known Aboriginal burial ground located immediately south of the Project site on the south side of Loyalist Parkway.

The Project site is also located within the Métis Nation of Ontario’s Region 6 area.

The Project site is not currently being used for traditional purposes (i.e., hunting, fishing, trapping and collecting plants for medicinal or ceremonial purposes) by Aboriginal peoples or the subject of any land claims.

Figure 4 Project Site and Proximity of Reserve and Federal Lands



PROJECT WORKS AND ACTIVITIES

The Project is capable of generating a net electrical output of 970 MW of electricity at average ambient environmental conditions. The expected net output of 970 MW is derived from two 271 MW gas turbine and generators (GT/Gs) and one 457 MW steam turbine and generator (ST/G) less auxiliary loads (approximately 29 MW) used by the Project. Equipment design and

operation has been selected to prevent and/or minimize effects to the environment. The key pieces of equipment are as follows:

- Two industrial GT/Gs rated nominally at 271 MW each, using natural gas as the only fuel.
- Two horizontal heat recovery steam generators (HRSGs) in multiple-pressure configuration which utilize waste heat in the GT/G exhaust gas to generate steam to feed the ST/G. Two low NO_x duct burners, one in each HRSG. The exhaust flow through each HRSG stack comprises the GT/G exhaust flow along with the exhaust from the duct burner operating at 100%. Each HRSG stack has an inner diameter of 6.4 m and extends 61 m above grade. One ST/G rated nominally at 457 MW. The ST/G accepts steam from the two HRSGs.
- A Selective Catalytic Reduction (SCR) system will be installed within each HRSG to reduce the NO_x emissions from the exhaust gas streams of each GT/G, including that produced in the duct burner exhaust. Under normal operating conditions, the SCR will reduce NO_x emissions to 2.5 parts per million (ppm) leaving each HRSG exhaust stack, when the GT/Gs are operating at and above 60% of GT/G base load, with or without duct firing.
- One rectilinear, multi-fan mechanical draught, evaporative cooling tower. The tower consists of a single bank of 14 cells, one fan per cell providing the means to condense steam from the exhaust of the steam turbine (condensate) thus providing non-contact cooling for the NGS. This is accommodated by continuously circulating water through the condenser (tube side), to condense the entering turbine exhaust steam (shell side). The heated circulating water is routed through the cooling tower and back to the condenser, with heat rejected to the atmosphere in the tower by evaporation. The cooling tower is designed to operate with six cycles of concentration, optimizing use of circulating water supplied from Lake Ontario. The condensate is re-used in the HRSG steam cycle. The cooling tower is approximately 14.5 m above grade, 230 m long and 20 m wide.
- Other auxiliaries, including those providing compressed air supply, electric power supply and distribution, transformers, natural gas filtering, compression and heating, water treatment and purification, and wastewater collection and processing, will exist on-site to support operations of the two GT/Gs, two HRSGs and the ST/G. These other auxiliaries are described below. Primary control of the Project will occur from a main control room located in the administration building on-site.
- One natural gas-fuelled auxiliary boiler equipped with low NO_x burners, exhausting to the atmosphere through a stack extending 40m above grade.
- One emergency standby diesel generator rated at 2 MW, firing ultra low sulphur diesel fuel and exhausting through a stack extending 4.6 m above grade. Emissions were conservatively modelled at these maximum (100% load) conditions, although the diesel

generator will be tested for approximately 1 hour per week at 50% electrical load during normal operation of the Project which results in operation of less than 60 hours per year. This generator will provide power to critical auxiliaries during times when power supply via the Ontario grid is not available.

- One natural gas-fuelled dew point heater (DPH) exhausting through a stack extending 4.6 m above grade.
- Natural gas-fuelled internally suspended, wall-, or roof-mounted comfort heaters for the main buildings with a total capacity not expected to exceed 8GJ/hr HHV (7.5 MMBtu/hr).
- Three electrically driven 3.6 MW natural gas compressors to boost the natural gas pressure.
- Three generator step-up transformers increasing the voltage of the electricity produced by the three on site generators from 21kV to 500 kV.
- One 500 kV switchyard, wherein electricity generated by the Project is connected to the 500 kV Ontario transmission grid.
- One 280 kilowatts (kW) (nameplate) emergency diesel fire pump as part of the fire protection system exhausting through a stack extending 4.6 m above grade.
- One raw water system for supply and treatment located in the pumphouse for the treatment of raw water from the Lennox GS intake channel for cooling, fire protection, and process uses.
- One potable water treatment system for treatment of raw water for potable water usage.
- Two 100% capacity filtration, reverse osmosis (RO) and mixed bed demineralizer water treatment trains to make de-ionized water from raw water for make-up to the steam cycle and other uses.

Site Preparation

The entire Project site will be prepared prior to construction activities and protection measure will be taken in accordance with an Erosion and Sediment Control Plan. These activities include:

- implementation of erosion and sediment control;
- clearing of vegetation;
- blasting, soil excavation and grading;
- construction of laydown, parking areas and temporary access points; and
- construction of temporary road and intermittent creek crossing.

Construction Activities

Construction activities include:

- construction of permanent stormwater management system;
- foundation installation;
- installation of underground utilities;
- construction of buildings and installation of equipment;
- switchyard construction;
- construction of permanent site access point;
- connecting to existing Lennox GS forebay and discharge channel; and
- site restoration and landscaping.

Commissioning Phase

During commissioning, all operating aspects of the Project are tested to ensure they are operating to their required level or guaranteed value. All tests are completed in accordance with equipment specifications and contract performance guarantees. Commissioning and testing of the entire Project is anticipated to take up to nine months.

Operation

The Project will generate electricity using combined cycle technology employing both a gas turbine cycle and a steam turbine cycle. In the gas turbine cycle, air is compressed then heated through the combustion of natural gas. The expansion of gases turns the turbine, which drives a generator, producing electricity. Heat created in the gas turbine cycle, which would otherwise be wasted, is recovered to produce steam used in the steam turbine cycle. This steam is provided to a steam turbine. Similar to the gas turbine cycle, the expansion of steam turns a steam turbine which drives a generator, producing electricity. The addition of the steam turbine cycle increases the amount of electricity generated from a given amount of natural gas which results in greater fuel efficiency and fewer emissions per unit of electricity.

Decommissioning

TransCanada is committed to environmental protection through all Project Phases, including decommissioning. A Decommissioning Plan will be developed in accordance with applicable environmental protection standards to minimize and mitigate the effects of any decommissioning activities prior to decommissioning of the Project.

Decommissioning will entail the dismantling of all systems and structures, removal of all operating equipment, furniture, supplies, electrical cables, buried structures, roads, the demolition of all buildings, management of waste (using licensed waste disposal/recycling firms and licensed facilities) and the restoration of the Project site.

PROJECT PHASES AND SCHEDULE

Site Preparation and Construction: Fall 2014, Winter 2015 until early 2017

Commercial Operation: Fall 2017

Decommissioning: Start Fall 2047 (based on a 30 year operating life)

WASTEWATER COLLECTION, TREATMENT, AND DISCHARGE

Wastewater generated by the Project will consist of the three primary waste streams – industrial wastewater, stormwater runoff, and domestic sanitary sewage.

Cooling tower blowdown along with other process water discharges will be discharged via a new discharge pipeline to the existing Lennox GS discharge channel. Prior to entering the existing Lennox GS discharge channel, effluent treatment using “best available technology” will be used to ensure the effluent will meet MOE regulated effluent criteria (quality and temperature) and that the cumulative effects of discharges from the Lennox GS and the Project will have not have an adverse effect on Lake Ontario receiving waters.

Stormwater runoff generated from impervious areas of the developed site (i.e., building and parking lots) will be routed to local catch basins, and conveyed through adequately designed ditches, swales and subsurface piping to the existing stormwater culvert located to the south-west corner of the site. End-of-pipe stormwater quality control measures will be installed, such as oil/grit separator devices (e.g., Stormceptors) for the removal of any possible oil/grit contaminated runoff prior to discharge to the Lake via the existing culvert under Highway 33. The oil/grit separators will be designed to produce at least an *enhanced* level of treatment (i.e., 80% removal of total suspended solids).

Waste streams resulting from drains located in washroom, kitchen and any other domestic facilities will be collected and conveyed in a totally independent system that will be routed to the existing Lennox GS sanitary sewer collection and treatment system (i.e., sewage lagoons) located north of the Project site.

AIR AND NOISE EMISSIONS

The Project will require an ECA for air emissions from all combustion equipment as required under Section 9 of the Ontario *EPA*. The ECA application will include detailed technical information on both atmospheric emissions (e.g., NO_x, SO₂, CO, SPM, VOCs, ammonia (NH₃), and other trace constituents) from on-site sources and noise emissions from operating equipment.

Air emissions will be assessed by the MOE in consideration of (i) point of impingement (POI) standards (O.Reg. 419/05); (ii) end-of-stack standards (MOE Guidelines A-9 and A-5), and CCME National Emission Guidelines for Stationary Combustion Turbines (CCME 1992) and the National Emission Guideline for Commercial/Industrial Boilers and Heaters (CCME 1998) on which the MOE A-5 and A-9 Guidelines, respectively, were founded, and (iii) Provincial

Ambient Air Quality Criteria (AAQC) (MOE 2012) as well as Canadian Ambient Air Quality Standards (CAAQS) (CCME 2012). The effect of development and operation of the Project is expected to have a minimal effect on the local air quality, as the Project will be designed to meet or be below O.Reg. 419/05, and all other applicable regulatory requirements. Modelling results show that the Project's air emissions are well within those regulatory requirements for all parameters.

Noise emissions have been assessed through comparison to existing noise levels at the closest residential area. Noise emissions from the Project are evaluated against the MOE Noise Pollution Control (NPC) 232 criteria for daytime (45 dBA), evening and night-time operating periods (40 dBA) at the closest residential receptors. Noise levels from the Project are designed to meet or be lower than the MOE criteria at the closest residential receptor and modelling undertaken for the ERR confirms that these criteria are met.

SOLID WASTE

The Project is expected to generate only non-hazardous solid waste. Wastes will be minimized to the extent possible through re-use and recycling programs. All residual wastes remaining after diversion programs (e.g. food waste, packaging material) will be collected regularly by licensed contractors and transferred to appropriately licensed off-site disposal facilities. No waste disposal facilities will be located on the Project site.

LIQUID WASTE

Liquid waste streams periodically generated include oil and grit collected in the oil/water and oil/grit separators or gas turbine drain tank, and detergent-laden water (gas turbine water wash fluid) which is not consumed in the wash process. Oil collected and retained in the oil/water and oil/grit separators and oil collected and retained in the gas equipment drains will be removed from collection vessels via vacuum truck and disposed of at an appropriate off-site facility. These wastes will also be collected by licensed contractors and disposed at appropriately licensed off-site facilities.

PHYSICAL AND BIOLOGICAL SETTING

The Project site is located on an existing power generating facility site of approximately 485 ha surrounded by a rural farming community. The Project site (approximately 38 ha) is comprised of roughly 30% cultivated agricultural lands (location of construction laydown area), 30% undeveloped wooded areas with poor drainage, and 30% that forms part of Lennox GS storage yards (location of the major Project components), the Union Gas natural gas pipeline and connection yard, and a Rogers' communications tower.

The Project site zoning permits non-nuclear electrical power generation, and has road and adjacent rail access, with existing infrastructure such as electrical transmission and natural gas pipeline interconnections located at the site.

The regional geology consists of a thin layer of glacial silt and/or clay till over limestone of the Ordovician Veralum Formation. The limestone bedrock is present at depths ranging from 0.15 to 3.7 m below grade. Fill soils, comprising silty material with some gravel and weathered bedrock, were occasionally present to depths up to 1.16 m. Native soils encountered in the boreholes were variable, ranging from topsoil to cobbles to silty clay to sandy silt till. Regional groundwater flow is generally south towards Lake Ontario. Groundwater at the Project site is largely within bedrock - generally flowing south towards Lake Ontario.

The area surrounding the Project site has a climate similar to other parts of southern Ontario near the Great Lakes. The region is characterized by pronounced seasonal differences in weather and by a highly variable day-to-day weather pattern. The lowest temperatures occur in January and the highest in July. The late summer and fall months receive the highest monthly precipitation, with August, October and November receiving the most, on average.

The Project site consists of the Lennox GS storage yards, upland cultural communities consistent with the disturbed nature of this industrial site and active agricultural lands. No breeding amphibians were recorded within the Project site and no suitable breeding habitat occurs within the Project site. No Blanding's turtle or nesting areas of common snapping turtle were found on or close to the Project site. A total of 50 species of breeding birds was recorded from the site that includes a wide range of species from raptors to shorebirds to song birds. Within the Project site there are two bird species recorded listed as Threatened under the provincial *ESA*. These are barn swallow and eastern meadowlark. The Project site is within an area known for concentrations of migratory birds. A Provincially Significant Wetland feature that supports many wildlife functions is located within 400 m of the Project site and the drainage feature from this wetland traverses the Project site.

A total of 19 fish species were collected during Fall, Spring and Summer gillnetting program conducted in the vicinity of the Lennox GS discharge channel outlet to the Lake and the Lennox GS lake intake. The 19 fish species are typical of the Bay of Quinte dominated by yellow and white perch, and alewife.

Few fish were observed in the existing Lennox GS forebay and consisted of a few individuals of species such as round goby, an invasive species, and solitary or small schools of juvenile yellow perch. No aquatic macrophytes were observed in the Lake Ontario nearshore proximate to the Project site or in the Lennox GS forebay and discharge channel. Benthic species in the Lake were dominated by several chironomid species, quagga mussels and tubificid worms.

There is a small intermittent creek which runs through the Project site providing drainage for the Lennox Hydro Provincially Significant Wetland to the north and the Lennox GS sewage treatment ponds. Water quality in this creek is considered to be good based on the sampling undertaken for the Project. The intermittent creek, however, provides marginal fish habitat due to its intermittent nature and the multiple barriers to both upstream and downstream movement.

The Fall, Spring and Summer water quality program indicated the lake water off shore of the Project site meets Provincial Water Quality Objectives (PWQOs) established for the protection of all forms of aquatic life. Water chemistry results for samples collected in Lake Ontario compared with those sampled in the existing Lennox GS forebay and discharge channel.

POTENTIAL EFFECTS TO FISH AND FISH HABITAT

The Project is not likely to cause any changes to the environment that would affect fish or fish habitat as defined in the amended *Fisheries Act*. A summary of potential effects on fish and fish habitat from construction of the Project intake and discharge system, impingement and entrainment, and the effluent discharges (thermal and chemical) are provided below.

Potential Effects During Construction

No aquatic features will be removed during the construction of the Project. Moreover, since the Project will be using the existing Lennox GS forebay and discharge channel, there are no expected fisheries issues associated with habitat loss related to “in-water” work construction activities in the Lennox discharge channel or forebay.

There is a requirement for a temporary road crossing of the intermittent creek between the Lennox Hydro Provincially Significant Wetland and Lake Ontario. However, this intermittent creek provides marginal fish habitat due to its intermittent nature and the multiple barriers to both upstream and downstream movement. A temporary road crossing requiring the installation of one or more culverts in the intermittent creek should have minimal effect with adherence to CRCA permit conditions, including the establishment of a small buffer zone and adherence to the Department of Fisheries and Oceans in-stream timing and operational guidelines.

Erosion and sediment controls, including the development of an Erosion and Sediment Control Plan, will be implemented in parallel with stormwater management controls. Both the Erosion and Sediment Control Plan and stormwater management system will ensure there is an enhanced level of treatment (i.e., 80% long-term average total suspended solid removal) of the stormwater prior to discharge from the Project site. A Spills Emergency Preparedness and Response Plan will also be prepared in order to mitigate effects in the event of on-site spills. This Spills Emergency Preparedness and Response Plan will be designed to prevent oil and chemical spills from affecting the aquatic environment.

Overall, based on the mitigation measures, the effects of construction of the Project on the aquatic environment are expected to be localized, temporary and negligible.

Potential Effects from Impingement and Entrainment

Field studies conducted offshore of the Project location in the Fall of 2012, and Spring and Summer of 2013 indicate the presence of important commercial and recreational species including yellow perch, lake trout and walleye, as well as forage fish that support them such as alewife. However, with the exception of juvenile yellow perch, none of these species were observed in the Lennox GS forebay and are unlikely to be drawn into the Lennox GS forebay during the Project operation given the low intake flow velocity and the expected minor increase in water draw of less than 2% of the total cooling water draw for Lennox GS.

Fish that were observed in the forebay were of low abundance and were comprised of solitary round goby and juvenile yellow perch. The intake pipe for the Project will be designed so that approach velocities in front of the intake pipe will be low enough to allow the few fish that exist in the forebay to avoid impingement and entrainment. No adverse effect from impingement and entrainment is anticipated.

Effects from Discharge

The effects of the Project's thermal discharge on representative fish, benthic macroinvertebrates and aquatic macrophytes present in the discharge area are expected to be minimal based on existing temperature data collected as well as modeled results. Where data are available, there is no evidence of either Maximum Weekly Average Temperature, representative of long-term chronic exposure, or short-term 24-h maximum temperature benchmark exceedances relative to the actual temperature data collected for the representative species assessed. Temperature increases are expected to be minimal and the area of influence would be very localized. Mixing would occur very quickly with Lake Ontario water.

Similarly, thermal loadings to the aquatic environment are not expected to affect fisheries since temperature increases are predicted to be localized and mixing will occur very quickly with Lake Ontario water. Fish are also not expected to be affected by thermal shock as short-term temperature differentials are predicted to be minimal. No adverse effects are predicted on aquatic organism.

The quality of the cooling tower blowdown from the Project will adhere to the Municipal Industrial Strategy for Abatement (MISA) requirements. The effluent, limits which are similar to those applied to Lennox GS under the MISA regulation, will be met before the Project effluent enters the Lennox GS discharge channel.

AQUATIC SPECIES (AS DEFINED IN THE SPECIES AT RISK ACT)

There are no known aquatic species as defined in the *Species at Risk Act* that will be adversely affected by the project. Sampling results from b Fall, Spring and Summer fish surveys conducted in the Lake, and Lennox GS forebay and discharge channel using different gear types have not indicated the presence of any Species at Risk (SAR).

MIGRATORY BIRDS (AS DEFINED IN THE MIGRATORY BIRDS CONVENTION ACT)

The Project site is within an area known for concentrations of migratory birds and the proposed Project (stacks and cooling tower) may interact with migratory birds or potentially disturb migratory bird habitat. In the development of the Project site, a number of mitigation measures will be implemented to address the potential for interactions between migratory birds and Project related activities. TransCanada will ensure that the clearing of vegetation and any proposed work activities near migratory bird habitat will be completed outside of the active breeding season in compliance with the regulations and guidelines of the *Migratory Birds Convention Act*.

The heat recovery steam generator stacks and cooling tower are at relatively low heights that are unlikely to result in bird strikes. Nevertheless, mitigation measures (such as lighting systems for the stacks that are engineered not to attract migrating birds) will be implemented using established good industry management practices for the Project during operations to minimize the potential for adverse effects to migratory birds as defined in the *Migratory Birds Convention Act*.

There are no concerns associated with birds on Amherst Island and proximity to the Project site.

POTENTIAL EFFECTS ON FEDERAL LANDS

The Project will have no adverse effect on federal lands, a province other than Ontario, or outside of Canada.

POTENTIAL EFFECTS ON ABORIGINAL PEOPLES

The Project is not anticipated to have any potential adverse effects on Aboriginal peoples, including adverse effects on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

There is a known Aboriginal burial ground located south of the site on the south side to Loyalist Parkway. The Project has no potential to adversely affect on the burial ground or use of those lands. A single Aboriginal pre-contact projectile point was discovered on the Project site as part of field studies for this Project and has been identified as an isolated findspot. The Mohawks of

the Bay of Quinte were notified of the discovery of the findspot. Results of the Stage 1 and 2 Archaeological Assessment, determined that the findspot where the Aboriginal pre-contact projectile point was recovered does not require any further assessment and that there are no further archaeological concerns for the Project site. No negative effects are anticipated on traditional lands and resources and therefore mitigation will not be required.