TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON SEPTEMBER 24, 2019**
FROM:	**KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**
SUBJECT:	**LANDFILL GAS (LFG) UTILIZATION: NEXT STEPS IN THE DEVELOPMENT OF A RENEWABLE NATURAL GAS (RNG) FACILITY**

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer and on the advice of the Director, Environment, Fleet and Solid Waste the following actions **BE TAKEN** with respect to potentially supplying FortisBC Energy Inc. with Renewable Natural Gas (RNG) created from landfill gas (LFG) from the W12A Landfill:

a) the Civic Administration **BE AUTHORIZED** to release a Request for Proposals to develop a RNG facility to convert landfill gas from the W12A Landfill to RNG; and,

b) Civic Administration **BE AUTHORIZED** to undertake all administrative acts that are necessary in connection with this project.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

Relevant reports that can be found at www.london.ca under City Hall (Meetings) include:

- Landfill Gas Utilization – Update on Feed-In Tariff (FIT) Program Application for a 500kw Landfill Gas Power Plant & Request for Authorization to Execute Fit Contract, October 24, 2017 meeting of the Civic Works Committee (CWC), Agenda Item #16.

- Municipal Greenhouse Gas (GHG) Challenge Fund Applications, October 24, 2017 meeting of CWC, Agenda Item #15.

- Local Renewable Electricity Generation Projects seeking Ontario Feed-In Tariff Contracts Municipal Council Blanket Support Resolution Landfill Gas Projects on Active & Closed Landfill Sites Feed-In-Tariff (FIT) 5.0 Prescribed Forms, October 31, 2016 meeting of the Planning and Environment Committee (PEC), Agenda Item #3.

- Landfill Gas Utilization Update and Next Steps, October 4, 2016 meeting of the CWC, Agenda Item #12.

- Landfill Gas Utilization Status of Opportunities and Next Steps, March 29, 2016 meeting of the CWC, Agenda Item #16.

COUNCIL'S 2019-2023 STRATEGIC PLAN

Municipal Council has recognized the importance of solid waste management in its 2019-2023 - Strategic Plan for the City of London as follows:

Building a Sustainable City
London has a strong and healthy environment (Increase waste reduction, diversion and resource recovery)

Growing our Economy
London is a leader in Ontario for attracting new jobs and investments (Increase partnerships that promote collaboration, innovation and investment)

Leading in Public Service
Londoners experience exceptional and valued customer service (Increase community and resident satisfaction of their service experience with the City)

BACKGROUND

PURPOSE

The purpose of this report is to obtain authorization for City staff to release a Request for Proposals to develop an RNG facility to convert landfill gas from the W12A Landfill to RNG.

CONTEXT

Addressing the Need for Action on Climate Change
On April 23, 2019, the following was approved by Municipal Council with respect to climate change:

> *Therefore, a climate emergency be declared by the City of London for the purposes of naming, framing, and deepening our commitment to protecting our economy, our eco systems, and our community from climate change.*

Development of an RNG facility at the W12A Landfill will further reduce greenhouse gas (GHG) generation (beyond flaring) since RNG injected into the pipeline directly replaces the use of fossil fuel natural gas. It is expected a RNG facility will reduce GHG emissions by 15,500 to 18,500 tonnes of CO_2 every year (equivalent to removing 3,900 to 4,600 vehicles from the road) on an annual basis.

Landfill Gas Collection and Flaring at the W12A Landfill
Landfill gas is produced by the anaerobic decomposition of organic waste material within the landfill and typically consists of about 50 percent methane. Methane is a potent greenhouse gas (GHG) with a global warming potential 25 times greater than carbon dioxide. Collecting and burning methane at the landfill site and converting it to carbon dioxide reduces its global warming impact by about 96 percent.

Landfill gas collection and destruction is now a provincial regulatory requirement for larger landfills like W12A, which came into full effect on June 2016. Prior to this the City of London collected and flared landfill gas on a voluntary basis since 2004.

Since 2004, the landfill gas collection and flaring system has burned about 48,000 tonnes of methane, which has avoided the release of 1,190,000 tonnes of GHG emissions in terms of equivalent carbon dioxide. In 2018 alone, the flare avoided the release of about 96,000 tonnes of GHG emissions – the equivalent of taking 24,000 cars off the roads.

Previous Work on Landfill Gas Utilization Projects
Between 2010 and 2015 there have been several attempts to develop a landfill gas utilization project at the W12A Landfill. During this time, City staff have submitted complete details as part of various application processes and continue to meet all the technical requirements for the gas utilization projects. Utilization projects investigated include electrical power generation projects, greenhouse projects and RNG projects. The challenges associated with successful development of the previous projects that were beyond City control have been:

- Regional electricity transmission constraints;
- Electricity transformer station capacity constraint;

- The Ontario Energy Board's previous rejection of a proposal to implement an RNG premium payment proposed by Enbridge and Union Gas; and
- Changing rules and application processes by the former Ontario Power Authority for renewable electricity generation.

Recent Council Direction and Outcomes
In October 2016, Civic Works Committee and Council reviewed existing potential landfill gas utilization options for W12A Landfill and subsequently directed staff to submit an application to the Independent Electricity System Operator's Feed-In Tariff (FIT) Program for a 500 kilowatt landfill gas power plant which would use about 20 percent of the annual landfill gas produced. In addition, staff were directed to examine options for the production of RNG from the remaining volume of landfill gas at the W12A Landfill.

In 2017 the City was awarded and signed a FIT contract for a 500 kilowatt landfill gas power plant.

In April 2018, Civic Works Committee and Council authorized staff to submit a proposal to Union Gas's *Renewable Natural Gas Supply Request for Proposals*. The business case for the proposed project showed financial, environmental and social benefits to the City with limited risks. The Union Gas program to buy and inject RNG into their system for ten years was partially based on funding from the former provincial GHG cap and trade system.

Change in Provincial Direction
In June 2018 a new Conservative provincial government took office. Shortly thereafter the province cancelled a number of renewable energy contracts including the contract with the City to build a 500 kilowatt landfill gas power plant. The province also cancelled the provincial GHG Cap and Trade system which resulted in Union Gas not proceeding with any of the proposals submitted to them to provide RNG.

These changes left the City without a utilization project to manage over 2,000 m^3/hour (1,200 ft^3/minute) of landfill gas being produced at the W12A Landfill.

DISCUSSION

FortisBC Energy Inc. RNG Request for Proposals
FortisBC Energy Inc. ("FortisBC") is one of the first utilities in North America to have an approved program for the supply and delivery of RNG to its customers. Currently FortisBC has five RNG supply facilities operating in British Columbia but due to the continued growth and success of the approved RNG program, FortisBC needs additional RNG supply to meet demand.

In June 2018, Fortis BC initiated a Request for Expression of Interest ("REIO") process for new RNG supply projects. The REIO process gave preference to projects in British Columbia but would also consider projects within Canada and the United States. With the cancellation of the existing City landfill gas utilization projects, staff responded to the REIO. Responding to the REIO did not put the City under any obligation to enter into discussions, negotiations or agreements for the sale of RNG. This project has similar environmental and social benefits, as well as the potential for equal or better financial benefits than the previous proposal to sell RNG to Union Gas.

Status of FortisBC REIO Submission
Most organizations submitting a successful EOI to FortisBC were asked to respond to a Request for Proposal in the Fall of 2018. However, based on the City's EIO, FortisBC proposes to proceed with direct negotiations with the City.

FortisBC is currently developing the procedures and agreements that will be acceptable to the British Columbia Utilities Commission for them to accept RNG from Ontario. This process has not been concluded. Provided FortisBC is successful, they would want to begin receiving the RNG from London as early as July 1, 2021.

To achieve this time line, FortisBC would like to begin negotiations on a formal agreement with the City. The City will still need to develop the RNG facility after any agreement is signed which would take up to 18 months or longer to design, build and commission.

RNG Facility Experience in Canada

According to information provided by the Canadian Biogas Association in 2017 (City of London is a member), there are currently three RNG facilities using landfill gas as the energy source operating in Canada and three more in the development stage (that may now be operating). There are several other operating RNG facilities at other facilities including the City of Hamilton (wastewater treatment facility).

The operating RNG facilities at landfill sites are:

- FortisBC RNG facility at the Kelowna Landfill (capacity to heat 530 homes/year)
- FortisBC RNG facility at the Salmon Arm Landfill (capacity to heat 170 homes/year)
- Waste Connections RNG facility at the Terrebonne Landfill (capacity to heat 26,000 homes/year)

To put these three existing RNG projects into perspective, the proposed RNG facility at the W12A Landfill would have the capacity to produce 1,150 cubic metres of RNG per hour, or the capacity to heat around 4,600 homes per year.

The US Environmental Protection Agency's Landfill Methane Outreach Program (LMOP) website and database was used to find an RNG project of similar capacity to the one being proposed for the W12A Landfill. According to this database, the City of Billings, Montana has a RNG facility that produces 895,000 cubic feet of RNG per day (or 1,020 cubic metres per hour).

Figures 1 and 2 illustrate the scale of the RNG facility in Billings Montana, and based on these images, the RNG facility of this capacity at the W12A Landfill would require a space of approximately 2,000 square metres. This is about 2.5 times the area of the current LFG flare fenced compound at the W12A Landfill (Figure 3).

Figure 1 - RNG Facility in Billings, Montana, USA (Source: City of Billings website)

Figure 2 - RNG Facility in Billings, Montana, USA (Source: Google Maps)

Figure 3 – Current W12A Landfill gas flare which demonstrates the available space to for future facilities (Source: City Map)

Next Steps

As noted above only a handful of RNG facilities have been constructed in Canada. These are complex facilities that require specialized knowledge and expertise to design, build and operate. There are only a few companies in Canada with the capabilities to develop an RNG project. Considering the above, it is recommended that the City release a Request for Proposals to develop a RNG facility to convert landfill gas from the W12A Landfill to RNG. Staff will be engaging outside consultant(s) to assist with the development of the RFP.

PREPARED BY:	**PREPARED AND SUBMITTED BY:**
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