



Staff Report

Infrastructure and Public Works

Report To: Committee of the Whole
Meeting Date: July 8, 2019
Report Number: CSPW.19.057
Subject: Leachate Management Quarterly Update – July 2019
Prepared by: Jeffery Fletcher, Manager of Solid Waste and Special Projects

A. Recommendations

THAT Council receive Staff Report CSPW.19.057, entitled “Leachate Management Quarterly Update – July 2019”;

AND THAT Council endorse proceeding with a sole source negotiated procurement of the Odomatic System from Environmental & Power Solutions Inc. for treatment of leachate odours and based on the successful trials;

AND THAT Council approve the creation of a \$50,000 capital budget for the installation of an electrical service extension at the Landfill Site to be funded from 2019 taxation.

B. Overview

Town Council requested on February 7, 2019 that Staff provide regular quarterly updates on the progress of the Leachate Management Project. This Report provides the update to end of June 2019. As well, the Report discusses an opportunity to reduce current operating costs.

C. Background

To determine the long-term solution for leachate management, the Town completed a Municipal Class Environmental Assessment in July 2017, which after studying various options, the preferred solution as determined by the study findings and adopted by Town Council was pumping leachate from the Disposal Site to the Thornbury Wastewater Treatment Plant (TWWTP).

A February 2019 Staff Report (CSPW.19.021) provided additional background information on leachate management to Council. During budget deliberations Council directed Staff to proceed with examining specific components of the leachate management design.

Staff have executed a change in scope with the project engineering consultant to reallocate funds from final design, tender and contract administration and construction monitoring tasks.

The following new tasks have been identified to examine and report back to Council prior to proceeding with a management option final design:

- Leachate and septage pre-treatment, pumping and transport;
- Leachate attenuation and retention;
- Hydro connection and groundwater pumping at landfill;
- Clarksburg servicing;
- Forcemain break monitoring; and
- Re-initiation of project and justification to Town Council.

Interim Odour Management

Since the spring of 2018, Landfill Site operations have been pre-processing leachate to eliminate significant odour generating conditions (namely Hydrogen Sulphide, H₂S). An ad hoc system of mechanical aeration and chemical dosing was developed and implemented by Town Staff.

This pre-processing system has been effective in reducing odours however it is quite operator intensive and has the potential for health and safety risks plus is costly due to equipment rentals and diesel fuel use. Staff have been conducting trials with an alternative technology that has the potential to significantly reduce costs and eliminate environmental and health and safety risks.

Hydro Extension

Currently Landfill operations employ a diesel power air compressor, hydraulic pump and generator. The compressor aerates the leachate within two separate tankers. The hydraulic pump lifts the leachate out of the wet well and into aeration tankers. The on-site generator provides power to a submersible pump to redirect water away for the termination berm. Combined, along with the tanker rentals, these items are costing the Town \$4,900 per month or \$58,800 per year. These diesel powered pieces of equipment also consume approximately \$33,500 in fuel annual.

Town Staff have trialed an innovative technology with Environmental & Power Solutions Inc. The “Odomatic” technology has been effective in lab tests and trials in eliminating H₂S and the associated odours. Staff have determined that installation of Hydro combined with the “Odomatic” technology will save net annually \$76,500 in equipment rental, chemical additives and the diesel to power equipment. Table 1 has compared pre-processing options and the installation of hydro combined with the “Odomatic” system has the largest cost saving.

D. Analysis

Leachate Management Pre-Design

Staff will continue to update Council on the development of the pre-design work areas outlined above. This additional investigation and will culminate in a report and presentation to Council. It is anticipated Council will provide direction to Staff regarding how the design should proceed and a new scope of engineering will be developed for incorporation into the 2020 Town Capital Budget.

The Director of Infrastructure and Public Works authorized, in May, a Scope Change with MTE to re-allocate \$86,000 from the existing Engineering Services Agreement to undertake the additional work. This new work is already underway.

Interim Odour Management

Part of the engineering exercise will include a solution for eliminating leachate related odours and minimizing H₂S levels. Staff have been working directly with a promising and unique technology that has shown proven results in a lab trial and on-site trial. The trialed technology has displayed results in wastewater plant applications and staff have been working with the technology holder to develop a pre-processing system that will effectively eliminate leachate H₂S.

The technology is known as “Odomatic” and the use of this system promises to have significant advantages over the existing system of chemical dosing and extended aeration. The list below outlines the operational advantages:

- Reduction in pre-processing time requirement (½ hours versus 8 plus hour);
- Reduced need for staff overtime;
- Reduced health and safety risks;
- Elimination of fugitive H₂S during aeration;
- Reduced operational cost;
- Simplified operations and better allowance of winter operations;
- Reduced GhG emissions (4 tonnes annually with hydro installation);
- Streamlining of other operations included berm water pumping; and
- Reduced operational footprint.

The current extended aeration pre-treatment system consists of the following components:

- Diesel compressor rental
- Diesel generator rental
- Two 50 m³ tanker trailer rentals
- Diesel hydraulic pump rental
- Chemical additives
- Portable diesel fuel cell

Implementation of the “Odomatic” system combined with hydro installation proposes to eliminate all of the items listed above and be replaced with one contained electrically power system.

The “Odomatic” system uses an Oxidant technology. Town Staff have worked with Environmental & Power Solutions Inc. to develop their technology to operate in the Town’s particular scenario. The technology and collaboration has been unique. No other comparable pre-processing options exist and based on the success of the trials Staff recommend using the “Odomatic” system in a full scale pilot to be sole sourced from Environmental & Power Solutions Inc. This will also allow for the Town to test the technology prior to and to incorporate into the final forcemain design.

Justification for the sole source purchase is in accordance with Section 9 (1) of the Town Purchasing of Goods and Services Policy, which reads “one supplier/contractor possessing the unique ability or capability to meet the requirements of the Town due to a patent”. As part of the sole source negotiation an operating strategy will be created to satisfy the requirements of the Town Policy.

Rental of the “Odomatic” system would be a new cost, however the comparable operational cost reductions outlined in the Financial Impact section are significant.

Staff also recommends that Council endorse extending hydro service at the Town Disposal Site to supply power to the pre-processing system and berm pumping for an estimated upset limit of \$50,000 to be funded from annual operational cost savings. The hydro extension work will be procured through a competitive tender process.

The implementation of hydro extension and the use of the “Odomatic” system would create significant cost savings over the current operations. The simple payback period for hydro installation is 8 months. The options and cost savings are outline in the table in the Financial Impact Section.

Worker and Environment Safety

Town Staff is recommending the implementation of an alternative to the current pre-processing system. The existing pre-processing procedure has inherent environmental, public and worker health and safety risks. These risks could all be eliminated with the installation of the “Odomatic” system and the use of hydro power.

A significant benefit of the “Odomatic” system is the elimination of fugitive H₂S. The “Odomatic” system contains and eliminates the uncontrolled release of H₂S into the surrounding atmosphere.

E. The Blue Mountains Strategic Plan

Goal #5: Ensure Our Infrastructure is Sustainable

Objective #2 Avoid Unexpected Infrastructure Failure and Associated Costs and Liability

F. Environmental Impacts

The installation of hydro will eliminate the burning of an estimated 35,000 litres of diesel fuel per year, which has a direct greenhouse gas reduction of 4 tonnes of carbon dioxide per year. Hydro use has a GhG footprint, however the Ontario grid emission levels are very low due to the mix of nuclear and renewables.

There will be additional benefits to worker environment related to the elimination of engine exhaust and fuel handling.

G. Financial Impact

Leachate Management Pre-Design

The scope change related to Council's request to further examine leachate routes and design elements has reallocated \$86,000 from the existing Leachate Forcemain Design Project Engineering budget. No new funds have been created to complete this work, funds will be reallocated from unspent sections to complete work on the six priority works areas described in the Background Section of this Report.

Interim Odour Management

As outlined below the proposed "Odomatic" system with the extension of hydro has the potential to reduce the landfill operational budget by \$76,500 annually compared to current operations. Hydro extension would be an additional capital expense estimated at \$50,000, however the simple payback is financially advantageous with a recovery of costs in approximately 8 months. If a leachate forcemain or other management solution is put into place hydro extension would be part of that work. A leachate management solution, such as a forcemain, would not be installed and operational until late 2021. Hydro extension also eliminates the use of diesel and a generator for the pumping of water away from the termination berm. Those associated costs and savings are included in the table below.

2019 Budget and Forecasted Cost Costs

The below chart looks at the 2019 approved budget versus forecasted costs to August. Staff have forecasted an additional few months as it will take some time to install the hydro and switch over to the "Odomatic" system, if approved by Council. This leaves \$51,025 for the remainder of 2019.

Expense Type	2019 Budget	Forecasted Cost to the end of Aug 2019	Remaining 2019 Budget
Equipment Rental	\$58,800	\$28,515	\$30,285
Chemicals	\$22,200	\$15,410	\$6,790
Fuel	\$33,500	\$19,550	\$13,950
Total	\$114,500	\$63,475	\$51,025

2019 Forecasted Year-end Costs for each Option

This chart looks at the four options and what the costs would look like for the remaining five months in 2019. The bottom-line of the chart gives the estimated operational savings for 2019 under each of the four options.

Expense Type	Current System	Odomatic with Diesel Power	Current System with Hydro	Odomatic with Hydro
Equipment Rental	\$21,760	\$18,775	\$17,185	\$-
Chemicals	\$11,005	\$-	\$11,005	\$-
Fuel	\$13,975	\$13,975	\$-	\$-
Odomatic	\$-	\$12,500	\$-	\$12,500
Hydro	\$-	\$-	\$3,350	\$3,350
Total	\$46,740	\$45,250	\$31,540	\$15,850
Forecasted Cost to August	\$63,475	\$63,475	\$63,475	\$63,475
2019 Forecasted Total	\$110,215	\$108,725	\$95,015	\$79,325
2019 Budget	\$114,500	\$114,500	\$114,500	\$114,500
2019 Operational Savings	\$4,285	\$5,775	\$19,485	\$35,175

If Council approves the Odomatic System and the installation of the hydro service the 2019 Operational Savings of \$35,175 will be required to fund these costs. An additional \$14,825 is still required to fully fund the hydro installation in 2019.

Staff have forecasted the Landfill’s Fees and Charges and Leachate Treatment cost which are estimate to end the year-end over-budget (Fees and Charges) and under-budget (Leachate Treatment) by more than the \$14,825 required.

Staff are therefore recommending that the 2019 operational savings and increased revenues be used to fully fund the \$50,000 budget for the hydro installation.

Annualize Costs

This chart annualize the costs over a full year period to establish a go-forward budget requirements for each of the four options.

Expense Type	Current System	Odomatic with Diesel Power	Current System with Hydro	Odomatic with Hydro
Equipment Rental	\$58,800	\$18,000	\$40,800	\$-
Chemicals	\$22,200	\$-	\$22,200	\$-
Fuel	\$33,500	\$33,500	\$-	\$-
Odomatic	\$-	\$30,000	\$-	\$30,000
Hydro	\$-	\$-	\$8,000	\$8,000
Total	\$114,500	\$81,500	\$71,000	\$38,000

By not only switching to the Odomatic System as well as installing a hydro service the Town could realize \$76,500 in annualized savings. This is a conservative estimate as the cost of fuel is hard to forecast however it is expected to increase in cost as the Carbon Tax increases annually.

H. In Consultation With

Sam Dinsmore, Deputy Treasurer/Manager of Accounting and Budgets
Serena Wilgress, Manager of Purchasing and Risk Management

I. Public Engagement

The topic of this Staff Report has not been subject to a Public Meeting and/or a Public Information Centre as neither a Public Meeting nor a Public Information Centre are required. Comments regarding this report should be submitted to Jeffery Fletcher, managersolidwaste@thebluemountains.ca.

J. Attached

None

Respectfully submitted,

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