STAFF REPORT: Infrastructure and Public Works

REPORT TO:	**Committee of the Whole**
MEETING DATE:	**May 16, 2016**
REPORT NO.:	**CSPW.16.069**
SUBJECT:	**Budget Increase for Leachate Management and Advancement of Environmental Assessment**
PREPARED BY:	**Jeffery Fletcher, Manager of Solid Waste and Environmental Initiatives**

A. Recommendations

THAT Council receive Staff Report CSPW.16.069, "Budget Increase for Leachate Management and Advancement of Environmental Assessment";

AND THAT Council approve increasing the 2016 landfill operation Budget for leachate haulage by $158,820 from $61,250 to a total of $220,070;

AND THAT Council approve the increase of the leachate haulage contract with Region of Huronia Environmental Services by $165,050 from $54,950 to a total of $220,070, excluding taxes, for 2016;

AND THAT Council approve increasing the 2016 landfill operation Budget for leachate treatment by $136,500 from $45,500 to a total of $182,000

AND THAT Council approve advancing the Leachate Management Environmental Assessment to 2016 from the 2017 budget year.

AND THAT Council approve funding the $35,000 Environmental Assessment from the Landfill Reserve.

B. Background

The new landfill cell completed October 2015 uses a liner and leachate collection system. Collected leachate (rain water and moisture from incoming waste) must be removed from the cell by tanker truck and hauled for treatment at the Town Craigleith Waste Water Treatment Plant.

The anticipated annual production of leachate, as identified during the site design process, was 7,000 cubic metres per year. In the first 3 months of this year haulage trucks have already moved 9,268 cubic meters of leachate.

A tender was completed in 2015 for 2016 leachate haulage service for 7,000 cubic meters of haulage. The total tender price for 2016 service was $54,950. Current leachate generation has exceeded that value by $17,800.

The leachate is being generated at a higher rate than reported in the Landfill Expansion Environmental Screening Report prepared by the Town's Consulting Engineer. Based on the leachate hauled to the end of March and observing the average and year to date precipitation amounts Town Staff have identified that total generation for this year can be expected to be 25,000 cubic metres, 3.5 times the engineer's estimate of 7,000 cubic metres. Annual precipitation rates are slightly higher year to date than average. And, March was 2.5 times wetter than the average month of March. However, this higher than average precipitation does not fully explain the increased volume over the estimate.

Leachate generation is also linked to the volume of waste in the landfill cell. Currently, the cell has only 5 months of disposed tonnes (approximately 1000 cubic metres). The total cell capacity is approximately 50,000 cubic metres. A larger volume of waste acts to absorb rainfall and slow the rate of production. With relatively very little waste currently in place each rain event has an immediate impact on leachate production. However, this lack of absorption also does not fully explain the discrepancy from the design estimate.

Under normal precipitation levels annually the new disposal cell area will collect 17,350 cubic metres of water. The new cell was installed in August of 2015, using the actual monthly precipitation rates from August 2015 to March 2016 the new cell should have collected 12,200 cubic metres of water (rain and melted snow). From October 2015 to March 2016, 11,500 cubic metres of leachate have been removed from the new cell.

Two factors may be contributing to the significant increase in leachate generation for 2016. Firstly, the design estimate appears to have been too low for day one operation. Secondly, but inconclusively, the cell was installed in August 2015 and has effectively been collecting precipitation since that time. Albeit that the cell was to be pumped dry prior to waste being placed, it is possible a portion of the additional leachate is accumulation from August until November 2015, when the haulage started.

The Town's Engineering Consultant, Golder Associates, has suggested the additional leachate could be a result of moisture accumulation between cell completion and the start of haulage. Golder has provided the Town with the results of a leachate generation model that predicts only 6,997 cubic metres per year. Golder is suggesting the model used assumes a cell full or partially full of waste. Golder did not provide a leachate generation rate that would be expected on "day one" of operations.

Attachment 1 – Blue Mountains Landfill Leachate Generation, is a summary produced by Golder that outlines the leachate model, haulage records and precipitation norms and actuals. The attachment shows that norms, actuals and leachate hauled are all close in value of approximately 10,500 cubic metres. This further supports that leachate production is connected directly to precipitation and that the model provides an inaccurate value.

Future Years and Environmental Assessment

The outlook for 2017 is anticipated to improve as the operations will not be dealing with a portion of leachate from the previous year. Leachate generation in 2017 is anticipated to be 17,350 cubic metres, 10,350 cubic metres higher than the original design estimate of 7,000 cubic metres. This is 2.5 times higher than the design report but lower than what is expected in 2016.

Staff are continuing to review options to potentially reduce leachate generation and limit the financial burden to taxation. The priority will be to advance the Leachate Management Environmental Assessment (EA) planned for 2017. This EA will look at the option of on-site treatment and piping as potential alternatives. Both would have an up-front capital cost but will eliminate the haulage costs and replace it with a relatively low operational cost. The piped option will require the purchase of treatment plant capacity.

The 2016 Capital Budget Plan outlined an Environmental Assessment for managing landfill leachate in 2017. An initial estimate of cost was created in 2011 to install a force main to the existing Town sewer at the 7th Line. This estimated cost was $800,000 to $1,000,000 to complete the installation. Considering annual haulage costs the capital installation expense would have a simple payback (related to haulage only) of 7 years, not including treatment capacity.

West Cell Leachate

The Site is facing an additional leachate issue related to the spring freshet and developing cell conditions. The west cell of the Site will receive interim closure this year, as Town operations move into the new cell. Significant ponding water and leachate contaminated ponding water has accumulated in the west limit of the landfill in the first part of 2016. An estimated 7,800 cubic metres of water is currently sitting in the western end of the cell. This water must be removed before interim closure of the west cell can occur.

Staff have a plan to work with the landfill expansion construction contractor and implement drainage improvements to deal with the ponding water. Part of the solution will also involve pumping and hauling a portion (3,000 cubic metres) of the leachate using the existing haulage contractor.

Recommendations

Town Staff recommend increasing the 2016 operational leachate haulage and treatment budget from $106,750 to $402,070. This will cover the new estimate of leachate generation for 2016 in the new cell and west cell.

Town Staff also recommend increasing the contract amount with Region of Huronia Environmental Services under the recent tender (2015-45-T-EPW) from $54,950 to $220,070 for the 2016 year. This increase will cover the $135,000 associated with the new cell and the $23,550 associated with the west cell. These increases will also involve increasing the 2016 treatment costs from $45,500 to $182,000.

The 2017 Budget earmarked $35,000 for engineering fees related to an EA for a leachate piping project. Town Staff are recommending that this project be initiated in 2016 with funding coming from the Landfill Reserve.

C. The Blue Mountains' Strategic Plan

Expediting the leachate piping Environmental Assessment will ensure that our infrastructure is sustainable.

D. Environmental Impacts

Continuing to haul and treat the landfill's leachate is currently the only option to avoid leachate increasing to a level that would create operational challenges and compliance issues under the Site's Environmental Certificate of Approval.

E. Financial Impact

The table below outlines the estimated annual leachate management cost and compares that to a new estimate based on actual haulage in the first 3 months of 2016 and a review of average climatic data. A cost overrun of $295,320 is anticipated in 2016.

Item	Estimated (Budgeted)	Actual (based on first quarter)	Increase
Annual Leachate Generation - New Cell	7,000 m3	25,000 m3	18,000 m3
West Cell	-	3,000 m3	-
Haulage Cost (1)	$61,250	$220,070	$158,820
Treatment Charge (2)	$45,500	$182,000	$136,500
Total Cost	$106,750	$402,070	$295,320

(1) Haulage Rate (2016) $7.85/cubic metre
(2) Treatment Rate $6.50/cubic yard

At this time Staff are recommending that the overruns stay unfinanced until the 2015 year-end report is available; through that report Staff will look at the best funding source for this operating overrun.

Looking ahead to 2017 an estimated budget increase, based on an additional 10,350 cubic metres of leachate haulage and treatment, of $150,000 will represent a 1.5% increase over the 2016 taxation levy. During the budgeting process Staff will be looking at ways to reduce this impact to the tax rate.

F. In Consultation With

Sam Dinsmore, Manager of Budgeting and Accounts

G. Attached

1. The Blue Mountains Landfill Leachate Generation

Respectfully submitted,

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CSPW.16.069
Attachment # 1

The Blue Mountains Landfill Leachate Generation

Cell Substantial Completion date = 31-Aug-15
Cell 2D Surface Area = 17,493
Cell 3D Surface Area = 17,825

Vol. based on Climatic Norms and 100% collection = 17,351 m^3/year
Volume Pre-Closure (400 mm Avg. Water Balance) = 6,997 m^3/year ⇐ ***Percolation through Waste*** *- based on Average Annual Water Balance - Blue Mountains HELP Model*
Volume Post-Closure (240 mm Avg. Water Balance) = 4,198 m^3/year ⇐ ***Percolation through Cover*** *- based on Average Annual Water Balance - Blue Mountains HELP Model*

Month	Town Records		Climate Normals (1981-2010)		Actual (2015-2016)	
	Litres	Volume	Precipitation	Volume	Precipitation	Volume
	L	m^3	mm	m^3	mm	m^3
August-15	-	-	78.2	1,368	123.9	2,167
September-15	-	-	95.9	1,678	69.8	1,221
October-15	-	-	87.3	1,527	87.5	1,531
November-15	*101,920*	*102*	99.6	1,742	65.5	1,146
December-15	1,542,980	1,543	99.4	1,739	78.3	1,370
January-16	1,493,730	1,494	100.0	1,749	44.7	782
February-16	1,469,260	1,469	68.4	1,197	69.9	1,223
March-16	6,305,385	6,305	64.0	1,120	158.6	2,774
Total Removed by Town		**10,913** ⇐				

Volume September to March:	**10,751** ⇐	**10,046** ⇐
Volume October to March:	**9,074**	**8,825**
Volume November to March:	**7,546**	**7,295**
Volume December to March:	**5,804**	**6,149**
Volume January to March:	**4,065**	**4,779**