

STAFF REPORT: ENGINEERING AND PUBLIC WORKS DEPARTMENT

REPORT TO: Infrastructure and Recreation
 Committee
MEETING DATE: June 12, 2012
REPORT NO.: EPW.12.044
SUBJECT: 2011 Solid Waste Annual Report
PREPARED BY: Jeffery Fletcher, Manager of Solid
 Waste and Environmental Initiatives

A. Recommendations

THAT Council receive Staff Report EPW.12.044, entitled "2011 Solid Waste Annual Report" for their information.

B. Background

Under the Landfill Site certificate of approval (C of A) the Town is required to generate a report with regard to water monitoring and general Landfill Site operations. The Town satisfies this requirement with two separate annual reports: Solid Waste Report and Water Monitoring Report. The Town has retained Golder Associates to assist Town Staff in completing these reports.

The reports are required to be delivered to the Ministry of the Environment by April 15 of each year. The reports have been completed successfully and delivered on time since 2003 following the C of A amendment dated November 26, 2002. This Staff Report allows Town Council the opportunity to review the key report details, conclusions and recommendations.

Solid Waste Operational Report

A significant part of the operational report involves analyzing the previous year's tonnage data from the weight scale, curbside waste delivery and other various waste recycling programs. This data is best summarized in the table below which also shows two previous years for comparison purposes:

Item	Tonnage 2011	Tonnage 2010	Tonnage 2009
Residential (curbside and other)	2105	2011	2807
Construction/Demo	1703	1999	1969
Contaminated Soil	0	0	10853
Cover Material	46	233	3151
Total Landfilled	3854	4243	18780
Wood Waste (Cover)	65	67	69
Brush	330	484	691
Compostables	423	187	48
Leaves/Grass	181	216	193
Concrete/Asphalt	60	91	910
Curbside Recyclables	819	872	837
Depot Recyclables	51	61	na
Steel/Metal	112	130	159
Tires	7	8	4
Total Recyclables	2048	2116	2911
Total Managed	5902	6359	21691
Site Visits	11,724	10,198	na

In addition to the waste recycling outlined above the Town operated a household hazardous waste and electronic waste depot as approved collection locations under the Ontario industry stewardship programs. The Town diverted over 12 tonnes of hazardous material from the landfill, 98% of that material is reclaimed or reprocessed into new products. Additionally, half a tonne of propane tanks and 25 automotive batteries were recycled and 116 Freon containing units were serviced.

A wide variety of electronic waste was collected and recycled in 2011. A total of 19.4 tonnes of material was transferred off-site and processed through the Ontario Electronic Stewardship (OES).

Blue/Grey Box Recycling

The tonnage of blue/grey box material is down over the previous year but has increased over 2009, as seen in the table below.

Year	Total Tonnage Collected Blue and Grey Box, Curbside and Depot	Diversion Rate Blue and Grey Box
2009	837	30.8%
2010	933	34.0%
2011	870	32.1%

The diversion rate for the blue and grey box follows a similar trend over the past three years compared to the total tonnage collected. The peak diversion rate for the blue/grey box was in 2005 at 35.9%. Town staff has prepared an updated Waste Diversion Plan for the municipality that intends to address this slip in diversion rates and proposes methods of increasing the performance of the program.

With the new receiving area completed in 2010, bins for blue and grey box material were added. A total of 51 tonnes was collected at this depot area in 2011.

Annual Data Call

In addition to reporting to the MOE, Town staff completes an annual data call on municipal residential blue box diversion costs and residential waste tonnage. The verified results of this data information are used to distribute the funding associated with the industry supported blue box programs in Ontario. Town funding is based on a formula that weighs cost and tonnage to develop an efficiency rating which is also balanced with best practices and with other municipalities in the same group. The Waste Diversion Ontario (WDO) data call is very specific to costs related to residential blue box and the diversion rate generated and the tonnage information specific to residential diversion only. Subsequently the diversion rates and costs shown below are not a complete view of the total system but it is a very accurate look at costs associated with the residential blue box system and tonnages associated with all residential waste diversion, including blue box, hazardous waste, organics, metals, electronic waste and other recyclables.

WDO Data Call Summary

Year	Residential Blue Box Cost	Blue Box Recycling Rate (WDO Calculation)	Funding Received	Overall Residential Diversion Rate
2009	\$283,419	41.3 %	\$90,622	40.23 %
2010	\$282,840	68.1 %	\$111,722	41.97 %
2011	\$289,840	NA	NA	39.0 %

Under the data call program each municipality is placed into a group with similar municipalities, the Town is in Rural Collection South. This is the single largest group made up of 70 municipalities that have population ranges from 200 to 20,000. For comparison, the average overall diversion rate in this group in 2009 and 2010 was 29.72% and 29.5% respectively. The highest overall diversion in 2010 was the Municipality of Meaford at 57.58%.

Site Life

A significant discovery was made as a result of survey conducted in November of 2011; additional landfill life is expected over the previous year’s calculation. Previous surveys took the approach to measure only the volume of new waste deposited at the Site over the previous year and then subtract that amount from the total approved volume of the Site. With this method overtime the calculated remaining volume did not match the actual volume or capacity remaining. A different method of surveying and calculating was employed this year which involved measuring the volume consumed to understand the annual apparent density but also the capacity remaining or the void. It has been determined that as of November 2011 the Site has a remaining capacity of approximately 4 years. This is a considerable amount compared to the estimate in 2010 which conclude a remaining Site life of 1.4 years.

Although this does seem to give the Town some relief, development of new disposal capacity through the existing Environmental Screening Process should not be paused or delayed.

The table below outlines disposed mass (from scale data) the surveyed annual capacity consumption and calculated apparent waste density. Two previous years are included for comparison. Tonnage received at the Site is on a downward trend and is likely a result of slowed economic activity.

Year	Landfilled Tonnage	Capacity Consumption (m3)	Apparent Waste Density (kg/m3)
2009	4,722	12,800	373
2010	4,010	14,600	275
2011	3,808	11,200	340

Increasing compaction has been a priority over the last few years. Although the apparent density does not seem to reflect the additional effort going into compaction, covering and actual density of material has improved. The apparent density calculation is a combination of volume derived from a topographical survey and the mass of waste deposited as recorded by the weigh scale. Cover used and any soil materials delivered to the Site are not included in the apparent density calculation – therefore the volume that cover and soil material represents can change the apparent density calculation greatly. The more cover used and soil disposed of the lower the apparent waste density. In this regard two goals are working against each other: the requirement to cover waste material every operational day and the desire to maximize landfill space with optimized waste density. An industry best practise identifies an ideal obtainable compact rate of 750 to 900 kg/m3.

Training

The C of A mandates that Site staff obtain training related to landfill operations and the Town believes in the benefit of continuous learning opportunities. In 2011 the following waste related training was achieved by various members of staff:

- Ontario Blue Box Recycler Training – Fundamental Principles in Recycling Planning;
- Training and Orientation on HHW Depot, including WHMIS;
- Training in Trenching and Excavating;
- Certification as a Composting Systems Manager;
- General Spills Training.

Report Conclusions and Recommendations

A greater amount of compostable material was diverted from landfill in 2011, however curbside recycling has lowered slightly.

The remaining Site life is approximately 4 years and it is recommended by Golder Associates that placement and compaction operations be reviewed to increase the apparent waste density and site life and that part of this work should include an annual complete and full Site survey to confirm fill volumes and map out fill boundaries.

The Annual Report also references the impacts to the local groundwater, primarily to the east, these impacts are detailed in the next section of this staff report which reviews the 2011 Annual Water Monitoring Report.

Water Monitoring Report

The water monitoring report is more technical in nature than the operations report and it involves the sampling and analysis of ground water and surface water in an around the Landfill Site. There are presently a total of 34 individual monitoring wells, 24 wells are located on the Site and 10 are located on private or off-site locations.

During sampling in field parameters are taken and the samples are preserved for laboratory analysis. The samples are analyzed for major ions and other indicator parameters and two locations are sampled for volatile organic compounds and an extended list of heavy metals. The identified values are adjusted to estimated background groundwater quality and compared to the Reasonable Use Criteria (RUC) and Provincial Water Quality Objective (PWQO). RUC is a MOE guideline related to the management of groundwater quality that determines the level of contaminant discharge on to adjacent land that is considered acceptable. The PWQO parameters are used to evaluate the surface or stream water samples.

The annual monitoring also collects groundwater levels. Collecting water levels assists with understanding flow patterns. Town staff will begin a program of seasonal water level measurement beginning this year to add to the understanding of flow.

Two aquifers have been identified beneath and surrounding the Site, an Upper and Lower. In the last round of sampling the Upper Aquifer has been observed as dry with minimal flow. The Lower Aquifer has a flow that is generally northward and influenced by recharge from beneath the landfill. There is some eastern flow towards the Indian Brook as indicated in well 19, however at present flow to the brook is limited by underlying geology.

Report Conclusion and Recommendations

Impacted groundwater from the Thornbury Landfill is migrating eastward in the Upper Aquifer on to recently acquired lands that are off-site of the Landfill property. The migration is characterized by sulphate exceeding the RUC at BH19. Impacts, as defined by low to moderate concentrations of chloride, are observed in the Lower Aquifer at the northeast corner of the Site. With the recent purchase of eastern lands these location are no longer boundary compliance locations.

The RUC for nitrate is exceeded at locations to the south, east and north, however due to the low concentrations of other leachate indicators the nitrate impacts are considered to be related to agricultural practices.

Private wells associated with residences located to the north and west are located at least 500m from the licensed fill area and based on the observed extent of migration these wells will not likely be impacted in the near future.

Golder Associates has recommended a number of actions as a result of their study. These include more season water level sampling, sampling surface water for an extended number of metals, decommissioning and replacing three wells and adding a new well to the south, and installing data loggers on two northern wells to assist with defining flow regime.

Town staff have put a work program into place to complete most of the above recommendations this year. Completion of some items may be delayed until adequate budget allocation is identified and as time permits.

C. The Blue Mountains' Strategic Plan

This report works towards the Town's strategic goal of addressing municipal infrastructure needs and the development of a waste management strategy to meet diversion targets and address landfill capacity.

D. Environmental Impacts

None

E. Financial Impact

None

F. In Consultation With

None

G. Attached

None

Respectfully submitted,

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