

### **Project – General**

#### **1. What is the Re-engineering Project? Why is this Project necessary?**

The Barrie Landfill is being “re-engineered”, meaning that garbage in the landfill is excavated and screened. Following construction of an engineered liner and leachate collection system under each cell, the garbage is re-compacted along with incoming waste from City collection. The re-engineering project involves reclamation of waste from the western two-thirds of the surface area of the Landfill and construction of new lined cells. The re-engineering of the landfill site is required for the long-term protection of groundwater and surface water, in line with current engineering and environmental standards. The new lined cells are designed to collect leachate from the landfill which will be treated at the City wastewater plant. Controlling landfill leachate at the source is the most effective method of protecting water quality.

A landfill gas collection system installed in 2011 burns methane released from the garbage, which reduces greenhouse gas emissions as well as odours. Expansion of the gas collection system is ongoing as new landfill cells are constructed and filled. The re-engineering will also reduce the overall height of the landfill.

#### **2. When will the Re-engineering Project be completed?**

The Landfill Re-engineering Project was commenced and planned to be completed in three phases between 2008 and 2015. The first phase was completed in 2009 and involved the southernmost part of the landfill; the second phase was completed in February 2013 within the central area. The third phase of the Project in the northernmost landfill cells began in March 2013 and is expected to be completed by December 2015.

#### **3. What work has been completed to date?**

To date, five new cells have been constructed and about 1,400,000 cubic metres of garbage has been processed. Construction of the landfill gas flaring plant and upgrading of capping and stormwater controls in the area of Cell 1 were also undertaken. Ongoing activities during Phase 3 will include the excavation and screening of waste and the installation of liners and leachate collection systems in the northernmost cell, which will be used to landfill garbage after 2015. The remaining garbage (about 260,000 cubic metres) will be excavated and screened over the next year. Landfill gas collection system piping is extended as garbage is placed in the new cells.

#### **4. Can the Project be completed in the winter months?**

The entire Project cannot be completed in the winter months because the liners need to be installed during non-freezing conditions. In addition, the reclamation and cell construction must be scheduled to make sure there is enough capacity in the new cells to continue to manage incoming City garbage. Project operations and scheduling in 2013 and 2014 have been adjusted to stop garbage excavation and screening operations in the summer months, in order to minimize odour impacts on residents.

### **5. When is the Landfill now expected to reach capacity?**

Following completion of the project in 2015, the landfill is projected to have enough capacity for City garbage for another 18 years (until about 2035). The sustainable waste strategy undertaken by the City to manage City waste into the future will maximize landfill lifespan.

### **6. How does the landfill Gas Collection system work?**

The landfill gas collection system is a system of pipes and a flare designed to collect and burn landfill gases that are released as garbage decomposes. The flaring of the gas helps to reduce greenhouse gas emissions and odours. The system has been operational since 2011 and new collection pipes are installed as re-engineering progresses.

### **7. Will zoning (e.g., Environmental Protection) change?**

There are no plans to change the current zoning (e.g., Environmental Protection lands).

### **8. What is the liner made of? How much does it cost?**

New cells that are being constructed are lined with plastic (high density polyethylene) and manufactured clay liners that prevent contaminated water, or leachate, from entering into the groundwater below the landfill.

The cost of the liners varies depending on the amount and design, but is in the order of \$25 to \$30 per square metre installed.

### **9. What will happen to lands to the north of the landfill (e.g., borrow pit)?**

There are no plans to use the borrow pit lands to the north of the current face for landfilling.

### **10. I am concerned with dirt bikes along the north side of the landfill.**

The City of Barrie Police patrols the area and will respond to specific calls regarding dirt bikes and all-terrain vehicles.

## **Air Quality and Odour**

### **11. How is Landfill odour assessed and monitored?**

The City completed an Air Quality and Health Assessment in 2010 to analyze the air in the area of the landfill. The results of the study confirmed the compounds in gases from the landfill do not pose a health concern to the public. A follow-up study was initiated in the spring of 2014 and confirmed the concentration of compounds were equal to or less than those found in 2010. Additional air quality sampling will be completed in the fall of 2014.

During times when garbage is being excavated, the site and surrounding neighbourhood are monitored by City staff for early detection of off-site impacts such as odours. If required, on-site activities are modified to limit odours, including modification of excavation, deploying odour mitigation measures, or if necessary, stopping all activities to ensure the odours are properly controlled. Other activities including regular waste placement and composting are similarly managed to minimize odour generation.

### **12. What is being done to control odour?**

Measures used to reduce odours from the reclamation project include minimizing working areas to reduce exposed waste, placing cover material close to work areas so waste can be covered quickly when work is done, and use of odour suppressant misters and foam. The odour suppressants contain natural ingredients and are safe for humans and the environment. Daily work activities are planned based on weather and wind conditions to minimize odour effects on residents. In order to proactively control odours, garbage excavation and screening was stopped during the summer months of 2013 and 2014 when the potential for odours is the greatest and people may be at home more often.

Residents are encouraged to report any odours to City Staff (705-739-4220 ext. 4516).

### **13. What is the odour?**

The odours related to reclamation operations are largely caused by sulphur containing compounds in the gas generated during the decomposition of the garbage. This gas is released when the cover and garbage are excavated for processing. Odours are also caused by incoming garbage from City collection and by landfill gas releases in the completed areas of the landfill. Landfill gas is typically about 60% methane and 40% carbon dioxide with less than 1% other compounds (for example sulphur compounds, ethanol and ammonia).

### **14. What is being done about landfill gases?**

The landfill gas collection system collects gases that are released as garbage decomposes which are conveyed to the flare and burned, helping to reduce greenhouse gas emissions and odours.

### **15. Are there health effects from the odours?**

The presence of odour does not necessarily indicate the presence of hazardous compounds. The human nose can detect sulphur compounds, ethanol and ammonia at very low concentrations, well below the concentrations established by environmental and health regulations. The Air Quality and Human Health Assessment completed in 2010 and 2014 indicated there was no risk to human health from the air quality measured during reclamation operations, even though the compounds causing odour were present.

### **16. The odours seem strongest in the evening. Why haven't you done air quality sampling at night?**

The City will complete another round of air quality sampling this fall, including evening sampling, to respond to residents' concerns.

### **17. When will an updated air quality report be available?**

As indicated, the City is completing another round of air quality sampling this fall, including evening sampling, to respond to residents' concerns. An air quality report will be available after the air quality sampling is completed.

### **18. What is in the odour suppressant? Are there health hazards?**

The odour suppressant used is AirSoluton™ 9309 Odour Counteractant. This suppressant is a blend of essential oils and odorous organic compounds found in plants. The odour control products are considered safe for use on the basis that they have been applied according to manufacturer's recommendations and the key ingredients are approved for use in cosmetic and food products. The odour control products have been applied to the airflow in many waste, commercial, industrial and wastewater settings.

### **Stormwater Management**

#### **19. Where does the runoff from the landfill site go? Does it drain into Lake Simcoe?**

Stormwater runoff from the completed (final covered) areas of the landfill is directed to stormwater control ponds and largely infiltrates to the ground. All stormwater potentially in contact with waste is contained within the landfill cells and is discharged to the City Wastewater Treatment Facility. During larger storms, runoff from these areas is directed to Dyments Creek. The landfill is situated within the drainage watershed for Dyments Creek, which ultimately drains to Lake Simcoe.

#### **20. I am concerned about the intensity of run-off to Edgehill Drive. Will there be silt run-off from the site?**

The infiltration ponds and drainage channels are designed to promote infiltration of stormwater into the ground and prevent discharge off the site including and up to a 1 in 100-year storm event. In larger unusual events, any runoff will be directed in a controlled manner to the roadway and ultimately Dyments Creek. Silt runoff will be managed with silt fencing and other control measures in the interim period until the stormwater ponds are operational.

#### **21. What are the new stormwater management ponds?**

As the landfill is progressively completed and capped, the clean runoff is required to be controlled. Under normal conditions, all stormwater is managed on-site and there is no off-site discharge. Six new stormwater ponds and associated channels have been designed in the western part of the landfill as part of the reclamation project. This stormwater management system is designed to control runoff from major storm events that would otherwise result in discharge to Edgehill Drive and Dyments Creek.

#### **22. Why are stormwater management ponds being constructed?**

The Stormwater Management Plan has been prepared to manage surface water run-off from the landfill, which is a regulatory requirement by the Ontario Ministry of Environment and Climate Change. The stormwater management ponds will control surface runoff and promote infiltration of stormwater into the ground. These ponds are strategically located in close proximity to the landfill to manage runoff within the site. The stormwater management system has been designed to infiltrate storms as large as a 1 in 100 year event, as required by the current regulations. The system is also designed to manage larger flows in unusual storm events.

#### **23. Where will the stormwater ponds go?**

This stormwater management system is designed to control runoff from major storm events that would otherwise result in discharge to Edgehill Drive and Dyments Creek. The majority of infiltration ponds will

be located further north on site away from the residences on Edgehill Drive. A finishing pond will be located downstream where the clearing is located west of the north-south easement to Edgehill Drive. The final pond will have the capacity to control a major storm event that is not infiltrated in the upstream ponds.

### **24. How were these locations selected for the stormwater ponds?**

The pond locations were selected to effectively manage stormwater runoff as close to the landfill as possible and are sized to minimize tree loss and impacts to off-site groundwater levels. The locations of the ponds were designed based on the final contours of the landfill. The ponds are also designed to infiltrate as much water as possible local to the landfill. Under high stormwater flow conditions the surface water will progressively spill over into the lower ponds in the system, ending at Pond 6. In a very large storm, some surface water may temporarily discharge to Edgehill Drive.

### **25. Will the stormwater ponds be permanent?**

Yes. The Stormwater Management Plan was designed to accommodate surface water run-off from the final build out of the Landfill and promote infiltration of stormwater into the ground while the landfill is operational.

### **26. What type of approvals and level of consultation is required?**

An Environmental Compliance Approval (ECA) is required for stormwater management work. An amendment is required for the existing ECA. Public feedback is being sought on the Stormwater Management Plan including the restoration plan for areas surrounding the ponds. This feedback will be incorporated into the Plan and submitted to the Ministry of the Environment and Climate Change for approval.

Consultation with regulatory agencies is recommended under the Stormwater Management Planning and Design Manual (MOE, 2003) to determine existing areas of environmental significance. These agencies include the City of Barrie, Ministry of the Environment and Climate Change and the Lake Simcoe Region Conservation Authority.

### **27. Will I be able to see the ponds from my backyard? How big will they be?**

The infiltration ponds were designed to minimize tree loss and visual impact to residents. Trees and shrubs will be planted along the edges of the shallow ponds. The southernmost infiltration pond may be partly visible in some locations but it is relatively shallow and will appear as a grassy depression.

### **28. Will the stormwater ponds be fenced in?**

Trees and shrubs will be planted along the edges of the ponds to minimize tree loss and visual impact to neighbours and land users. Pond design includes the use of gentle slopes which eliminates the need for fences.

### **29. Will there be mosquitoes as a result of the stormwater ponds?**

The ponds will only contain water during and shortly after major storm events, and therefore the ponds will rarely contain standing water.

### **Natural Environment**

#### **30. Are rare species being investigated?**

A natural environment study was completed as part of the preparation of the Stormwater Management Plan. The studies are summarized in the Environmental Impact Statement report and confirmed no significant impacts resulting from the planned stormwater ponds. No occurrence of potential species at risk was recorded in the study area.

#### **31. Could fencing be moved for wildlife?**

The fencing of the site is a regulatory requirement, as well as a health and safety measure to control access to the active areas of the landfill. Following landfill closure, the areas requiring fencing will be re-assessed.

#### **32. How will forest be maintained?**

In 2014, City Council approved an Urban Forest Strategy for Barrie which outlines 26 specific objectives to be completed leading to the development of an Urban Forest Management Plan commencing in 2017. The Forest Management Plan will include individual forest succession plans for city owned forest in parks and EP areas. The forested areas around the landfill will be inventoried and a long term plan developed to ensure its sustainability.