

Groundwater Plume Delineation

Former Sabiston Landfill Site, Markham, Ontario

Liaison Committee Meeting - January 29, 2014



AGENDA

- **History – Council Resolution**
- **History - Communications**
- **Evaluation of Water Quality Impacts**
- **Applicable Regulatory Requirements**
- **Why Additional Monitoring Required**
- **Groundwater Well Installation**
- **Next Steps**
- **Questions / Discussion**

History – Council Resolution

- **June 26, 2012 - Council approved the following motion**
 - Resolution (6): “ That the following paragraph be referred to staff for a report to the General Committee in Fall, 2012 on an implementation plan and the impact of same on wildlife and vegetation:
 - That a Leachate Collection System be installed to intercept discharge to German Mills Creek and protect the Creek from contamination and where possible, this System should be installed and operated in a manner that minimizes disruption to existing wildlife and vegetation”
- **November 20, 2012 – Markham staff indicated the preferred alternative of leachate management is the establishment of a contamination attenuation zone (CAZ)**

History – Council Resolution (Cont'd)

- **Nov 20, 2012 - Council approved the following recommendation:**
 - Resolution (4): That the funding available in account 750-101-399-7028 “Settlers Park Landfill Site Management” of \$367,776 be re-allocated to fund the additional rehabilitation works identified in the report;
- **Rehabilitation works identified in the report:**
 - Backup generator and motor
 - Installation of additional groundwater monitoring wells (19 wells at 8 locations) to delineate the CAZ – **later reduced to 11 wells**
 - Groundwater plume delineation study
 - Monitoring works by Tervita Corporation
 - Installation of signage

History - Communications

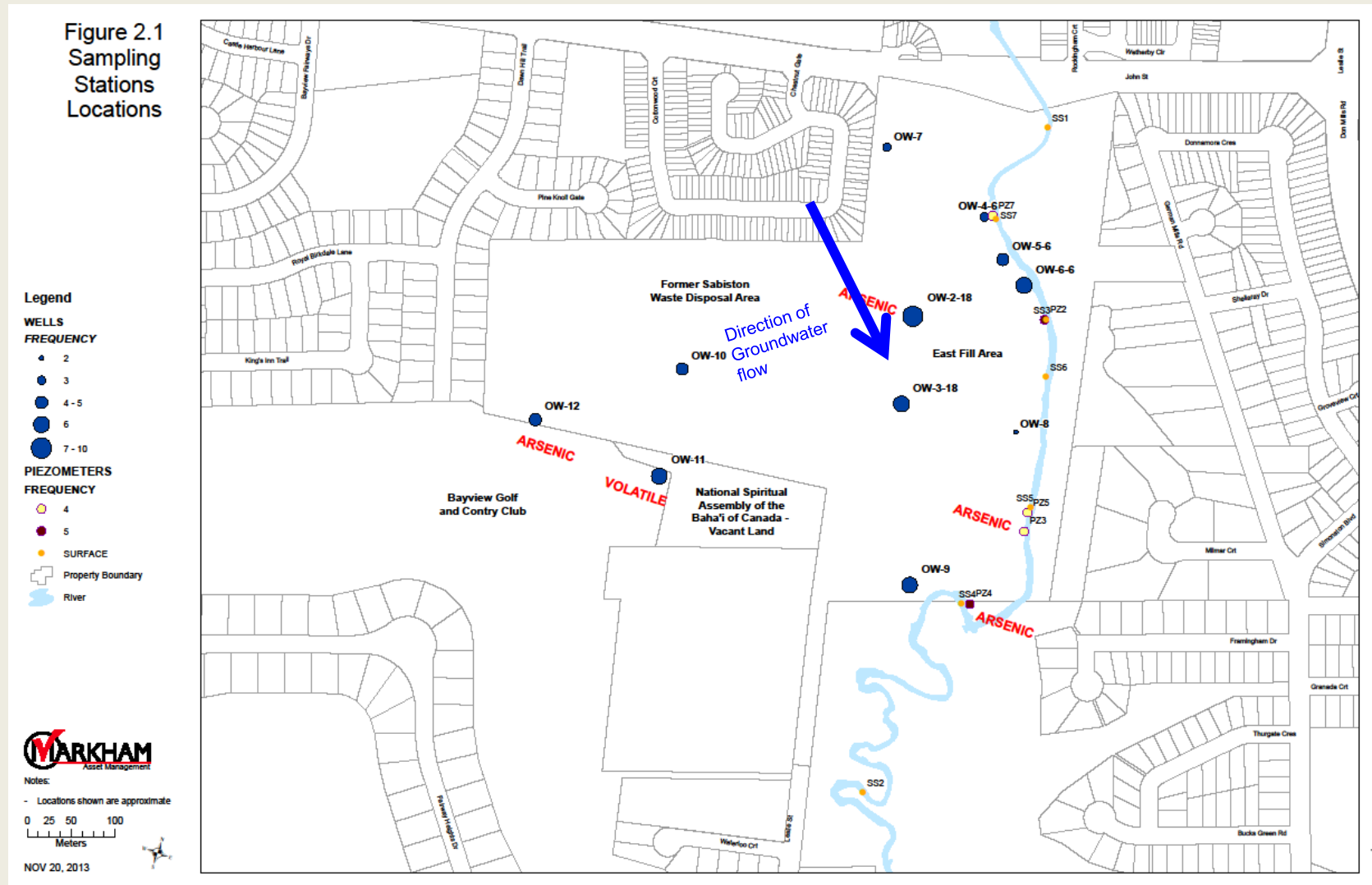
- **Meeting #2 (Sep 30, 2013)** – Liaison Committee requested additional information
- **Meeting #3 (Oct 9, 2013)** – Liaison Committee requested monitoring results
- **Memo #1 (Nov 6, 2013)** – Monitoring results
- **Memo #2 (Nov 15, 2013)** – Comparison of Down-gradient Well parameters with Background Well
- **Nov 21, 2013** – Staff met with Mr. James
- **Memo #3 (Dec 16, 2013)** – Answers to questions raised by Mr. James
- **Dec 17, 2013** – Staff met with Regional Councillor Li, Councillor Shore and Councillor Burke
- **Dec 18, 2013** – Councillor Shore met with Mr. James and Ms. Seymour
- **Memo #4 (Jan 15, 2014)** – Answers to additional questions raised by Mr. James and Councillor Shore

Evaluation of Water Quality Impacts

- **Water quality samples collected since 2009**
- **Compared water quality samples**
 - Background / up-gradient of the landfill (OW-7)
 - Within the landfill (OW-10)
 - Down-gradient of the landfill (OW-9, OW-11 and OW-12)
- **Results of monitoring program**
 - Landfill still producing leachate
 - Groundwater quality down-gradient of the landfill impacted by the landfill leachate
 - Higher concentrations of the leachate contaminants compared to background/up-gradient levels
 - The level of contaminants of concerns exceed the Ontario Drinking Water Quality Standard (ODWQS)
 - arsenic, vinyl chloride, tri-chloroethene (TCE) and di-chloroethene (DCE)] at monitoring wells OW-11 & OW-12
 - Unknown how far the groundwater impacts have migrated down-gradient of the site

Evaluation of Water Quality Impacts (Cont'd)

Figure shows direction of groundwater flow, monitor stations with the greatest number of parameters at concentrations exceeding the ODWQS or PWQOs, and key health-related contaminants of concern.



Applicable Regulatory Requirements

- **The water quality monitoring program at the Sabiston Landfill Site and any required remedial measures must be in compliance with the following regulatory requirements:**
 - Ontario Water Resources Act (OWRA) and Safe Drinking Water Act (SDWA)
 - Ontario Drinking Water Quality Standards (ODWQS)
 - Provincial Water Quality Objectives (PWQOs)
 - Ontario Environmental Protection Act (OEPA)
 - O. Reg. 153/04 – Soil, Groundwater and Sediment Site Condition Standards (SCS)
 - O. Reg. 232/98 – Landfill Standards Guideline
 - Reasonable Use Concept (RUC) Policy – Ministry of the Environment
 - Canadian Fisheries Act

Why Additional Monitoring Required

- **Determination full extent of leachate impacts**
- **Assess if mitigation measures are required**
- **Typical process in brownfield site investigation – continues until the boundaries of the contamination plume are identified**
- **Gaps in existing monitoring: depth and location (down-gradient)**
- **Risk to down-gradient receivers**
- **Continue to meet applicable regulatory requirements**

Groundwater Well Installation

- **Installation of 11 new monitoring wells at 8 locations**
 - Assess groundwater conditions down-gradient and in the deeper aquifer
- **Sensitive to protection of the natural habitat:**
 - Proposed in grassed areas (no trees or shrubs clearing)
 - Installation to take place outside of ground bird nesting for period of approx. 2-3 weeks
 - Work will be completed in accordance with requirements of the Toronto and Region Conservation Authority (TRCA) and Ministry of Natural Resources (MNR)
 - Installation of wells will have no insignificant impact on the surrounding natural environment
- **Installation work will be monitored by AMEC & Biologist from Dillon Consulting in accordance with the established Environmental Monitoring Management Plan (EMMP)**
- **Deadline to complete installation is April 1st 2014 per MNR permit**

Groundwater Well Installation (Cont'd)

(Location Map)



Groundwater Well Installations (Cont'd)



Next Steps

- **February 3, 2014** – Status update to General Committee
- **Communication to public**
- **Complete additional well installations prior to Permit expiry**
- April 1, 2014
- **Report results of additional monitoring after one-year installation to Council and Liaison Committee**

Background

Typical Schematic of Water Quality Impacts at Landfill Sites

