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Estates of Glenway Newmarket (Marianneville Developments Limited)

L09-301

Report

Consulting Engineering Services

Phase II Environmental Site Assessment (ESA) for 470 Crossland Gate, Marianneville Developments Limited, Town of Newmarket, Ontario

April 2012

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April 11, 2012
Our Ref: L09-301

Ms. Joanne Barnett
Marianneville Developments Limited
c/o The Kerbel Group Inc.
26 Lesmill Road, Unit 3
Toronto, ON M3B 2T5

Dear Ms. Barnett:

Re: Phase II Environmental Site Assessment (ESA)
470 Crossland Gate, Town of Newmarket, Ontario

Cole Engineering Group Ltd. has completed the Phase II Environmental Site Assessment (ESA) at the above mentioned property. A summary of the work undertaken and the soil and groundwater sampling results are documented in the accompanying report.

We thank you for the opportunity to undertake this work on your behalf. If you have any questions, please do not hesitate to call our office.

Yours truly,

COLE ENGINEERING GROUP LTD.

Tabitha Lee, M.A.Sc., P.Eng.
Business Unit Leader

Andre Lyn, B.E.S., P.Geo. (Ltd.)
Project Manager

/ao

Executive Summary

Cole Engineering Group Ltd. (CEG) was retained by Ms. Joanna Barnett of The Kerbel Group Inc. (on behalf of Marianneville Development Limited) to conduct a Phase II Environmental Site Assessment (ESA) for the property at 470 Crossland Gate, Newmarket, Ontario (herein referred to as the Site). The purpose of the Phase II ESA was to investigate potential soil impacts as a result of historical and current land use on-site for due diligence purposes. The future land use of the Site is proposed to be residential and a Record of Site Condition (RSC) will be required.

The purpose of the study was to investigate the potential for the presence of on-site contamination related to on-site concerns stemming from pesticide use and off-site concerns related to fuel storage.

One (1) borehole was drilled on the Site and a total of two (2) soil samples (plus one (1) trip blank) were submitted for laboratory analysis. A total of four (4) surficial soil samples (including one (1) duplicate) were submitted for laboratory analysis. The soil samples analyzed were compared to the applicable *Soil and Groundwater Standards – Table 2 Potable Groundwater - as amended April 15, 2011* for Residential/Parkland/Institutional Property Use for Coarse-grained materials. A total of three (3) groundwater samples (plus two (2) trip blanks and a duplicate sample) were also submitted for laboratory analysis. Groundwater samples were compared to the applicable *Soil and Groundwater Standards – Table 2 Potable Groundwater - as amended April 15, 2011* for All Types of Property Use for Coarse-grained materials. Groundwater samples were collected from existing monitoring wells on-site that were installed as part of the Hydrogeological Investigation, also being conducted by CEG.

All soil and groundwater samples were submitted to Maxxam Analytics in Mississauga, Ontario for analysis.

The results of the soil analyses for OC Pesticides, VOCs and Petroleum Hydrocarbon fractions F1-F4 indicated that all samples submitted for analysis met the applicable Table 2 SCS.

The results of the groundwater analyses indicated that all samples submitted for analysis met the applicable Table 2 SCS.

Based on the findings of our soil and groundwater sampling program, contamination was not identified on the property. No further investigation is recommended.

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1.0 Introduction

Cole Engineering Group Ltd. (CEG) was retained by Ms. Joanne Barnett of The Kerbel Group (on behalf of Marianneville Development Ltd.) to conduct a Phase II Environmental Site Assessment (ESA) for the Marianneville Development Ltd. property located at 470 Crossland Gate, Newmarket, Ontario. For the purposes of this report, the "Property" is defined as the area bounded to the north by Davis Drive, to the west by Bathurst Street and property boundaries for 470 Crossland Gate, Highway 11 North and to the east and south by the property boundaries for 470 Crossland Gate. The "Site" includes all portions of the Property to the east of the hydro corridor and the park area south of the pumping reservoir, the lands east of Kirby Crescent and the north portion of the Site bordering Alex Doner Drive on the west side of the hydro corridor (**Figure 1**). The purpose of the Phase II ESA was to investigate potential soil impacts as a result of historical and current land use on-site for due diligence purposes. The future land use of the Site is proposed to be residential and a Record of Site Condition (RSC) will be required.

The purpose of the study was to investigate the potential for the presence of on-site contamination related to on-site concerns stemming from pesticide use and off-site concerns related to fuel storage.

1.1 Site Description

The Site is comprised of seven (7) PIN numbers. The PIN numbers which make up the Site and their associated legal descriptions are described below:

PIN 03584-003 LT

Parcel 73-1 Section 65M-2284, being Block 73 Plan 65 M-2284; together with easement over Part Lot 94 Concession 1 West of Yonge Street, designated as Part 1 Plan 65R-5721 as in LT109148; Newmarket.

PIN 03580-0293 LT

Parcel 155-1 Section 65M-2205, being Block 155 Plan 65M-2205; together with easement over Part Lot 94 Concession 1 West of Yonge Street, designated as Part 1 Plan 65R-5721 as in LT109148; together with easement over Parts 1 & 2 Plan 65R-6519 for the purposes of ingress and egress to the said lands by pedestrians, golf carts and service vehicles, the exact terms and conditions of which may be the subject of further agreement with The Corporation of the Town of Newmarket, as set out on Plan 65M-2211 (subject to LT156090); subject to an easement over Parts 5, 6, 7, 8 & 9, Plan 65R-7111, Parts 5 &6, Plan 65R-7112, Parts 13, 14 & 15, Plan 65R7114 and Parts 3 & 4, Plan 65R7113, as in LT195504; subject to an easement in LT317245, Newmarket (Amended 2001/02/05 at 10:06 by Lois Yakiwchuk, ADLR); subject to easement over Part 1 Plan 65R-23447, as in LT1596157.

PIN 03581-0209 LT

Parcel 92-3 Section 65M-2212, being Part of Block 92 Plan 65M-2212 designated as Parts 1, 4, 5, 6, 7 Plan 65R-7939; together with an easement in favour of the owners of Block 92, Plan 65M-2212 over those parts of Streets on Plan 65M-2212 designated as Part 1, Plan 65R-6520 for the purposes of ingress and egress to the said lands by pedestrians, golf carts and service vehicles, the exact terms and conditions of which may be the subject of further agreement_with The Corporation of the Town of Newmarket, as set out on Plan 65M-2212; together with easement over Part Lot 94, Concession 1 designated as Part 1 Plan 65R-5721 as in LT109148; subject to LT195504, LT583898 Newmarket.

PIN 03581-0179 LT

Parcel144-1 Section 65M-2261, being Block 144 Plan 65M-2261; together with easement over Part of Lot 94 Concession 1 designated as Part 1 Plan 65R-5721 as in LT109148; LT474734 Newmarket.

PIN 03581-0178 LT

Parcel 142-1 Section 65M-2261, being Block 142 Plan 65M-2261; together with easement over Part of Lot 94 Concession 1 designated as Part 1 Plan 65R-5721 as in LT109148; Newmarket.

PIN 03581-0027 LT

Parcel 89-1 Section 65M-2263, being Block 89 Plan 65M-2263; together with easement over Part of Lot 94 Concession 1 designated as Part 1 Plan 65R-5721 as in LT109148; LT474734 Newmarket; subject to easement over Part 6, Plan 65R-22514, as in LT1570875; subject to easement over Parts 5 & 7, Plan 65R-22514, as in LT1570878*

[* only a portion of this PIN (as illustrated in Figure 1) was included in this investigation]

PIN 03582-0505 LT

Parcel 91-1 Section 65M-2212, being Block 91 Plan 65M-2212; together with easement over Part of Lot 94, Concession 1, designated as Part 1 Plan 65R-5721 as in LT109148; Newmarket.

The Site is irregular in shape and is approximately 36.3 hectares in area with approximately 5000 m^2 of which is covered with building structures and include the following:

- Clubhouse
- Tennis dome
- Golf cart storage building
- Pump house

The Site is accessible from the northern portion of the Site off Alex Doner Drive or Crossland Gate. The building structures are predominantly situated in the central-northern quadrant of the Site. A system of four ponds is located on the Site that is connected to the other ponds on the Property via a piping system. A hydro corridor runs through the middle of the Property in a northwest to southeast direction.

The land use surrounding the Site is predominantly residential. To the west of the hydro corridor is the remainder of the Glenway Estates golf course and a pumping reservoir. The Upper Canada Mall lies northeast of the Site and adjacent to the site to the east is a GO bus station, followed by a commercial plaza. Residential units lie south of the Site, followed by the Ray Twinney Recreation Complex and Crossland Public School.

A Site Location Map is attached as **Figure 1**.

1.2 Property Ownership

The Site is currently owned and operated by:

Marianneville Developments Limited
26 Lesmill Road, Unit 3
Toronto, ON
M3B 2T5

1.3 Current and Proposed Future Uses

The Site is currently zoned for parkland use. The proposed future land use is residential. An RSC will be required to satisfy land development approvals.

1.4 Applicable Site Condition Standard

The subject property is currently zoned for parkland use. The well record search from the Phase I ESA identified 13 domestic groundwater wells, 2 commercial/industrial wells, 1 irrigation/livestock well and 5 public/municipal wells within 1 km of the Site. Groundwater is considered a potable water source. Based on the Phase I ESA, it was determined that the surficial soils in the vicinity of the Site consist of glaciolacustrine deposits composed of silt and clay that is massive to laminated or rhythmically bedded basin deposits and Newmarket Till, which is composed of massive, silty sand to sandy silt matrix, with moderate to high matrix carbonate and clast content. In order to take a conservative approach, the coarse-grained standard will be applied. The following environmental site condition standards (SCS) and criteria were used:

> MOE. *O. Reg. 153/04, Soil, Groundwater and Sediment Standards for Use Under Part XV.1 Of the Environmental Protection Act*, Published March 9, 2004, as amended April 15, 2011 – Criteria: Table 2 – Potable Ground Water – Residential/Parkland/Institutional Property Use for Coarse-Grained Materials.

The property is not considered to be environmentally sensitive since there are no areas of natural or scientific interest on or immediately adjacent to the Site according to mapping obtained from the Ministry of Natural Resources.

The use of generic standards is deemed appropriate since the pH values are within acceptable ranges for surface and subsurface soils, the depth to bedrock is greater than 2.0 metres and there are surface water bodies on-site which are not considered “permanent” since they are man-made and used for drainage purposes.

The scope of work was carried out in accordance with accepted industry standards defined for both provincial and federal jurisdictions. The following lists the guidance documents and standards that have been adhered to as part of this assignment:

> CSA. *Z769-00 Phase II Environmental Site Assessment*. March 2000.
>
> MOE. Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario. December 1996.

2.0 Background Information

2.1 Physical Setting

Data and information obtained and reviewed through the Phase I ESA conducted by CEG regarding the physical setting of the Site is summarized below:

2.1.1 Topography

An Ontario Base Map containing topographic data of the area around the Site suggests a generally flat terrain with a mound on the western side of the Site. As the area is currently a golf course, the Site has been landscaped to appear generally rolling with some flat areas. Locally, the topography slopes toward

the SWM ponds on site. Generally, there is a downward northwesterly slope toward Ansnorveldt Creek, and southeasterly slope toward Western Creek. On a regional scale, the land slopes north towards Lake Simcoe.

2.1.2 Physiography

A physiographic map of the area indicates that the Site is located within the Simcoe Lowlands Physiographic Region which is generally composed of sand, silt, and clay. According to Chapman and Putnam, 1984, the area consists of level plains based on deep deposits of sand and silt. To the east of the Simcoe Lowlands Physiographic Region is the Schomberg Clay Plains Physiographic Region, and to the west is the north slope of the Oak Ridges Moraine Physiographic Region.

2.1.3 Bedrock Geology

The bedrock geology of the north portion of the Site comprises the Ottawa Group, Simcoe Group, and Shadow Lake Formation. This was formed in the Middle Ordovician period, and is composed primarily of limestone, dolostone, shale, arkose, and sandstone. The bedrock geology of the south portion of the Site comprises the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member, and Eastview Member. This was formed in the Upper Ordovician period, and is composed primarily of shale, limestone, dolostone, and siltstone.

The subsurface information obtained from EcoLog ERIS's Water Well Information System search and the MOE Well Records search was used to estimate that the bedrock at the Site is located at approximately 100 meters below ground surface.

2.1.4 Surficial Geology

The surficial geology of the Site was deposited in the Pleistocene age. It consists of glaciolacustrine deposits composed of silt and clay that is massive to laminated or rhythmically bedded basin deposits, and Newmarket Till, which is composed of massive, silty sand to sandy silt matrix, with moderate to high matrix carbonate and clast content.

Surficial geology information obtained from EcoLog ERIS's Water Well Information System search and the MOE Well Records search indicated that the surficial geology in the vicinity of the Site consist mostly of clays with some silt, sand, and gravel at deeper depths.

2.1.5 Groundwater Flow Direction

Regional groundwater flow in the area typically flows in a northerly direction towards Lake Simcoe. Local shallow groundwater likely reflects the topography and flows in a southward direction toward Western Creek, or north-westward direction toward Ansnorveldt Creek.

2.1.6 Water Bodies and Areas of Natural Significance

The Site is located predominantly within the East Holland River Subwatershed with the west portion of the Site within the West Holland River Subwatershed, under the jurisdiction of the Lake Simcoe Region Conservation Authority. There are no creeks on the Site, but immediately north of the Site is Ansnorveldt Creek, and west of the Site is Western Creek. Ansnorveldt Creek flows into the West Holland River and Western Creek flows into the East Holland River. A Natural Features Map is presented as **Figure 2**.

The National Heritage Information Centre (NHIC) was queried for areas of natural significance for a 1 kilometre radius around the Site. The search results revealed no areas of natural significance within 1 kilometre of the Site.

2.2 Past Investigations

As part of the current undertaking CEG conducted a Phase I ESA for the Site. Table 2.1 identifies the potentially contaminating activities determined through the Phase I ESA investigation:

Table 2.1 Potentially Contaminating Activities

Site	Potentially Contaminating Activity
Site (470 Crossland Gate)	Pesticides (including herbicides, fungicides and anti-fouling agents) manufacturing, processing, bulk storage and large-scale applications
Off-Site (306 Crossland Gate)	Pesticides (including herbicides, fungicides and anti-fouling agents) manufacturing, processing, bulk storage and large-scale applications
Off-Site (neighbouring parcel to the south – approximately 100 m south)	Gasoline and associated products storage in fixed tanks Pesticides (including herbicides, fungicides and anti-fouling agents) manufacturing, processing, bulk storage and large-scale applications

Based on the Phase I ESA, potential environmental concerns are present on the Site relating to pesticide use. Off-site concerns include pesticide use and gasoline and associated products storage.

The following Areas of Potential Environmental Concern (APEC) were identified for the subject Site and are summarized in Table 2.2:

Table 2.2 Areas of Potential Environmental Concern

APEC #	Contaminants of Concern	Location	Rationale
APEC-1	Pesticides	Entire Site	Application of pesticides on the Site as well as potential spills from the off-site pesticides operator may have resulted in soil and groundwater contamination due to migration of the chemicals.
APEC-2	Pesticides Petroleum Hydrocarbons (PHCs) (BTEX, F1-F4)	Neighbouring Parcel South of Site	Storage of pesticides and fuel tanks may have historically had spills which may have resulted in soil and groundwater contamination on the Site due to migration of chemicals.

The list of APECs identified is based on our observations of current site conditions and understanding of historical uses though various searches.

3.0 Scope of the Investigation

3.1 Overview of Site Investigation

CEG's scope of work for this ESA consists of the following general tasks:

- A **Background Review** of previous environmental work that has been conducted on the property to assist in identifying potential areas of environmental concern where possible contamination may exist;
- **Development of a Work Plan** that focuses on the investigation of potential areas of environmental concern identified in previous work;
- An **Intrusive Investigation Program** that includes environmental sampling in areas previously identified as having the greatest likelihood for contamination;
- An **Analytical Program** that targets contaminants of concern, incorporates analyses from a Canadian Association for Laboratory Accreditation (CALA) Accredited Laboratory and compares analytical results to the applicable provincial regulatory criteria;
- Incorporating field, laboratory and overall project **Quality Assurance and Quality Control** policies and procedures; and
- **Reporting** which summarizes the overall findings of the ESA and provides conclusions and recommendations for future work including an estimate for additional costs, should contamination be identified.

3.2 Media Investigated

Based on the results of the Phase I ESA conducted by CEG, it was determined that surficial and subsurface soil and groundwater samples would be collected and analyzed for various parameters and at various depths in areas of potential environmental concern as outlined in the Phase I ESA conducted by CEG.

3.3 Phase One Conceptual Site Model

The stratigraphy underlying the subject Site generally includes fine grained materials characteristic of the Newmarket Till, however, is interspersed with sand deposits. The topography undulates on a site scale and tends to slopes towards the northeast on a more regional scale. The groundwater likely flows in a northerly direction towards Lake Simcoe, and may be influenced by the capture zones of the municipal wells located to the east and northeast of the Site.

Potential contaminants may be introduced to the Site via current and historical activities on the subject Site and from neighbouring properties. Pesticide use and waste generation may have contributed to soil and groundwater impacts on the facility. Potential sources of PCBs, ODSs, and lead in the buildings will need to be addressed prior to demolition. Potential off-site environmental concerns include pesticide use and storage, and fuel storage and dispensing.

There is the potential that spills may have occurred as a result of the use and mixing of pesticides and/or herbicides on-site as well as off-site. Although the half-life of most pesticides and herbicides is quite short when sprayed, the potential exists for larger spills to have occurred and not been reported resulting in soil contamination. Pesticides/herbicides storage occurs on the neighbouring property, approximately 100 m south of the Site, and a landscaping company with a licensed pesticide operator is located in the residential area in the middle of the Site. If spills occurred, it is possible that the chemicals would be introduced to the soil and groundwater system. The use of more persistent chemicals for the spraying of the greens would likely be present in shallow soils in the area of application, provided that the soil materials were not reworked extensively or moved.

Fuel storage tanks that are active and were used historically off-site may have leaked or spilled and resulted in soil contamination. PHCs could travel downwards through the subsurface materials until intercepted by the water table. The water level in this area is known to be shallow. PHCs would likely flow in the direction of groundwater flow in a north, northeasterly direction if introduced and be limited to the zone of water table fluctuation.

The variety of potential contaminants of concern include: PHCs (BTEX, F1-F4), VOCs, and pesticides. It is possible for these contaminants to travel downwards until intercepted by the water table. Preferential pathways introduced by road bedding and underground utilities could act to transmit potential concerns.

3.4 Deviations from Sampling and Analysis Plan

Deviations from the sampling and analysis plan can be encountered as a result of unexpected field and/or weather conditions as well as from equipment limitations.

No deviations from the sampling and analysis plan were encountered.

3.5 Impediments

Physical impediments may be encountered during the intrusive investigation which may impede the collection of samples at desired depths, hinder access to specific locations on the Site, or any other item which may prevent the completion of all aspects of the sampling and analysis plan.

No physical impediments were encountered during the investigation.

4.0 Investigation Method

4.1 General

The findings from the review of previous environmental work identified areas of potential environmental concern associated with pesticide use at the Site. Off-site concerns include pesticide use and gasoline and associated products storage. A work plan was developed taking these locations and the anticipated Site groundwater flow direction into consideration.

4.2 Investigation Program

Sonic Soils conducted the borehole drilling program on March 14, 2012 under the supervision of Andre Lyn, B.E.S., P.Geo. (Ltd.) and management of Qualified Person Ms. Tabitha Lee, M.A.Sc., P.Eng.

The investigation program included the drilling of one (1) borehole and the collection of surficial and subsurface soil samples in areas deemed most likely to have been affected by potentially contaminating activities. Groundwater samples were also collected from existing monitoring wells installed on-site during the Hydrogeological Investigation being conducted concurrently by CEG.

Prior to commencing sampling activities, utility and service providers were contacted to identify and mark the locations of underground installations in the study area. The utility companies that were contacted included gas and telephone, local hydro, cable services, as well as the municipal Public Works Department for water and wastewater (sewers) servicing. Utility locates information is provided in **Appendix A**. A Site Plan, with all sampling locations is included as **Figure 3**.

Sonic Soils drilled one (1) borehole on the Site. A total of two (2) subsurface soil samples (plus one (1) trip blank) were submitted for laboratory analysis. A total of four (4) surficial soil samples (including one (1) duplicate) were collected in locations selected to be most likely to contain contaminated materials. A total of three (3) groundwater samples (plus one (1) duplicate and two (2) trip blanks) were collected from three (3) existing monitoring wells selected based on proximity to areas of potential environmental concern.

Borehole logs for the borehole drilled on-site as well as the three (3) monitoring wells utilized as part of this investigation indicating encountered soil types, colour, presence of deleterious materials and any visual or olfactory evidence of environmental contamination are included as **Appendix B**. Table 4.1 describes the APEC investigated, samples, and analyses performed.

Table 4.1 Sample Description and Analysis Performed

APEC Investigated	Media	Sample ID	Depth (mbg)	Analysis Performed
APEC-1	Soil	SS-1	0.15-0.30	OC Pesticides
		SS-2	0.15-0.30	
		SS-3	0.15-0.30	
		Dup-1 (duplicate of SS-2)	0.15-0.30	
APEC-2		BH1-4	0.91-1.37	Petroleum Hydrocarbon Fractions F1-F4, VOCs
		BH1-7	2.13-2.64	
-		Trip Blank (soil)	-	VOCs
APEC-1	Groundwater	MW11-S	-	OC Pesticides
APEC-2		MW1-D	-	Petroleum Hydrocarbon Fractions F1-F4, VOCs
		MW1-S	-	
		Dup (duplicate of MW1-S)	-	
-		2 x Trip Blank (water)	-	VOCs

4.3 Soil Investigation

Soil samples were collected in accordance with accepted industry standards. Sampling, transportation and storage procedures were conducted according to the *MOE Guidance on Sampling and Analytical Methods for use at Contaminated Sites in Ontario* and O. Reg. 153/04 as amended April 2011.

A gasoline powered Pionjar with attached split-spoon samplers was used to obtain subsurface soils samples. Surficial soil samples were collected using a trowel. The top layer of earth was removed and soil samples were collected from approximately 0.15 to 0.30 mbg. The trowel was washed with an Alconox solution and rinsed prior to the collection of each sample. A new pair of Nitrile gloves was worn for each sample. Soil samples were collected in individually labelled Ziploc™ bags prior to being placed in laboratory-supplied sample containers. The samples were then placed in pre-labelled laboratory-supplied sample containers and stored within individual bubble wrap bags in an ice-packed cooler to maintain a temperature of approximately 4°C.

4.3.1 Soil Sampling Program

BH1

Borehole BH1 was drilled at the southern portion of the Site in the vicinity of MW1-S and MW1-D (**Figure 3**). The borehole was drilled to a depth of 3.05 mbg. The soil samples collected via split spoon at BH1 indicated a layer of moist, dark brown clayey silt to a depth of 0.30 mbg followed by a medium brown, slightly moist silty clay with bits of yellow (likely from oxidization) to 1.68 mbg, a dark brown clayey silt with trace organics to 1.83 mbg, a slightly moist, dark brown silty clay to 2.13 mbg, a medium grey, wet silty clay with trace organics to 2.64 mbg and a brown silty clay to the borehole completion depth. No hydrocarbon odours were reported. The contaminants of concern for this location were PHC fractions F1 to F4 and VOCs. Two (2) soil samples were submitted to the laboratory for analysis.

SS-1, SS-2 & SS-3

Surface soil samples SS-1, SS-2 and SS-3 were collected using a trowel from three locations on-site: in the north-central portion of the Site, to the west of the hydro corridor near the southwest portion of the Site and at the east-central portion of the Site (**Figure 3**). Samples were collected from approximately 0.15 to 0.30 mbg. The contaminants of concern for this location were OC Pesticides. Four (4) soil samples (including one (1) duplicate) were submitted to the laboratory for analysis.

4.3.2 Field Screening Measurements

Soil samples were collected in duplicate for the purposes of screening and selection for laboratory analysis. One set of the duplicate soil samples were placed directly into pre-cleaned, laboratory-supplied glass sample jars/vials for chemical analyses. The other set of soil samples were placed in sealed Ziploc™ plastic bags for vapour screening.

Samples in plastic bags were allowed to reach ambient temperature (approximately 20°C) prior to field screening with a calibrated RKI Eagle combustible gas instrument (CGI) with methane elimination. The CGI was calibrated in fresh air in the field and the measurements were made by inserting the instrument's probe into the plastic bag while manipulating the sample to ensure volatilization of the soil gases. These readings provide a real-time indication of the relative concentration of organic vapours encountered during the drilling and are used to guide the selection of soil samples submitted for laboratory analysis if required.

The RKI is able to detect the following:

- Combustible gas (response to methane may be eliminated using switch)
- 0-100% lower explosive limit (LEL)
- 0-50,000 parts per million (ppm)

The accuracy of the RKI is listed at ± 5% of reading or ± 2% LEL (whichever is greater).

A summary of soil analysis results can be found in **Tables C-1** and **C-2** in **Appendix C**. The Certificates of Analysis are appended as **Appendix D.**

4.4 Groundwater Investigation

4.4.1 Monitoring Wells Utilized

Three (3) existing on-site monitoring wells were utilized to collect groundwater samples based on proximity to areas of potential environmental concern. MW1-D and MW1-S are located at the southern

portion of the hydro corridor that runs in a northwest to southeast direction while MW11-S is located near the northeastern portion of the Site.

Prior to sampling, the monitoring wells were developed and purged using dedicated Waterra tubing with a foot valve to allow for the influx of the surrounding groundwater.

Table 4.2 summarizes the monitoring well installation details.

Table 4.2 Monitoring Well Installation Details

Monitoring Well ID	Diameter (m)	Material of Construction	Screen Length (m)	Depth (mbtp)	Depth to Water (mbtp) March 14, 2012	RKI Readings (ppm)
MW1-D	0.05	PVC	1.5	11.8	2.75	25
MW1-S	0.05	PVC	3.05	7.04	2.43	-
MW11-S	0.05	PVC	3.05	7.02	3.82	-

4.4.2 Groundwater Sampling Program

Groundwater samples were collected in accordance with accepted industry standards. Sampling, transportation and storage procedures were conducted according to the *CCME Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites* and the *MOE Guidance on Sampling and Analytical Methods for use at Contaminated Sites in Ontario*.

Groundwater samples were collected using dedicated low density polyethylene Waterra tubing fitted with a foot valve. A new pair of Nitrile gloves was worn for each sample. The samples were placed in pre-labelled laboratory-supplied sample containers and glass vials and stored within individual bubble wrap bags in an ice-packed cooler to maintain a temperature of approximately 4°C. The samples were transported and submitted to the analytical laboratory under Chain of Custody documentation.

Zero head space was maintained for VOCs groundwater samples.

One (1) sample was collected from MW11-S on February 9, 2012 and submitted to the laboratory to be analyzed for OC Pesticides. One (1) sample was collected from MW1-D on February 17, 2012 and submitted to the laboratory to be analyzed for Petroleum Hydrocarbon Fractions F1-F4, BTEX and VOCs. One (1) sample was collected from MW1-S on March 14, 2012 and submitted to the laboratory to be analyzed for Petroleum Hydrocarbon Fractions F1-F4, BTEX and VOCs.

A summary of groundwater analysis results can be found in **Tables C-3-C5** in **Appendix C**. The Certificates of Analysis are appended as **Appendix D.**

4.5 Analytical Testing

All analytical testing during this investigation was carried out by Maxxam Analytics in Mississauga, Ontario. Maxxam is accredited by the Canadian Association for Laboratory Accreditation (CALA), in accordance with ISO/IEC 17025:2005 – *"General Requirements for the Competence of Testing and Calibration Laboratories"* for the analysis of all parameters for all samples in the scope of work for which Site Condition Standards have been established under *O. Reg. 153/04*.

4.6 Residue Management Procedures

Residue management procedures were not necessary for this investigation as a Pionjar was utilized to collect soil samples. Minimal borehole cuttings remained following the sampling process. These

remaining soils were used along with bentonite to backfill the borehole. No visual or olfactory evidence of environmental contamination was apparent.

4.7 Elevation Surveying

Elevation surveying of the three (3) monitoring wells utilized for this investigation was conducted as part of the concurrent Hydrogeological Investigation. Surveying was conducted by JD Barnes.

4.8 Quality Assurance and Quality Control Measures

Soil samples were collected in accordance with accepted industry standards. Sampling, transportation and storage procedures were conducted according to *CCME Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites* and the *MOE Guidance on Sampling and Analytical Methods for use at Contaminated Sites in Ontario* and followed standard chain of custody procedures. All containers used for sampling were provided by the laboratory and were labelled prior to sampling, taking caution not to open the container. All equipment used for sampling was washed with an Alconox solution and rinsed in between samples and a new pair of Nitrile gloves was worn for each sample.

The field quality control measures included the collection of duplicate samples at a minimum of one (1) duplicate for every ten (10) samples for each media sampled. One (1) duplicate soil sample and one (1) duplicate ground water sample was included in the laboratory analysis. Also included were trip blanks for groundwater and soil.

The laboratory quality control program included the analysis of laboratory duplicate samples, method blanks, matrix spikes, and samples of reference materials in accordance with the laboratories QC protocols. Quality control reports comprise portions of the Certificates of Analysis in **Appendix D**. Maxxam reviews, validates and signs off on all analytical data and QC for the report.

4.9 Health and Safety Program

Before commencing the fieldwork, a site specific Health and Safety Program was developed for the fieldwork to be conducted at the Site. The program incorporates the Cole Engineering Group Ltd. (CEG) Health and Safety Policy, the responsibilities for the project managers, technicians and sub-contractors, an outline of potential incidents typical for this type of project and emergency procedures to follow in case of injury. Mandatory and optional personal protective equipment were outlined.

Prior to starting field activities, CEG personnel completed health and safety training for education with regards to industry related risks and appropriate mitigative actions.

The fieldwork was completed in accordance with the Ontario Ministry of Labour safety regulations and CEG's Health and Safety Plan. Standard personal protective equipment including hard hat, steel-toed boots, reflector vests, etc. was worn by each employee on-site. For personal protection, nitrile gloves were worn when handling soil and groundwater.

5.0 Review and Evaluation

5.1 Soil

5.1.1 Field Screening

Field screening for organic vapour concentrations, which were collected in the headspace of soil samples within Ziploc™ bags, was conducted using a RKI Eagle with methane elimination. Vapour concentration readings were observed to be below 5 ppm.

5.1.2 Soil Sampling Analytical Results and Quality Assessment

The results of the soil analyses were compared to the applicable Table 2 SCS for coarse-grained materials for residential/parkland/institutional property use. Soil samples were collected for OC Pesticides, PHC fractions F1-F4 and VOCs. VOC and petroleum hydrocarbon fraction F1 samples were collected via TerraCore samplers and preserved with methanol during the field investigation prior to submission to the laboratory.

The results are summarized in the following sections:

OC Pesticides

The results of the soil analyses for OC Pesticides indicated that concentrations in all samples submitted for analysis met the Table 2 SCS. Analytical results for the soil samples analyzed for OC Pesticides are presented in **Table C-1** of **Appendix C.**

VOCs

The results of the soil analyses for VOCs indicated that concentrations in all samples submitted for analysis met the Table 2 SCS. Analytical results for the soil samples analyzed for VOCs are presented in **Table C-2** of **Appendix C.**

PHC Fractions F1-F4

The results of the soil analyses for PHC fractions F1-F4 indicated that concentrations in all samples submitted for analysis met the Table 2 SCS. Analytical results for the soil samples analyzed for PHC fractions F1-F4 are presented in **Table C-2** of **Appendix C.**

5.2 Groundwater

5.2.1 Elevations and Flow Direction

Based on the results from the Phase I ESA conducted by CEG, it was determined prior to the Phase II ESA investigation that the water table should be present at approximately 1-4 mbg. Based on the borehole logs reviewed, the monitoring wells were screened in units that were found to contain groundwater.

In order to gain an understanding of groundwater flow direction at the Site, survey data from the Hydrogeological Investigation was reviewed. Monitoring wells were surveyed to obtain relative elevations of the ground surface and top of the PVC riser pipe. Table 5.1 summarizes the survey data collected and relative groundwater elevations.

Table 5.1 Survey Data

Monitoring Well ID	Northing	Easting	Ground Elevation (m)	Top of Pipe Elevation (m)	Stick up (m)	Depth to Water (mbtp) *Mar 14*	Depth to Water (mbgs) *Mar 14*	Ground Water Elevation (m) *Mar 14*
MW1-D	4878050	620780	276.49	277.55	1.06	2.75	1.69	274.8
MW1-S	4878050	620781	276.59	277.63	1.04	2.43	1.38	275.2
MW11-S	4878721	620764	277.33	278.41	1.08	3.82	2.73	274.6

The measurements of groundwater levels and the presence of petroleum hydrocarbon free-product were obtained using a Heron H.Oil Standard Oil/Water Interface Meter. Measurements were taken after allowing the water levels to recover to static conditions. Table 5.2 summarizes the results of measurements taken for groundwater and free-product levels.

Table 5.2 Groundwater and Free-Product Measurements

Monitoring Well ID	Depth (mbtp)	Date	Depth to Water (mbtp)	Groundwater Elevation (m)	Depth to Free-product (mbtp)
MW1-D	11.8	March 14, 2012	2.75	274.8	-
MW1-S	7.1	March 14, 2012	2.43	275.2	-

Information regarding the groundwater flow direction was obtained from the Hydrogeological Investigation currently being undertaken by CEG.

At a regional scale, groundwater flows in northerly towards Lake Simcoe. On the site, water levels measured at shallow screened wells indicate that the groundwater generally flows in a south easterly direction. However, many areas of the site have been altered from their original condition and may affect localized flow patterns. For example drainage ditches, underground utilities and services my cause groundwater to flow direction to differ from the observed south easterly flow pattern. The interpreted groundwater flow direction map for the Site is presented as **Figure 4**.

The coarse grained beds commonly found in utility corridors present a preferential pathway for contaminants.

5.2.2 Groundwater Sampling Analytical Results and Quality Assessment

The results of the groundwater analyses were compared to the applicable *O.Reg. 153/04 Table 2: Potable Ground Water* standards for coarse-grained materials for all property use. Groundwater samples were collected for OC Pesticides, PHC fractions F1-F4, BTEX and VOCs. Zero headspace was maintained for VOCs samples. Table 5.3 summarizes the samples collected and analyses performed for each sample.

Table 5.3 Sample Description and Analysis Performed (Groundwater)

Matrix	Sample ID	Depth (mbg)	Analysis Performed
Groundwater	MW1-D	Screen interval: 10.3-11.8	PHC fractions F1-F4, VOCs

Table 5.3 Sample Description and Analysis Performed (Groundwater)

Matrix	Sample ID	Depth (mbg)	Analysis Performed
Groundwater	MW1-S	Screen interval: 1.52-3.05	PHC fractions F1-F4, VOCs
Groundwater	MW11-S	Screen interval: 3.97-7.02	OC Pesticides

The results are summarized in the following sections:

PHC Fractions F1-F4, BTEX

The results of the groundwater analyses for PHC fractions F1-F4 and BTEX indicated that concentrations met the applicable Table 2 SCS for all samples submitted for analysis. Analytical results for groundwater PHC fractions F1-F4 and BTEX are presented in **Table C-3** of **Appendix C.**

VOCs

The results of the groundwater analyses for VOCs indicated that concentrations met the applicable Table 2 SCS for all samples submitted for analysis. Analytical results for groundwater VOCs are presented in **Table C-4** of **Appendix C**.

OC Pesticides

The results of the groundwater analyses for OC Pesticides indicated that concentrations met the applicable Table 2 SCS for all samples submitted for analysis. Analytical results for groundwater OC Pesticides are presented in **Table C-5** of **Appendix C**.

5.3 Quality Assurance and Quality Control Results

One (1) duplicate soil sample and one (1) duplicate ground water sample were collected throughout the course of the investigation. Also included was two (2) trip blanks for water and one (1) trip blank for soil. The laboratory included QA/QC results with the certificate of analysis as described in Section 4.8. The Relative Percentage Difference (RPD) values are within acceptable ranges for the industry and are reported in **Appendix C**. The laboratory reported acceptable QA/QC results.

5.4 Phase Two Conceptual Site Model

The surficial geology of the Site consists of clays with some silt, sand, and gravel at deeper depths. The topography at the Site has been landscaped to appear generally rolling with some flat areas. Locally, the topography slopes toward the SWM ponds on site. Generally, there is a downward north-westerly slope toward Ansnorveldt Creek, and south-easterly slope toward Western Creek. On a regional scale, the land slopes north towards Lake Simcoe. Based on the groundwater elevation measurements, the local groundwater flows in an inferred south-easterly direction. Based on the results of the Phase I ESA, it is assumed that the depth to bedrock in the vicinity of the Site is approximately 100 mbg. Based on the results of the Hydrogeological Investigation being conducted concurrently on-site by CEG, the depth of the water table is approximately 0.4-2.7 mbg.

There is the potential that spills may have occurred as a result of the use and mixing of pesticides and/or herbicides on-site as well as off-site. Although the half-life of most pesticides and herbicides is quite short when sprayed, the potential exists for larger spills to have occurred and not been reported resulting in soil contamination. However, concentrations of OC Pesticides were not found to be present in the subsurface soils at levels which exceed the applicable Table 2 SCS.

Fuel storage tanks that are active and were used historically off-site (approximately 100 m to the south of the Site) may have leaked or spilled and resulted in soil contamination. It is possible that free-product may have discharged from the tanks and into the surrounding soils as a result of improper storage or refuelling. However, concentrations of petroleum hydrocarbon fractions F1 to F4 were not found to be present in the subsurface soils or ground water at levels which exceed the applicable Table 2 SCS. Also, pathways introduced by road bedding and underground utilities could act to transmit potential concerns away from the Site. Visual and olfactory observations did not detect PHC contamination in the soils explored in this location.

Water level and petroleum hydrocarbon free-product measurements obtained from the on-site well did not reveal evidence of free-product.

6.0 Conclusions and Recommendations

The investigation program included the collection of surficial and subsurface soil samples in areas deemed most likely to have been affected by potentially contaminating activities. Groundwater samples were also collected from existing monitoring wells installed on-site during the Hydrogeological Investigation being conducted concurrently by CEG. A total of two (2) subsurface soil samples and four (4) surficial soil samples (including one (1) duplicate and one (1) trip blank) were collected in locations selected to be most likely to contain contaminated materials. A total of three (3) groundwater samples (plus one (1) duplicate and two (2) trip blanks) were collected from three (3) existing monitoring wells selected based on proximity to areas of potential environmental concern. The purpose of the study was to investigate the potential for the presence of on-site contamination related to on-site concerns stemming from pesticide use and off-site concerns related to fuel storage.

The soil samples analyzed were compared to the applicable *Soil and Groundwater Standards – Table 2 Potable Groundwater - as amended April 15, 2011* for Residential/Parkland/Institutional Property Use for Coarse-Grained Materials. Groundwater samples were compared to the applicable *Soil and Groundwater Standards – Table 2 Potable Groundwater - as amended April 15, 2011* for All Types of Property Use for Coarse-Grained Materials.

The results of the soil analyses for OC Pesticides, VOCs and PHC fractions F1-F4 indicated that all samples submitted for analysis met the applicable Table 2 SCS.

The results of the groundwater analyses indicated that all samples submitted for analysis met the applicable Table 2 SCS.

Based on the findings of our soil and groundwater sampling program, contamination was not identified on the property. No further investigation is recommended.

Prepared by:

COLE ENGINEERING GROUP LTD.

Tabitha Lee, M.A.Sc., P.Eng.
Business Unit Leader

Andre Lyn, B.E.S., P.Geo. (Ltd.)
Project Manager

/ao

Limiting Conditions

This report was prepared solely for use by Ms. Joanna Barnett of The Kerbel Group Inc.

The findings contained herein have been produced in accordance with generally accepted environmental site assessment protocol. Cole Engineering Group Ltd. (CEG) believes that the data presented in this report concerning the subject Site is reliable at the time it was collected. CEG does not guarantee that the information provided is absolutely accurate beyond current accepted environmental site assessment standards. There is a possibility that items of environmental concern could not be identified within the scope of the assessment or were not apparent during the Site visit.

7.0 References

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Figures

Source: Google Earth, 2012 (2009 image)
Google Maps, 2011 (Key Map)
Produced by Cole Engineering under license from Ontario Ministry of Natural Resources
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LEGEND

Site

Road

Arterial

Collector

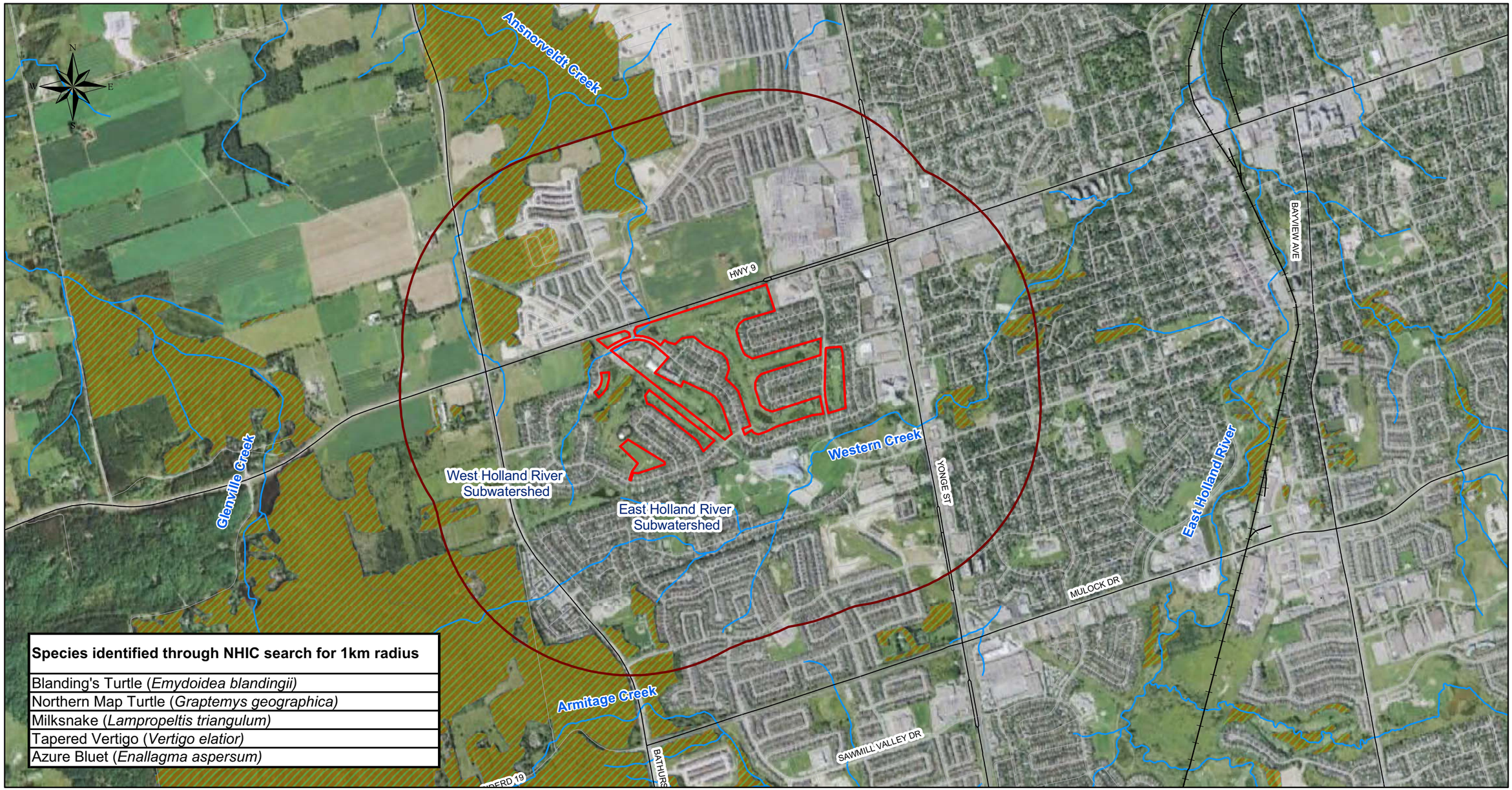
Site Location Map

Phase II Environmental Site Assessment
Marianneville Development Limited
470 Crossland Gate, Newmarket, ON

COLE ENGINEERING

Figure No. 1

Project No:	L09-301
Drawn By:	AC
Checked by:	TL
Date:	March 2012



Source: Google Earth, 2011 (2009 image)
Produced by Cole Engineering under license from Ontario Ministry of Natural Resources
Copyright (c) Queen's Printer, 2010
Ministry of Natural Resources, Natural Heritage Information Centre, 2011

LEGEND

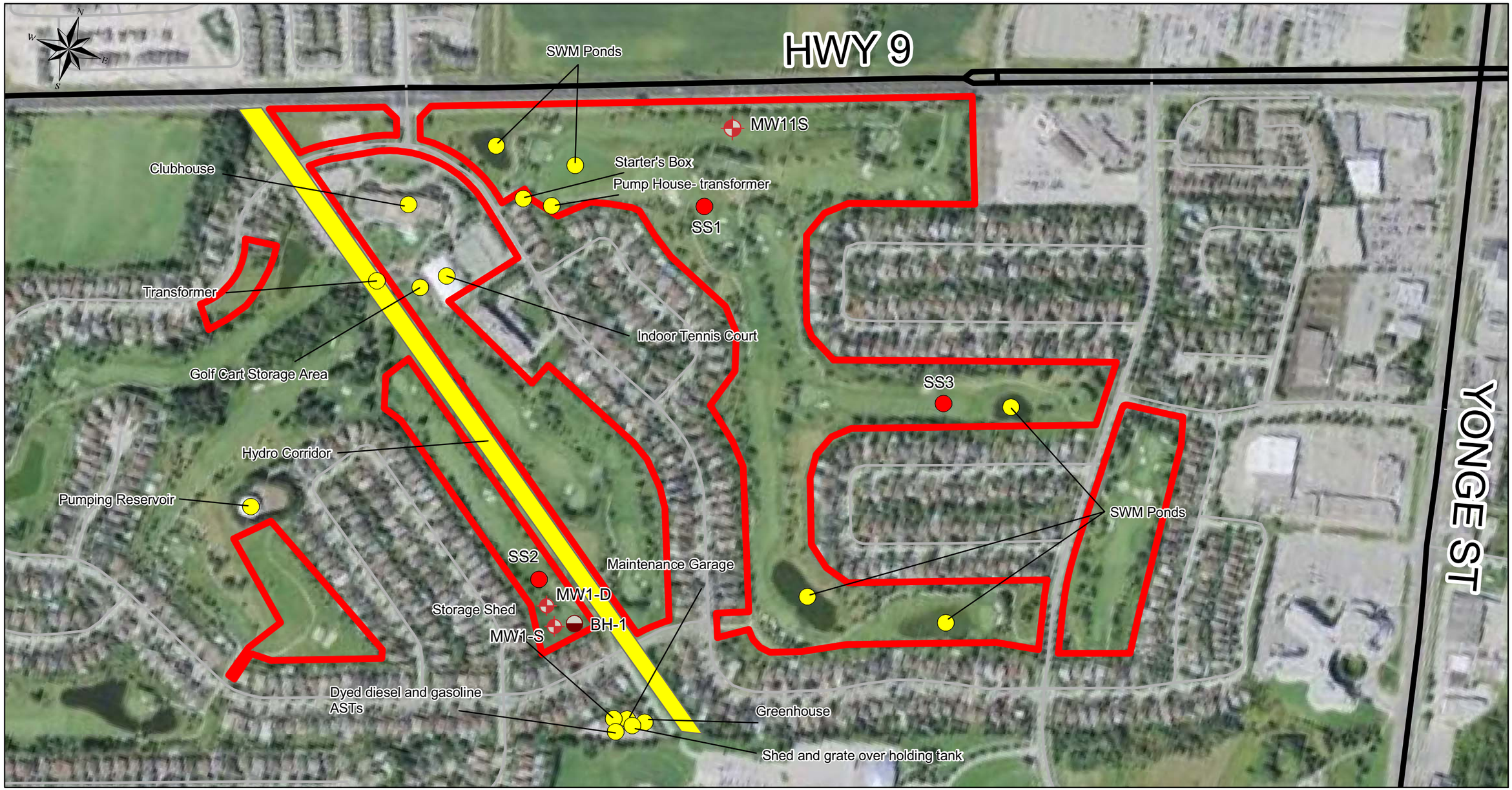
- Site
- 1 km Buffer Around Site
- **Road**
- Arterial
- Collector
- Railway
- Waterbody
- Watercourse
- Wooded Area

Areas of Natural Significance

Phase II Environmental Site Assessment
Marianneville Development Limited
470 Crossland Gate, Newmarket, ON

COLE ENGINEERING

Project No:	L09-301
Drawn By:	AC
Figure No.	2
Checked by:	TL
Date:	March 2012



0 50 100 200 300 400 m

Source: Google Earth, 2011 (2009 image)
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LEGEND

- Site
- **Road**
  - Arterial
  - Collector
- Hydro-Corridor
- Borehole
- Surficial Soil Sample
- Monitoring Well

Site Plan

Phase II Environmental Site Assessment
Marianneville Development Limited
470 Crossland Gate, Newmarket, ON

COLE ENGINEERING

Project No:	L09-301
Drawn By:	AC
Checked by:	TL
Date:	March 2012

Figure No. 3

Source: Google Earth, 2011 (2009 image)
Produced by Cole Engineering under license from Ontario Ministry of Natural Resources
Copyright (c) Queen's Printer, 2010

LEGEND

- Site
- **Road**
  - Arterial
  - Collector
- Monitoring Well
- Groundwater Flow Direction (interpreted)

Interpreted Ground Water Flow Direction Map

Phase II Environmental Site Assessment
Marianneville Development Limited
470 Crossland Gate, Newmarket, ON

COLE ENGINEERING

Project No:	L09-301
Drawn By:	AO
Checked by:	TL
Date:	March 2012

Figure No. **4**

Appendix A

Utility Locates

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Primary Locate Sheet

Request #: 2012054331

Tel:	Fax:	Toll Free:	Email:
905-479-5674	905-479-8628		

Utilities ☑Telecom ☑Gas ☐Hydro ☐Street Lighting Located ☐ ☐ ☐	Revised Work Date (mm/dd/yyyy):	Work Date (mm/dd/yyyy): Feb 9 2012	Request Type Status: ☐ Homeowner ☑ Contractor ☐ Project

Requested By:	Company (if applicable):	Tel:	Fax/email:
ALEXANDRA CHAN	COLE ENGINEERING	905-940-6161	905-940-2064

Appt. Date:	Received Date:	Locate Address:
	Feb 2 2012	470 CROSSLAND GATE [ALEX DONER DR & EAGLE ST W]

Type of Work:	City:
ENVIRONMENTAL	NEWMARKET, ONTARIO

Caller's Remarks:
RELOCATE OF 2012045927. W1201271555110 SEE SKETCH- 4 BOREHOLES ON FAIRWAY OF GOLF COURSE, LOCATE ENTIRE SOUTHERN PARCEL. FRONT, SIDE, BACK-**MEET REQUIRED SOUTHERN PARCEL REQUIRED ONLY NOT LOCATED CORRECTLY FIRST TIME**- DAVIS DR & EAGLE ST W-REL 2012045927 DEPTH UNKNOWN

Telecom		Gas		Hydro		Street Lighting									
Mark	Clear	Mark	Clear	Mark	Clear	Mark	Clear	Mark	Clear	Mark	Clear	Mark	Clear	Mark	Clear
	1		1												

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

Records Reference:

☐ Map ☑ Network X #
☐ Byers ☑ Datapak IHD3015CLI
Field Notes: N/A
Other: KW189,KW190
DPT Remarks:

☐ Third Party Notification
BCGN01 ENGN01
routine (STANDARD)
WAP #: Unit/Lot:

Apply Sticker here if Required

Method of Field Marking: ☑Paint ☐Stakes ☐Flags ☐Offset Flags ☐Other (Telecom=Orange, Gas=Yellow, Hydro=Red)

Caution: Locates are VOID after 30 days. See Disclaimer on reverse side for the specific Facility Owner's Guildelines.

Caution: Any changes to location or nature of work requires a new locate. Excavator must not work outside the Located Area without a new locate. Privately owned services within the located area have not been marked - check with service/property owner. For all Locate requests including remarks contact:
Ontario One Call at 1-800-400-2255 or www.on1call.com

Locator Name:	Start Time:	☑ Mark & Fax ☐ Left on Site ☐ Emailed
Patrick Loughlin	2:40 PM	
ID #: 211	End Time: 3:35 PM	Locate Received By: Print: ALEXANDRA CHAN
Date (mm/dd/yyyy): Feb 7 2012	Total Hours:	Signature:

A copy of this Primary Locate Sheet and Auxiliary Locate Sheet(s) must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Auxiliary Locate Sheet

Request #: 2012054331

Tel: 905-479-5674 | Fax: 905-479-8628 | Toll Free: | Email:

Utilities ☑Telecom ☑Gas ☐Hydro ☐Street Lighting

Located ☐ ☐ ☐

Date Located: Feb 7 2012

Number of Services marked: (Specify building/house numbers)
0

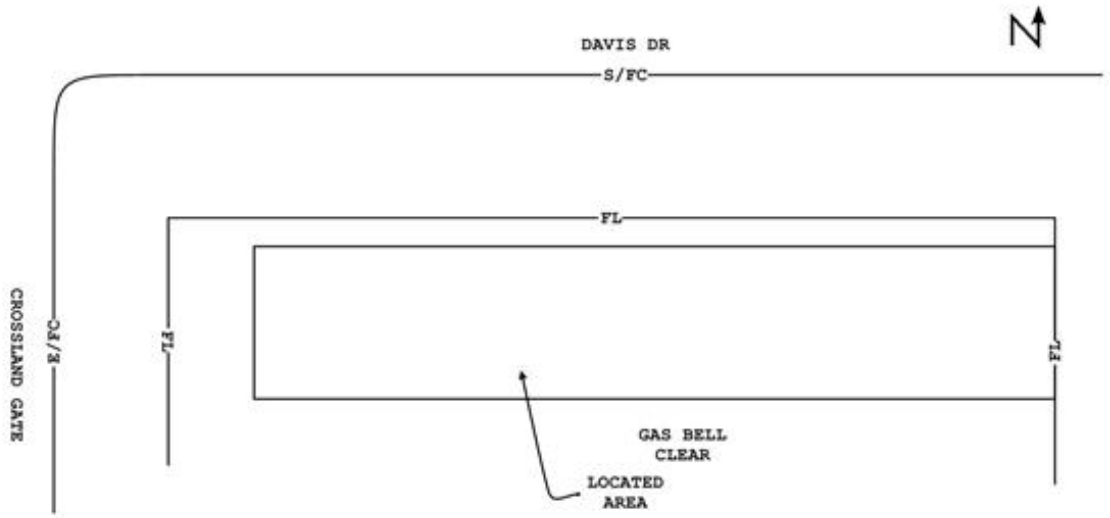
LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

FROM: 1.0M S OF FL S/S/FC DAVIS DR	TO: 100.0M S/S/FC DAVIS DR
FROM: 20.0M E/E/FC CROSSLAND GATE	TO: 2ND FL E/E/FC CROSSLAND GATE

Legend

Building Line	—BL—
Fence Line	—FL—
Face of Curb	—FC—
Road Edge	—RE—
Property Line	—PL—
Driveway	—DW—
Catch Basin	CB
Sidewalk	SW
Demarcation	DM
Railway	###
Pole	○
Flush to Gate Pedestal	FTG
Pedestal	X
Buried Cable	—B—
Conduit	—C—
Buried Service Wire	—BSW—
Manhole	MH
Fiber Optic Cable	—FO—
Gas Main	—GM—
Gas Service	—GS—
Gas Valve	▬▬
Hydrant	☼
Transformer	▲
Hydro	—H—
Hydro Pole	X
Street Light Cable	—SL—
Street Light	☼
North	N
South	S
East	E
West	W

Hand dig cautiously within 1m as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable.
If you damage underground plant, contact the facility owner immediately.
Depth varies and MUST be verified by hand digging or vacuum excavation.
LOCATED AREAS HAS BEEN ALTERED AS PER:



THIS FORM VALID ONLY WITH Primary Locate Form. This sketch is not to scale.
Any privately owned services, including sewer service lines, within the located area have not been marked - check with the service/property owner.

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Auxiliary Locate Sheet

Request #: 2012054331

Tel: 905-479-5674 | Fax: 905-479-8628 | Toll Free: | Email:

Utilities ☑ Telecom ☑ Gas ☐ Hydro ☐ Street Lighting

Located ☐ ☐ ☐

Date Located: Feb 7 2012

Number of Services marked: (Specify building/house numbers)
0

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

FROM	TO
40.0M W/W/FC EAGLE ST	10.0M W/W/FC JOHN BOWSER CRES
40.0M S/S/FC JOHN BOWSER CRES	40.0M N/N/FC GLENWAY CIR

Legend	
Building Line	—BL—
Fence Line	—FL—
Face of Curb	—FC—
Road Edge	—RE—
Property Line	—PL—
Driveway	—DW—
Catch Basin	CB
Sidewalk	SW
Demarcation	DM
Railway	###
Pole	○
Flush to Gate Pedestal	FTG
Pedestal	X
Buried Cable	—B—
Conduit	—C—
Buried Service Wire	—BSW—
Manhole	MH
Fiber Optic Cable	—FO—
Gas Main	—GM—
Gas Service	—GS—
Gas Valve	▬▬
Hydrant	☼
Transformer	▲
Hydro	—H—
Hydro Pole	X
Street Light Cable	—SL—
Street Light	☼
North	N
South	S
East	E
West	W

Hand dig cautiously within 1m as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable.
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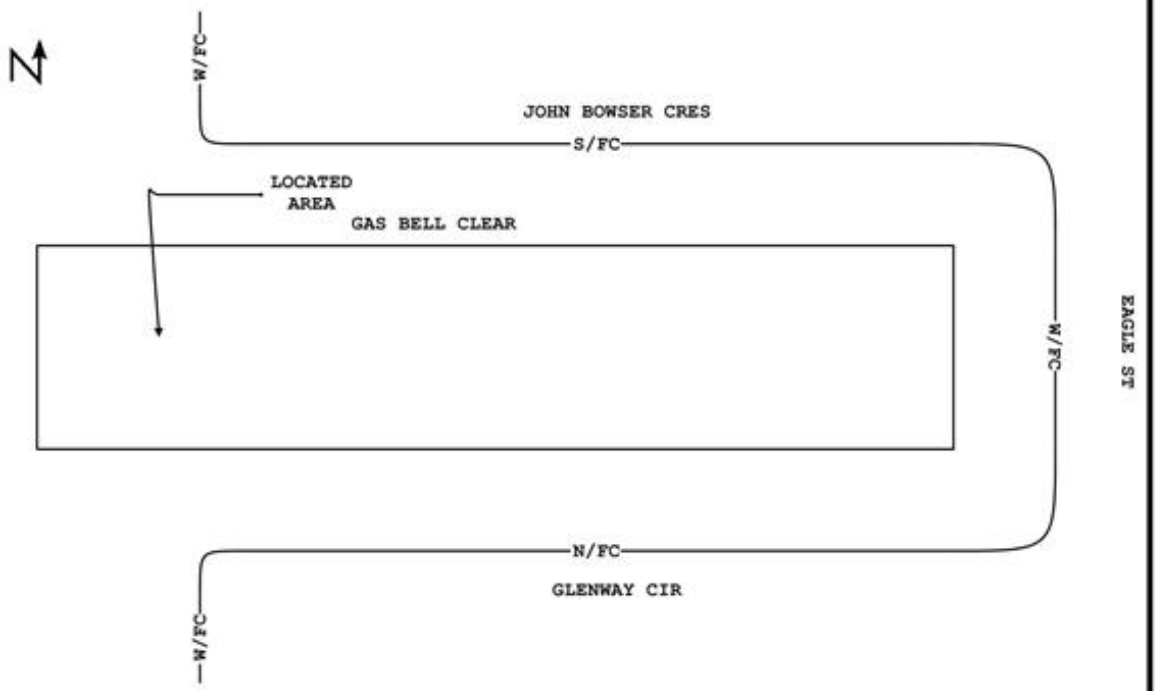
LOCATED AREAS HAS BEEN ALTERED AS PER:



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CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Auxiliary Locate Sheet

Request #: 2012054331

Tel: 905-479-5674 | Fax: 905-479-8628 | Toll Free: | Email:

Utilities ☑Telecom ☑Gas ☐Hydro ☐Street Lighting

Located ☐ ☐ ☐

Date Located: Feb 7 2012

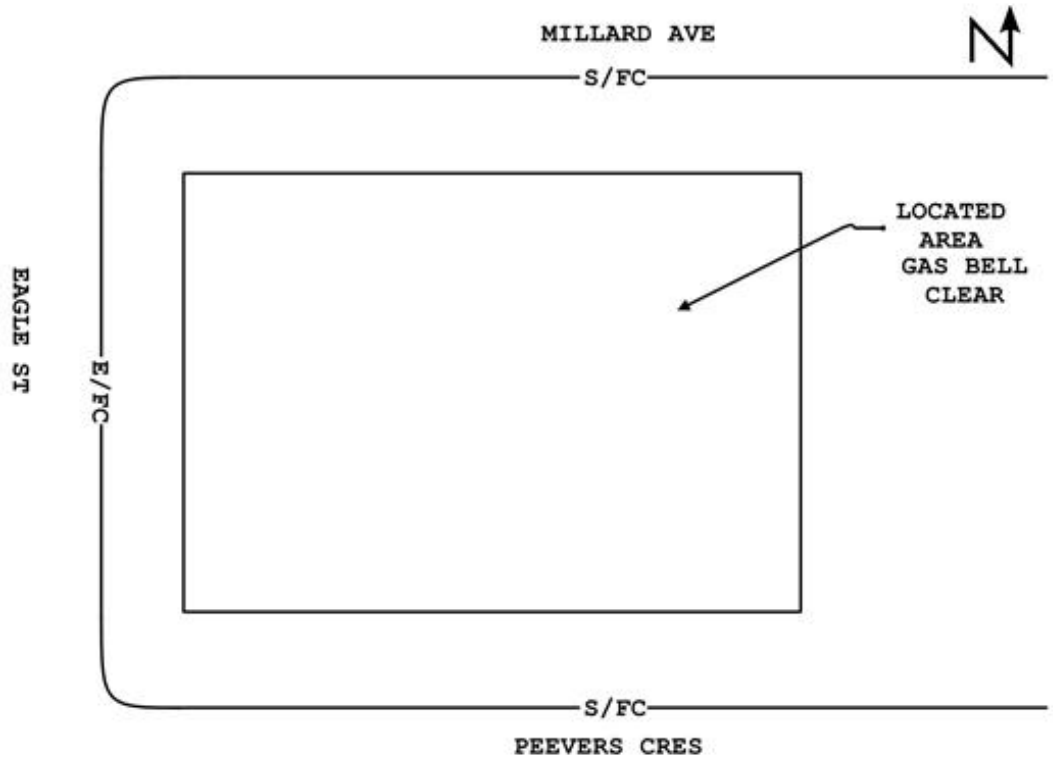
Number of Services marked: (Specify building/house numbers)
0

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

FROM: 10.0M E/E/FC EAGLE ST	TO: 100.0M E/E/FC EAGLE ST
FROM: 10.0M S/S/FC MILLARD AVE	TO: 10.0M N/N/FC PEEVERS CRES

Legend	
Building Line	—BL—
Fence Line	—FL—
Face of Curb	—FC—
Road Edge	—RE—
Property Line	—PL—
Driveway	—DW—
Catch Basin	CB
Sidewalk	SW
Demarcation	DM
Railway	###
Pole	○
Flush to Gate Pedestal	FTG
Pedestal	X
Buried Cable	—B—
Conduit	—C—
Buried Service Wire	—BSW—
Manhole	MH
Fiber Optic Cable	—FO—
Gas Main	—GM—
Gas Service	—GS—
Gas Valve	▬▬
Hydrant	☼
Transformer	▲
Hydro	—H—
Hydro Pole	X
Street Light Cable	—SL—
Street Light	☼
North	N
South	S
East	E
West	W

Hand dig cautiously within 1m as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable.
If you damage underground plant, contact the facility owner immediately.
Depth varies and MUST be verified by hand digging or vacuum excavation.
LOCATED AREAS HAS BEEN ALTERED AS PER:



THIS FORM VALID ONLY WITH Primary Locate Form. This sketch is not to scale.
Any privately owned services, including sewer service lines, within the located area have not been marked - check with the service/property owner.

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Auxiliary Locate Sheet

Request #: 2012054331

Tel: 905-479-5674 | Fax: 905-479-8628 | Toll Free: | Email:

Utilities ☑Telecom ☑Gas ☐Hydro ☐Street Lighting

Located ☐ ☐ ☐

Date Located: Feb 7 2012

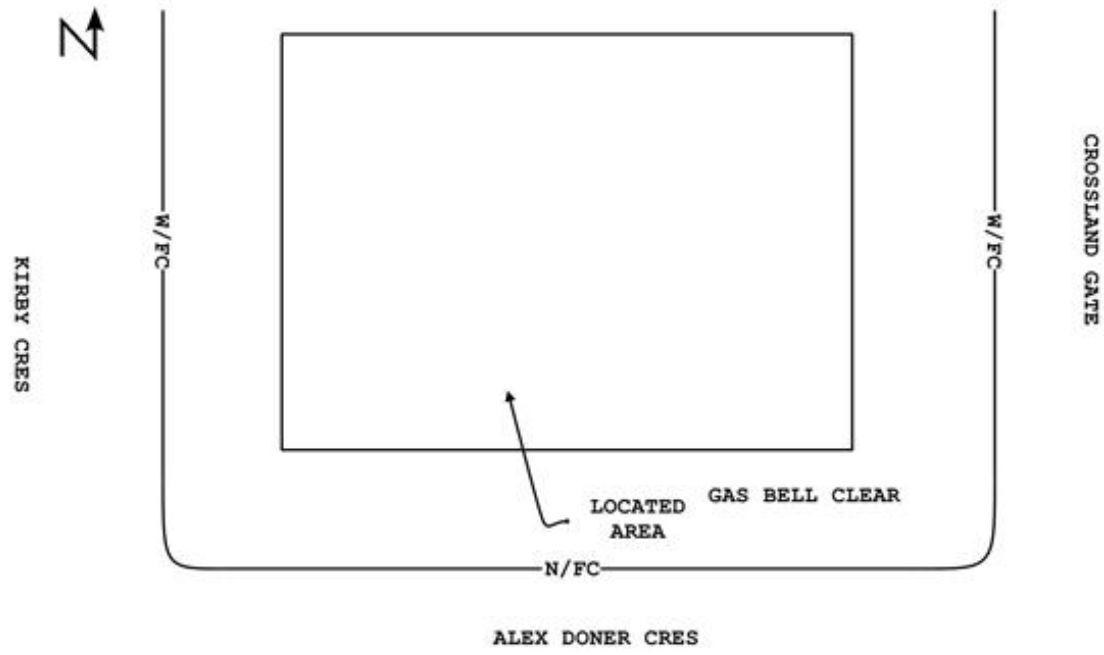
Number of Services marked: (Specify building/house numbers)
0

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

FROM: 40.0M N/N/FC ALEX DONER CRES	TO: 500.0M N/N/FC ALEX DONER CRES
FROM: 40.0M E/E/FC KIRBY CRES	TO: 40.0M W/W/FC CROSSLAND GATE

Legend	
Building Line	—BL—
Fence Line	—FL—
Face of Curb	—FC—
Road Edge	—RE—
Property Line	—PL—
Driveway	—DW—
Catch Basin	CB
Sidewalk	SW
Demarcation	DM
Railway	###
Pole	○
Flush to Gate Pedestal	FTG
Pedestal	X
Buried Cable	—B—
Conduit	—C—
Buried Service Wire	—BSW—
Manhole	MH
Fiber Optic Cable	—FO—
Gas Main	—GM—
Gas Service	—GS—
Gas Valve	▬▬
Hydrant	☼
Transformer	▲
Hydro	—H—
Hydro Pole	X
Street Light Cable	—SL—
Street Light	☼
North	N
South	S
East	E
West	W

Hand dig cautiously within 1m as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable.
If you damage underground plant, contact the facility owner immediately.
Depth varies and MUST be verified by hand digging or vacuum excavation.
LOCATED AREAS HAS BEEN ALTERED AS PER:



THIS FORM VALID ONLY WITH Primary Locate Form. This sketch is not to scale.
Any privately owned services, including sewer service lines, within the located area have not been marked - check with the service/property owner.

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

Auxiliary Locate Sheet

Request #: 2012054331

Tel:	Fax:	Toll Free:	Email:
905-479-5674	905-479-8628		

Utilities ☑Telecom ☑Gas ☐Hydro ☐Street Lighting

Located ☐ ☐ ☐

Date Located: Feb 7 2012

Number of Services marked: (Specify building/house numbers)
0

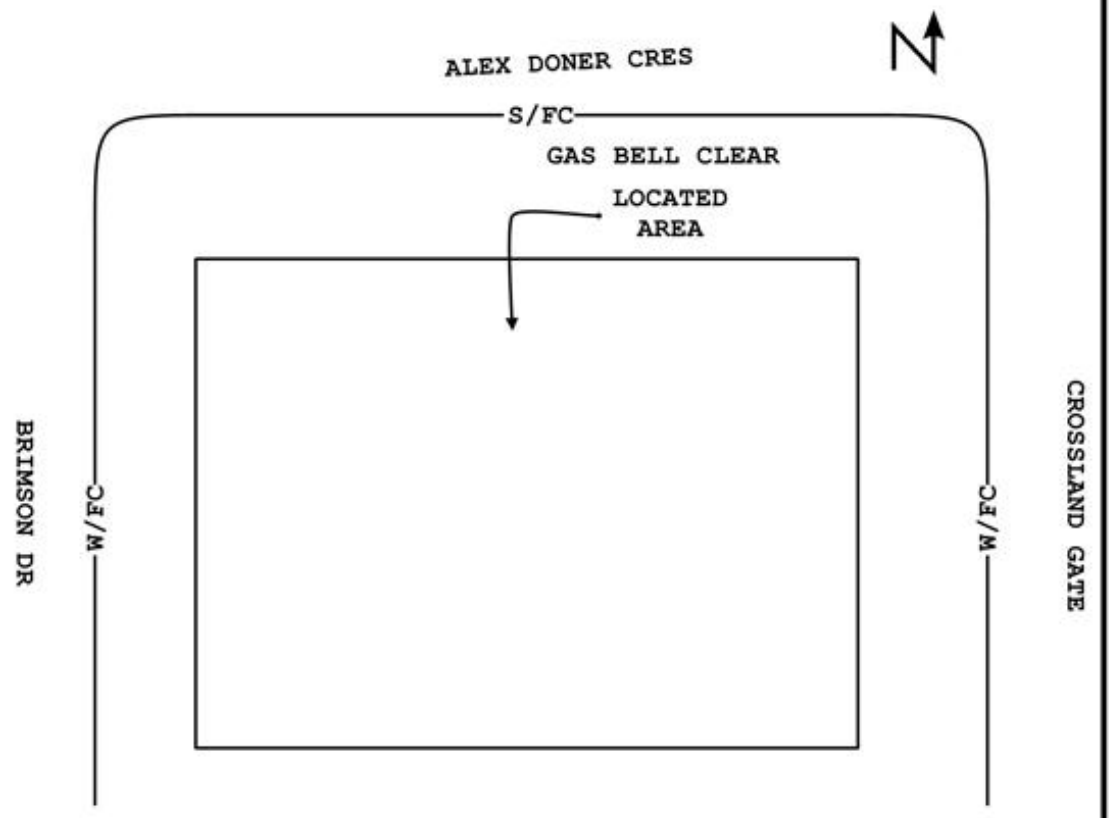
LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

FROM:	TO:
40.0M S/S/FC ALEX DONER CRES	100.0M S/S/FC ALEX DONER CRES
40.0M W/W/FC CROSSLAND GATE	40.0M E/E/FC BRIMSON DR

Legend

Building Line	—BL—
Fence Line	—FL—
Face of Curb	—FC—
Road Edge	—RE—
Property Line	—PL—
Driveway	—DW—
Catch Basin	CB
Sidewalk	SW
Demarcation	DM
Railway	###
Pole	○
Flush to Gate Pedestal	FTG
Pedestal	X
Buried Cable	—B—
Conduit	—C—
Buried Service Wire	—BSW—
Manhole	MH
Fiber Optic Cable	—FO—
Gas Main	—GM—
Gas Service	—GS—
Gas Valve	▬▬
Hydrant	⛭
Transformer	▲
Hydro	—H—
Hydro Pole	X
Street Light Cable	—SL—
Street Light	⛭
North	N
South	S
East	E
West	W

Hand dig cautiously within 1m as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable.
If you damage underground plant, contact the facility owner immediately.
Depth varies and MUST be verified by hand digging or vacuum excavation.
LOCATED AREAS HAS BEEN ALTERED AS PER:



THIS FORM VALID ONLY WITH Primary Locate Form. This sketch is not to scale.
Any privately owned services, including sewer service lines, within the located area have not been marked - check with the service/property owner.

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.

Appendix B

Borehole Logs

JOB NO: 1111-S053

LOG OF BOREHOLE NO: MW-1D

FIGURE NO: 19A

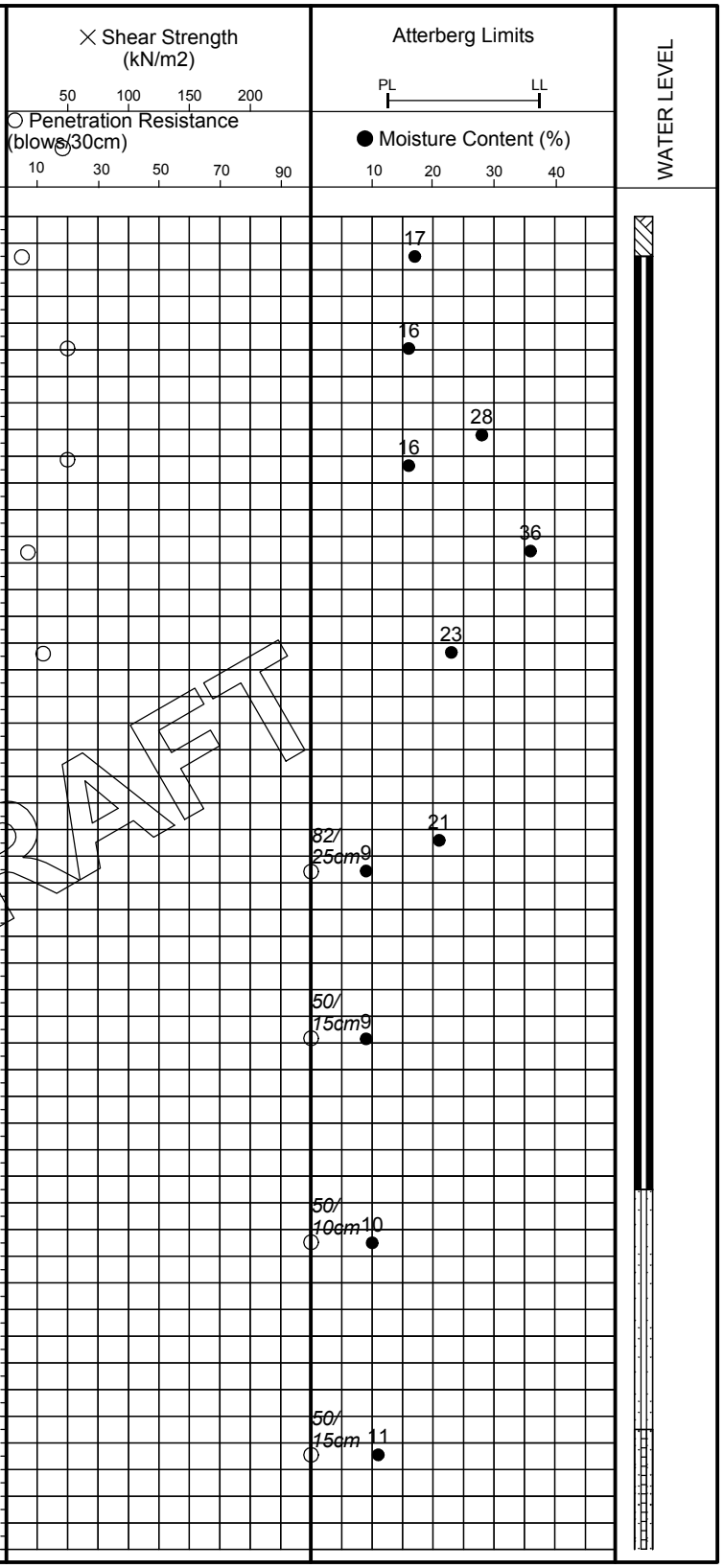
JOB DESCRIPTION: Proposed Residential Subdivision (Glenway Golf Club Redevelopment)

JOB LOCATION: Davis Drive West and Bathurst Street, Town of Newmarket

METHOD OF BORING: Flight-Auger

DATE: December 12, 2011

Depth / Elev. (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
0.0	Ground Surface			
277.0	**30 cm TOPSOIL, Fill**	1	DO	5
	Grey **SILTY CLAY, Fill** some sand and occ. topsoil incl.	2	DO	20
1.8	topsoil	3A	DO	-
275.2	Greyish-brown, firm to very stiff, weathered **SILTY CLAY** tr. to some sand occ. sand and silt seams and layers	3B	DO	20
		4	DO	7
3.0				
274.0	Brown, **SILTY CLAY, Till** some sand to sandy, a tr. of gravel occ. sand and silt seams and layers, cobbles and boulders	5	DO	12
4.8		6A	DO	-
272.2	Very dense **SILTY SAND, Till and SANDY SILT, Till** some clay, a tr. of gravel occ. sand and silt seams and layers cobbles and boulders	6B	DO	82/ 25
	brown grey	7	DO	50/ 15
		8	DO	50/ 10
		9	DO	50/ 15



Soil Engineers Ltd.

JOB NO: 1111-S053

LOG OF BOREHOLE NO: MW-1D

FIGURE NO: 19B

JOB DESCRIPTION: Proposed Residential Subdivision (Glenway Golf Club Redevelopment)

JOB LOCATION: Davis Drive West and Bathurst Street, Town of Newmarket

METHOD OF BORING: Flight-Auger

DATE: December 12, 2011

Depth Elev. (m)	SOIL DESCRIPTION	SAMPLES Number	SAMPLES Type	SAMPLES N-Value	Depth Scale (m)	× Shear Strength (kN/m2) 50 100 150 200 / ○ Penetration Resistance (blows/30cm) 10 30 50 70 90	Atterberg Limits PL LL / ● Moisture Content (%) 10 20 30 40	WATER LEVEL
10.0					10			
		10	DO	50/ 15		50/ 15cm	11	
11.0					11			
266.0	**END OF BOREHOLE**							
	Installed 50 mm standpipe to 10.6 m with 1.5 m screen. Sand backfill from 7.3 m to 10.6 m. Bentonite seal from 0.30 to 7.3 m. Concrete from 0.0 to 0.30. Provided with steel casing and lock.				12			
					13			
					14			
					15			
					16			
					17			
					18			
					19			
					20			

JOB NO: 1111-S053

LOG OF BOREHOLE NO: MW-1S

FIGURE NO: 20

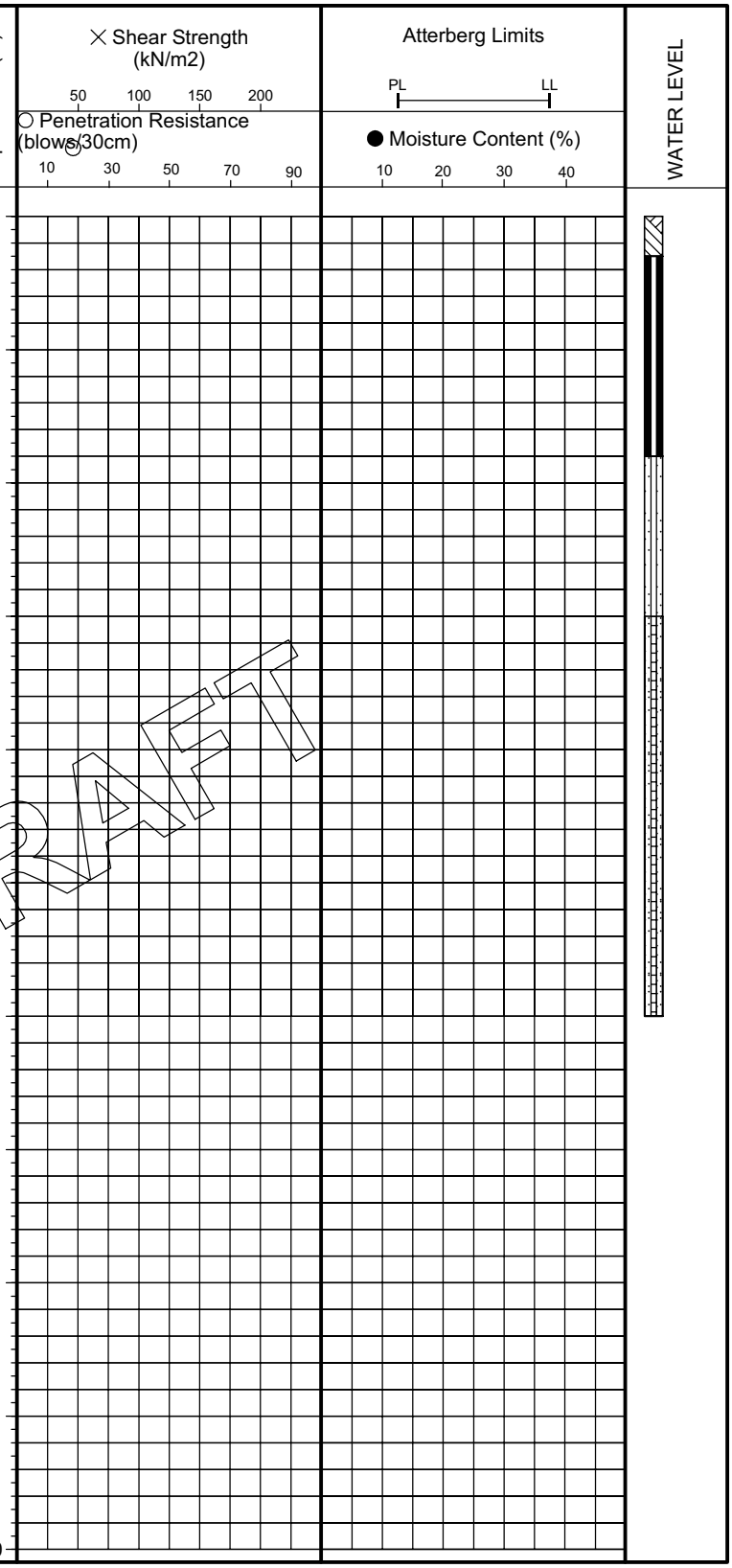
JOB DESCRIPTION: Proposed Residential Subdivision (Glenway Golf Club Redevelopment)

JOB LOCATION: Davis Drive West and Bathurst Street, Town of Newmarket

METHOD OF BORING: Flight-Auger

DATE: December 12, 2011

Depth / Elev. (m)	SOIL DESCRIPTION	SAMPLES Number	SAMPLES Type	SAMPLES N-Value
0.0	Ground Surface			
277.0	**30 cm TOPSOIL, Fill**			
	Grey **SILTY CLAY, Fill** some sand and occ. topsoil incl.			
1.8	topsoil			
275.2	Greyish-brown, firm to very stiff, weathered **SILTY CLAY** tr. to some sand occ. sand and silt seams and layers			
3.0				
274.0	Brown, **SILTY CLAY, Till** some sand to sandy, a tr. of gravel occ. sand and silt seams and layers, cobbles and boulders			
4.8				
272.2	Brown, very dense **SILTY SAND, Till and SANDY SILT, Till** some clay, a tr. of gravel occ. sand and silt seams and layers cobbles and boulders			
6.0				
271.0	**END OF BOREHOLE** Installed 50 mm standpipe to 6.0 m with 3.0 m screen. Sand backfill from 1.8 m to 6.0 m. Bentonite seal from 0.30 to 1.8 m. Concrete from 0.0 to 0.30. Provided with steel casing and lock.			



Soil Engineers Ltd.

JOB NO: 1111-S053

LOG OF BOREHOLE NO: MW-11S

FIGURE NO: 34

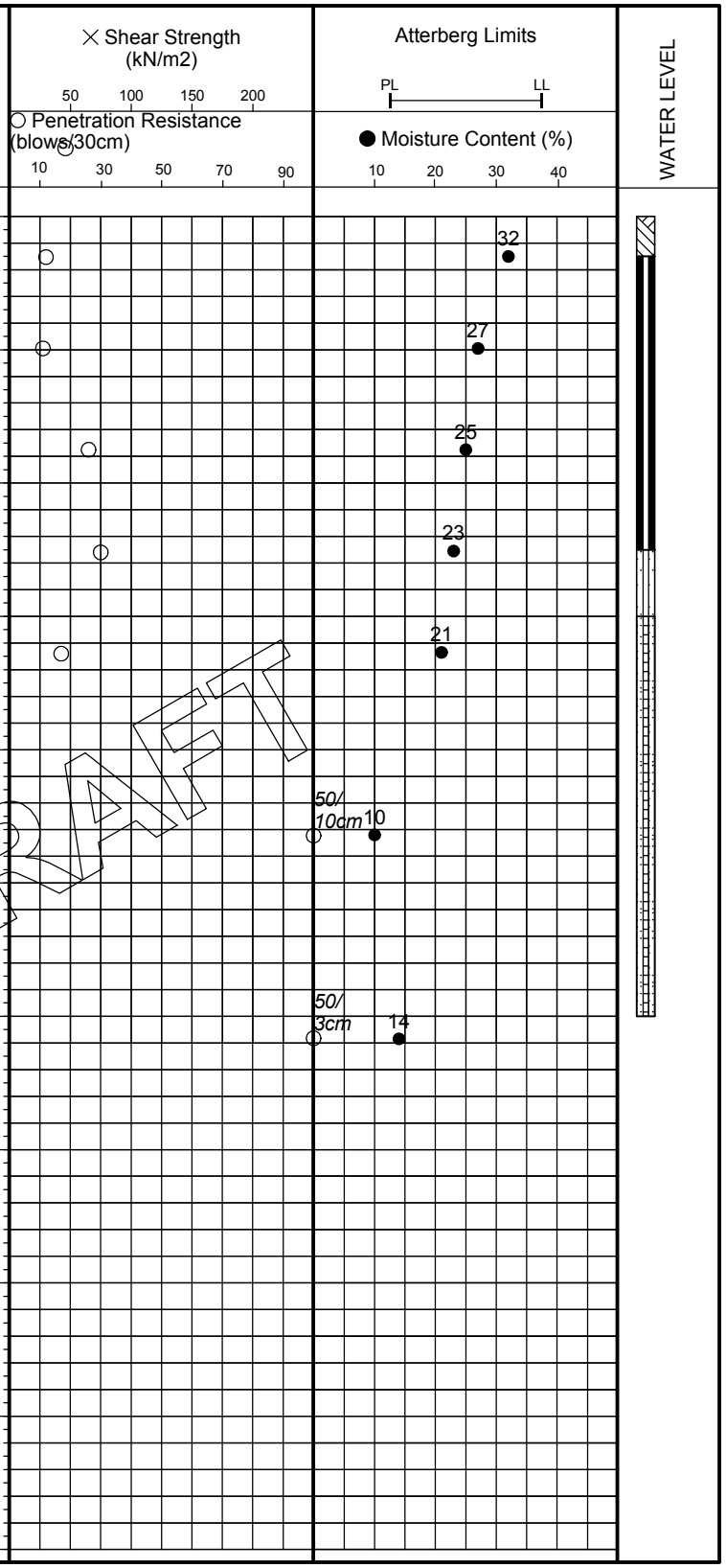
JOB DESCRIPTION: Proposed Residential Subdivision (Glenway Golf Club Redevelopment)

JOB LOCATION: Davis Drive West and Bathurst Street, Town of Newmarket

METHOD OF BORING: Flight-Auger

DATE: December 15, 2011

Depth Elev. (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
0.0	Ground Surface			
277.0	**51 cm TOPSOIL**	1	DO	12
	Brown, stiff to very stiff **SILTY CLAY** weathered tr. to some sand occ. sand and silt seams and layers	2	DO	11
		3	DO	26
2.3				
274.7	Brown, very stiff **SILTY CLAY, Till** some sand to sandy, a tr. of gravel occ. sand and silt seams and layers, cobbles and boulders	4	DO	30
		5	DO	17
4.5				
272.5	Brown, very dense **SILTY SAND, Till and SANDY SILT, Till** some clay, a tr. of gravel occ. sand and silt seams and layers cobbles and boulders	6	DO	50/10
6.2		7	DO	50/3
270.8	**END OF BOREHOLE** Installed 50 mm standpipe to 6.0 m with 3.0 m screen. Sand backfill from 2.5 m to 6.0 m. Bentonite seal from 0.30 to 2.5 m. Concrete from 0.0 to 0.30. Provided with steel casing and lock.			



Soil Engineers Ltd.

Appendix C

Analytical Results

Table C-1: Soil OC Pesticides Herbicides Analysis Results

	Units	RPI O.Reg 153/04 Table 2	SS1	SS2	RDL	SS3	RDL	DUP1 (duplicate of SS-2)	RDL
Pesticides & Herbicides									
Hexachlorobutadiene	ug/g	0.012	ND	ND	0.05	ND	0.01	ND	0.005
Hexachloroethane	ug/g	0.089	ND	ND	0.05	ND	0.01	ND	0.005
Aldrin	ug/g	0.05	ND	ND	0.02	ND	0.004	ND	0.002
a-Chlordane	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
g-Chlordane	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
Chlordane (Total)	ug/g	0.05	ND	ND	0.02	ND	0.004	ND	0.002
o,p-DDD	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
p,p-DDD	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
o,p-DDD + p,p-DDD	ug/g	3.3	ND	ND	0.02	ND	0.004	ND	0.002
o,p-DDE	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
p,p-DDE	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
o,p-DDE + p,p-DDE	ug/g	0.26	ND	ND	0.02	ND	0.004	ND	0.002
o,p-DDT	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
p,p-DDT	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
o,p-DDT + p,p-DDT	ug/g	1.4	ND	ND	0.02	ND	0.004	ND	0.002
Dieldrin	ug/g	0.05	ND	ND	0.02	ND	0.004	ND	0.002
Endosulfan I (alpha)	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
Endosulfan II	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
Total Endosulfan	ug/g	0.04	ND	ND	0.02	ND	0.004	ND	0.002
Endrin	ug/g	0.04	ND	ND	0.02	ND	0.004	ND	0.002
Heptachlor	ug/g	0.15	ND	ND	0.02	ND	0.004	ND	0.002
Heptachlor epoxide	ug/g	0.05	ND	ND	0.02	ND	0.004	ND	0.002
Hexachlorobenzene	ug/g	0.52	ND	ND	0.02	ND	0.004	ND	0.002
Lindane	ug/g	NV	ND	ND	0.02	ND	0.004	ND	0.002
Methoxychlor	ug/g	0.13	ND	ND	0.05	ND	0.01	ND	0.005
Total PCB	ug/g	0.35	ND	ND	0.3	ND	0.06	ND	0.03
Aroclor 1242	ug/g	NV	ND	ND	0.15	ND	0.03	ND	0.015
Aroclor 1248	ug/g	NV	ND	ND	0.15	ND	0.03	ND	0.015
Aroclor 1254	ug/g	NV	ND	ND	0.15	ND	0.03	ND	0.015
Aroclor 1260	ug/g	NV	ND	ND	0.15	ND	0.03	ND	0.015

ND = Non-Detect
NV = No Value
RDL = Reportable Detection Limit
Soil, Groundwater and Sediment Standards for Use Under Part XV.1 Of the Environmental Protection Act as amended April 15, 2011
RPI O.Reg 153/04 Table 2 = Table 2: Potable Ground Water - Residential/Parkland/Institutional Property Use - Coarse-Grained Materials

Table C-2: Soil BTEX, PHC and VOC Analysis Results

	Units	RPI O.Reg 153/04 Table 2	RDL	BH1-4	BH1-7	TRIP BLANK
BTEX & F1 Hydrocarbons						
Benzene	µg/L	0.21	0.02	ND	ND	ND
Toluene	µg/L	0.2	0.02	ND	ND	ND
Ethylbenzene	µg/L	1.1	0.02	ND	ND	ND
p+m-Xylene	µg/L	NV	0.02	ND	ND	ND
o-Xylene	µg/L	NV	0.02	ND	ND	ND
Xylene (Total)	µg/L	3.1	0.02	ND	ND	ND
F1 (C6-C10)	µg/L	55	10	ND	ND	-
F1 (C6-C10) - BTEX	µg/L	55	10	ND	ND	-
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	µg/L	98	10	ND	ND	-
F3 (C16-C34 Hydrocarbons)	µg/L	300	10	ND	ND	-
F4 (C34-C50 Hydrocarbons)	µg/L	2800	10	ND	ND	-
Reached Baseline at C50	-	-	-	YES	YES	-
F4 Gravimetric	µg/L	-	-	-	-	-
VOCs						
Acetone (2-Propanone)	µg/L	16	0.5	ND	ND	ND
Benzene	µg/L	0.21	0.02	ND	ND	ND
Bromodichloromethane	µg/L	1.5	0.05	ND	ND	ND
Bromoform	µg/L	0.27	0.05	ND	ND	ND
Bromomethane	µg/L	0.05	0.05	ND	ND	ND
Carbon Tetrachloride	µg/L	0.05	0.05	ND	ND	ND
Chlorobenzene	µg/L	2.4	0.05	ND	ND	ND
Chloroform	µg/L	0.05	0.05	ND	ND	ND
Dibromochloromethane	µg/L	2.3	0.05	ND	ND	ND
1,2-Dichlorobenzene	µg/L	1.2	0.05	ND	ND	ND
1,3-Dichlorobenzene	µg/L	4.8	0.05	ND	ND	ND
1,4-Dichlorobenzene	µg/L	0.083	0.05	ND	ND	ND
Dichlorodifluoromethane (FREON 12)	µg/L	16	0.05	ND	ND	ND
1,1-Dichloroethane	µg/L	0.47	0.05	ND	ND	ND
1,2-Dichloroethane	µg/L	0.05	0.05	ND	ND	ND
1,1-Dichloroethylene	µg/L	0.05	0.05	ND	ND	ND
cis-1,2-Dichloroethylene	µg/L	1.90	0.05	ND	ND	ND
trans-1,2-Dichloroethylene	µg/L	0.084	0.05	ND	ND	ND
1,2-Dichloropropane	µg/L	0.05	0.05	ND	ND	ND
cis-1,3-Dichloropropene	µg/L	0.05	0.03	ND	ND	ND
trans-1,3-Dichloropropene	µg/L	0.05	0.04	ND	ND	ND
Ethylbenzene	µg/L	1.1	0.02	ND	ND	ND
Ethylene Dibromide	µg/L	0.05	0.05	ND	ND	ND
Hexane	µg/L	2.8	0.05	ND	ND	ND
Methylene Chloride(Dichloromethane)	µg/L	0.1	0.05	ND	ND	ND
Methyl Isobutyl Ketone	µg/L	1.7	0.5	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	µg/L	16	0.5	ND	ND	ND
Methyl t-butyl ether (MTBE)	µg/L	0.75	0.05	ND	ND	ND
Styrene	µg/L	0.70	0.05	ND	ND	ND
1,1,1,2-Tetrachloroethane	µg/L	0.058	0.05	ND	ND	ND
1,1,2,2-Tetrachloroethane	µg/L	0.05	0.05	ND	ND	ND
Tetrachloroethylene	µg/L	0.28	0.05	ND	ND	ND
Toluene	µg/L	2.3	0.02	ND	ND	ND
1,1,1-Trichloroethane	µg/L	0.38	0.05	ND	ND	ND
1,1,2-Trichloroethane	µg/L	0.05	0.05	ND	ND	ND
Trichloroethylene	µg/L	0.061	0.05	ND	ND	ND
Vinyl Chloride	µg/L	0.02	0.02	ND	ND	ND
p+m-Xylene	µg/L	NV	0.02	ND	ND	ND
o-Xylene	µg/L	NV	0.02	ND	ND	ND
Xylene (Total)	µg/L	3.1	0.02	ND	ND	ND
Trichlorofluoromethane (FREON 11)	µg/L	4	0.05	ND	ND	ND

NV = No Value
ND = Not Detected
RDL = Reportable Detection Limit
Soil, Groundwater and Sediment Standards for Use Under Part XV.1 Of the Environmental Protection Act as amended April 15, 2011
RPI O.Reg 153/04 Table 2 = Table 2: Potable Ground Water - Residential/Parkland/Institutional Property Use - Coarse-Grained Materials

COLE ENGINEERING

Table C-3: Groundwater BTEX and PHC Analysis Results

	Units	O.Reg 153/04 Table 2	RDL	MW1-D	MW1-S	Dup	Trip Blank
BTEX & F1 Hydrocarbons							
Benzene	µg/L	5	0.2	ND	ND	ND	-
Toluene	µg/L	24	0.2	ND	ND	ND	-
Ethylbenzene	µg/L	2	0.2	ND	ND	ND	-
p+m-Xylene	µg/L	NV	0.2	ND	ND	ND	-
o-Xylene	µg/L	NV	0.2	ND	ND	ND	-
Xylene (Total)	µg/L	300	0.2	ND	ND	ND	-
F1 (C6-C10)	µg/L	750	25	ND	ND	ND	ND
F1 (C6-C10) - BTEX	µg/L	750	25	ND	ND	ND	ND
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	µg/L	150	100	ND	ND	ND	-
F3 (C16-C34 Hydrocarbons)	µg/L	500	100	ND	ND	ND	-
F4 (C34-C50 Hydrocarbons)	µg/L	500	100	ND	ND	ND	-
Reached Baseline at C50	-	-	-	YES	YES	YES	-
F4 Gravimetric	µg/L	-	-	-	-	-	-

NV = No Value
ND = Not Detected
RDL = Reportable Detection Limit
Soil, Groundwater and Sediment Standards for Use Under Part XV.1 Of the Environmental Protection Act as amended April 15, 2011
Criteria applicable for Table 2: Potable Ground Water - All Types of Property Use - Coarse-Grained Materials

COLE ENGINEERING

Table C-4: Groundwater VOCs Analysis Results

	Units	O.Reg 153/04 Table 2	RDL	MW1-D	MW1-S	Dup	Trip Blank
VOCs							
Acetone (2-Propanone)	µg/L	2700	10	ND	ND	ND	ND
Benzene	µg/L	5	0.2	ND	ND	ND	ND
Bromodichloromethane	µg/L	16	0.5	ND	ND	ND	ND
Bromoform	µg/L	25	1	ND	ND	ND	ND
Bromomethane	µg/L	0.9	0.5	ND	ND	ND	ND
Carbon Tetrachloride	µg/L	0.79	0.2	ND	ND	ND	ND
Chlorobenzene	µg/L	30	0.2	ND	ND	ND	ND
Chloroform	µg/L	2.4	0.2	ND	ND	ND	ND
Dibromochloromethane	µg/L	25	0.5	ND	ND	ND	ND
1,2-Dichlorobenzene	µg/L	3	0.5	ND	ND	ND	ND
1,3-Dichlorobenzene	µg/L	59	0.5	ND	ND	ND	ND
1,4-Dichlorobenzene	µg/L	1	0.5	ND	ND	ND	ND
Dichlorodifluoromethane (FREON 12)	µg/L	590	1	ND	ND	ND	ND
1,1-Dichloroethane	µg/L	5	0.2	ND	ND	ND	ND
1,2-Dichloroethane	µg/L	1.6	0.5	ND	ND	ND	ND
1,1-Dichloroethylene	µg/L	1.6	0.2	ND	ND	ND	ND
cis-1,2-Dichloroethylene	µg/L	1.6	0.5	ND	ND	ND	ND
trans-1,2-Dichloroethylene	µg/L	1.6	0.5	ND	ND	ND	ND
1,2-Dichloropropane	µg/L	5	0.2	ND	ND	ND	ND
cis-1,3-Dichloropropene	µg/L	0.5	0.3	ND	ND	ND	ND
trans-1,3-Dichloropropene	µg/L	0.5	0.4	ND	ND	ND	ND
Ethylbenzene	µg/L	2	0.2	ND	ND	ND	ND
Ethylene Dibromide	µg/L	0.20	0.2	ND	ND	ND	ND
Hexane	µg/L	51	1	ND	ND	ND	ND
Methylene Chloride(Dichloromethane)	µg/L	50	2	ND	ND	ND	ND
Methyl Isobutyl Ketone	µg/L	640	5	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	µg/L	1800	10	ND	ND	ND	ND
Methyl t-butyl ether (MTBE)	µg/L	15	0.5	ND	ND	ND	ND
Styrene	µg/L	5	0.5	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	µg/L	1.1	0.5	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	µg/L	1.0	0.5	ND	ND	ND	ND
Tetrachloroethylene	µg/L	1.6	0.2	ND	ND	ND	ND
Toluene	µg/L	24	0.2	ND	ND	0.22	ND
1,1,1-Trichloroethane	µg/L	200	0.2	ND	ND	ND	ND
1,1,2-Trichloroethane	µg/L	4.7	0.5	ND	ND	ND	ND
Trichloroethylene	µg/L	1.6	0.2	ND	ND	ND	ND
Vinyl Chloride	µg/L	0.5	0.2	ND	ND	ND	ND
p+m-Xylene	µg/L	NV	0.2	ND	ND	ND	ND
o-Xylene	µg/L	NV	0.2	ND	ND	ND	ND
Xylene (Total)	µg/L	300	0.2	ND	ND	ND	ND
Trichlorofluoromethane (FREON 11)	µg/L	150	0.5	ND	ND	ND	ND

NV = No Value
ND = Not Detected
RDL = Reportable Detection Limit
Soil, Groundwater and Sediment Standards for Use Under Part XV.1 Of the Environmental Protection Act as amended April 15, 2011
Criteria applicable for Table 2: Potable Ground Water - All Types of Property Use - Coarse-Grained Materials

COLE ENGINEERING

Table C-5: Groundwater OC Pesticides Herbicides Analysis Results

	Units	RPI O.Reg 153/04 Table 2	RDL	MW11-S
Pesticides & Herbicides				
Hexachlorobutadiene	ug/g	0.44	0.009	ND
Hexachloroethane	ug/g	2.1	0.01	ND
Aldrin	ug/g	0.35	0.005	ND
a-Chlordane	ug/g	NV	0.005	ND
g-Chlordane	ug/g	NV	0.005	ND
Chlordane (Total)	ug/g	7	0.005	ND
o,p-DDD	ug/g	NV	0.005	ND
p,p-DDD	ug/g	NV	0.005	ND
o,p-DDD + p,p-DDD	ug/g	10	0.005	ND
o,p-DDE	ug/g	NV	0.005	ND
p,p-DDE	ug/g	NV	0.005	ND
o,p-DDE + p,p-DDE	ug/g	10	0.005	ND
o,p-DDT	ug/g	NV	0.005	ND
p,p-DDT	ug/g	NV	0.005	ND
o,p-DDT + p,p-DDT	ug/g	2.8	0.005	ND
Dieldrin	ug/g	0.35	0.005	ND
Endosulfan I (alpha)	ug/g	NV	0.005	ND
Endosulfan II	ug/g	NV	0.005	ND
Total Endosulfan	ug/g	1.5	0.005	ND
Endrin	ug/g	0.48	0.005	ND
Heptachlor	ug/g	1.5	0.005	ND
Heptachlor epoxide	ug/g	0.048	0.005	ND
Hexachlorobenzene	ug/g	1	0.005	ND
Lindane	ug/g	NA	0.003	ND
Methoxychlor	ug/g	6.5	0.01	ND
Total PCB	ug/g	3	0.05	ND
Aroclor 1242	ug/g	NV	0.05	ND
Aroclor 1248	ug/g	NV	0.05	ND
Aroclor 1254	ug/g	NV	0.05	ND
Aroclor 1260	ug/g	NV	0.05	ND

ND = Non-Detect
NV = No Value
RDL = Reportable Detection Limit
Soil, Groundwater and Sediment Standards for Use Under Part XV.1 Of the Environmental Protection Act as amended April 15, 2011
RPI O.Reg 153/04 Table 2 = Table 2: Potable Ground Water - Residential/Parkland/Institutional Property Use - Coarse-Grained Materials

Appendix D

Laboratory Certificates of Analysis

Your Project #: L09-301
Site Location: MARIANNEVILLE
Your C.O.C. #: 32174301, 321743-01-01

Attention: Andre Lyn
Cole Engineering Group Ltd
70 Valleywood Dr
Markham, ON
CANADA L3R 4T5

Report Date: 2012/02/21

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B219905
Received: 2012/02/10, 08:00

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Moisture	1	N/A	2012/02/17	CAM SOP-00445	R.Carter,1993
Moisture	3	N/A	2012/02/18	CAM SOP-00445	R.Carter,1993
OC Pesticides (Selected) & PCB (1)	3	2012/02/16	2012/02/17	CAM SOP-00307	SW846 8081, 8082
OC Pesticides (Selected) & PCB (1)	1	2012/02/17	2012/02/18	CAM SOP-00307	SW846 8081, 8082

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
OC Pesticides (Selected) & PCB (1)	1	2012/02/13	2012/02/14	CAM SOP-00307	SW846 8081,8082

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited by SCC (Lab ID 97) for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

../2

Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

JOLANTA GORALCZYK, Project Manager
Email: JGoralczyk@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 OC PESTICIDES (SOIL)

Maxxam ID		MM6584	MM6585		MM6586			MM6587		
Sampling Date		2012/02/09	2012/02/09		2012/02/09			2012/02/09		
	Units	**SS1**	**SS2**	**RDL**	**SS3**	**RDL**	**QC Batch**	**DUP1**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	39	40	1.0	38	1.0	2768473	29	1.0	2767722
Pesticides & Herbicides										
Hexachlorobutadiene	ug/g	ND	ND	0.050	ND	0.010	2766218	ND	0.0050	2767604
Hexachloroethane	ug/g	ND	ND	0.050	ND	0.010	2766218	ND	0.0050	2767604
Aldrin	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
a-Chlordane	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
g-Chlordane	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Chlordane (Total)	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
o,p-DDD	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
p,p-DDD	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
o,p-DDD + p,p-DDD	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
o,p-DDE	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
p,p-DDE	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
o,p-DDE + p,p-DDE	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
o,p-DDT	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
p,p-DDT	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
o,p-DDT + p,p-DDT	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Dieldrin	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Endosulfan I (alpha)	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Endosulfan II	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Total Endosulfan	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Endrin	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Heptachlor	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Heptachlor epoxide	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Hexachlorobenzene	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Lindane	ug/g	ND	ND	0.020	ND	0.0040	2766218	ND	0.0020	2767604
Methoxychlor	ug/g	ND	ND	0.050	ND	0.010	2766218	ND	0.0050	2767604
Total PCB	ug/g	ND	ND	0.30	ND	0.060	2766218	ND	0.030	2767604
Aroclor 1242	ug/g	ND	ND	0.15	ND	0.030	2766218	ND	0.015	2767604
Aroclor 1248	ug/g	ND	ND	0.15	ND	0.030	2766218	ND	0.015	2767604
Aroclor 1254	ug/g	ND	ND	0.15	ND	0.030	2766218	ND	0.015	2767604
Aroclor 1260	ug/g	ND	ND	0.15	ND	0.030	2766218	ND	0.015	2767604

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 OC PESTICIDES (SOIL)

Maxxam ID		MM6584	MM6585		MM6586			MM6587		
Sampling Date		2012/02/09	2012/02/09		2012/02/09			2012/02/09		
	Units	**SS1**	**SS2**	**RDL**	**SS3**	**RDL**	**QC Batch**	**DUP1**	**RDL**	**QC Batch**
Surrogate Recovery (%)										
2,4,5,6-Tetrachloro-m-xylene	%	108	108		88		2766218	83		2767604
Decachlorobiphenyl	%	79	92		83		2766218	67		2767604

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 OC PESTICIDES (WATER)

Maxxam ID		MM6588		
Sampling Date		2012/02/09		
	Units	**MW115**	**RDL**	**QC Batch**
Pesticides & Herbicides				
Hexachlorobutadiene	ug/L	ND	0.009	2762407
Hexachloroethane	ug/L	ND	0.01	2762407
Aldrin	ug/L	ND	0.005	2762407
a-Chlordane	ug/L	ND	0.005	2762407
g-Chlordane	ug/L	ND	0.005	2762407
Chlordane (Total)	ug/L	ND	0.005	2762407
o,p-DDD	ug/L	ND	0.005	2762407
p,p-DDD	ug/L	ND	0.005	2762407
o,p-DDD + p,p-DDD	ug/L	ND	0.005	2762407
o,p-DDE	ug/L	ND	0.005	2762407
p,p-DDE	ug/L	ND	0.005	2762407
o,p-DDE + p,p-DDE	ug/L	ND	0.005	2762407
o,p-DDT	ug/L	ND	0.005	2762407
p,p-DDT	ug/L	ND	0.005	2762407
o,p-DDT + p,p-DDT	ug/L	ND	0.005	2762407
Dieldrin	ug/L	ND	0.005	2762407
Endosulfan I (alpha)	ug/L	ND	0.005	2762407
Endosulfan II	ug/L	ND	0.005	2762407
Total Endosulfan	ug/L	ND	0.005	2762407
Endrin	ug/L	ND	0.005	2762407
Heptachlor	ug/L	ND	0.005	2762407
Heptachlor epoxide	ug/L	ND	0.005	2762407
Hexachlorobenzene	ug/L	ND	0.005	2762407
Lindane	ug/L	ND	0.003	2762407
Methoxychlor	ug/L	ND	0.01	2762407
Total PCB	ug/L	ND	0.05	2762407
Aroclor 1242	ug/L	ND	0.05	2762407
Aroclor 1248	ug/L	ND	0.05	2762407
Aroclor 1254	ug/L	ND	0.05	2762407
Aroclor 1260	ug/L	ND	0.05	2762407
Surrogate Recovery (%)				
2,4,5,6-Tetrachloro-m-xylene	%	68		2762407
Decachlorobiphenyl	%	84		2762407

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

Test Summary

Maxxam ID MM6584 **Collected** 2012/02/09
Sample ID SS1 **Shipped**
Matrix Soil **Received** 2012/02/10

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Moisture	BAL	2768473	N/A	2012/02/18	PHILIP MAST
OC Pesticides (Selected) & PCB	GC/ECD	2766218	2012/02/16	2012/02/17	MAHMUDUL KHAN

Maxxam ID MM6585 **Collected** 2012/02/09
Sample ID SS2 **Shipped**
Matrix Soil **Received** 2012/02/10

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Moisture	BAL	2768473	N/A	2012/02/18	PHILIP MAST
OC Pesticides (Selected) & PCB	GC/ECD	2766218	2012/02/16	2012/02/17	MAHMUDUL KHAN

Maxxam ID MM6586 **Collected** 2012/02/09
Sample ID SS3 **Shipped**
Matrix Soil **Received** 2012/02/10

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Moisture	BAL	2768473	N/A	2012/02/18	PHILIP MAST
OC Pesticides (Selected) & PCB	GC/ECD	2766218	2012/02/16	2012/02/17	MAHMUDUL KHAN

Maxxam ID MM6587 **Collected** 2012/02/09
Sample ID DUP1 **Shipped**
Matrix Soil **Received** 2012/02/10

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Moisture	BAL	2767722	N/A	2012/02/17	MIN YANG
OC Pesticides (Selected) & PCB	GC/ECD	2767604	2012/02/17	2012/02/18	DAWN ALARIE

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Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

Test Summary

Maxxam ID MM6588
Sample ID MW115
Matrix Water

Collected 2012/02/09
Shipped
Received 2012/02/10

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
OC Pesticides (Selected) & PCB	GC/ECD	2762407	2012/02/13	2012/02/14	DAWN ALARIE

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Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

GENERAL COMMENTS

OC Pesticide Analysis: Detection limits were adjusted for high moisture content.

Custody seal was present and intact.

Sample MM6584-01: OC Pesticide Analysis: Due to colour interferences, samples required dilution. Detection limits were adjusted accordingly.

Sample MM6585-01: OC Pesticide Analysis: Due to colour interferences, samples required dilution. Detection limits were adjusted accordingly.

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Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2762407	2,4,5,6-Tetrachloro-m-xylene	2012/02/14	58	50 - 130	60	50 - 130	74	%		
2762407	Decachlorobiphenyl	2012/02/14	85	50 - 130	78	50 - 130	88	%		
2762407	Hexachlorobutadiene	2012/02/14	56	50 - 130	51	50 - 130	ND, RDL=0.009	ug/L		
2762407	Hexachloroethane	2012/02/14	61	50 - 130	57	50 - 130	ND, RDL=0.01	ug/L		
2762407	Aldrin	2012/02/14	84	50 - 130	74	50 - 130	ND, RDL=0.005	ug/L		
2762407	a-Chlordane	2012/02/14	90	50 - 130	86	50 - 130	ND, RDL=0.005	ug/L		
2762407	g-Chlordane	2012/02/14	89	50 - 130	85	50 - 130	ND, RDL=0.005	ug/L		
2762407	o,p-DDD	2012/02/14	83	50 - 130	81	50 - 130	ND, RDL=0.005	ug/L		
2762407	p,p-DDD	2012/02/14	103	50 - 130	89	50 - 130	ND, RDL=0.005	ug/L		
2762407	o,p-DDE	2012/02/14	88	50 - 130	80	50 - 130	ND, RDL=0.005	ug/L		
2762407	p,p-DDE	2012/02/14	94	50 - 130	82	50 - 130	ND, RDL=0.005	ug/L		
2762407	o,p-DDT	2012/02/14	92	50 - 130	82	50 - 130	ND, RDL=0.005	ug/L		
2762407	p,p-DDT	2012/02/14	86	50 - 130	80	50 - 130	ND, RDL=0.005	ug/L	NC	30
2762407	Dieldrin	2012/02/14	119	50 - 130	89	50 - 130	ND, RDL=0.005	ug/L		
2762407	Endosulfan I (alpha)	2012/02/14	84	50 - 130	87	50 - 130	ND, RDL=0.005	ug/L		
2762407	Endosulfan II	2012/02/14	88	50 - 130	81	50 - 130	ND, RDL=0.005	ug/L		
2762407	Endrin	2012/02/14	116	50 - 130	87	50 - 130	ND, RDL=0.005	ug/L		
2762407	Heptachlor	2012/02/14	107	50 - 130	76	50 - 130	ND, RDL=0.005	ug/L		
2762407	Heptachlor epoxide	2012/02/14	102	50 - 130	85	50 - 130	ND, RDL=0.005	ug/L		
2762407	Hexachlorobenzene	2012/02/14	71	50 - 130	74	50 - 130	ND, RDL=0.005	ug/L		
2762407	Lindane	2012/02/14	82	50 - 130	81	50 - 130	ND, RDL=0.003	ug/L	NC	30
2762407	Methoxychlor	2012/02/14	91	50 - 130	82	50 - 130	ND, RDL=0.01	ug/L		
2762407	Total PCB	2012/02/14					ND, RDL=0.05	ug/L	NC	30
2762407	Aroclor 1242	2012/02/14					ND, RDL=0.05	ug/L	NC	30
2762407	Chlordane (Total)	2012/02/14					ND, RDL=0.005	ug/L		
2762407	o,p-DDD + p,p-DDD	2012/02/14					ND, RDL=0.005	ug/L		
2762407	o,p-DDE + p,p-DDE	2012/02/14					ND, RDL=0.005	ug/L		
2762407	o,p-DDT + p,p-DDT	2012/02/14					ND, RDL=0.005	ug/L		
2762407	Total Endosulfan	2012/02/14					ND, RDL=0.005	ug/L		
2762407	Aroclor 1248	2012/02/14					ND, RDL=0.05	ug/L		
2762407	Aroclor 1254	2012/02/14					ND, RDL=0.05	ug/L		
2762407	Aroclor 1260	2012/02/14					ND, RDL=0.05	ug/L		
2766218	2,4,5,6-Tetrachloro-m-xylene	2012/02/17	74	50 - 130	81	50 - 130	75	%		
2766218	Decachlorobiphenyl	2012/02/17	85	50 - 130	86	50 - 130	81	%		
2766218	Hexachlorobutadiene	2012/02/17	48(1, 2)	50 - 130	71	50 - 130	ND, RDL=0.0050	ug/g	NC	40
2766218	Hexachloroethane	2012/02/17	43	30 - 130	64	30 - 130	ND, RDL=0.0050	ug/g	NC	40
2766218	Aldrin	2012/02/17	91	50 - 130	93	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	a-Chlordane	2012/02/17	93	50 - 130	93	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	g-Chlordane	2012/02/17	88	50 - 130	91	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	o,p-DDD	2012/02/17	85	50 - 130	88	50 - 130	ND, RDL=0.0020	ug/g	NC	40

Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2766218	p,p-DDD	2012/02/17	102	30 - 130	103	30 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	o,p-DDE	2012/02/17	89	50 - 130	94	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	p,p-DDE	2012/02/17	92	50 - 130	99	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	o,p-DDT	2012/02/17	94	50 - 130	95	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	p,p-DDT	2012/02/17	89	50 - 130	100	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Dieldrin	2012/02/17	88	50 - 130	90	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Endosulfan I (alpha)	2012/02/17	79	50 - 130	82	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Endosulfan II	2012/02/17	84	50 - 130	85	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Endrin	2012/02/17	98	50 - 130	95	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Heptachlor	2012/02/17	94	50 - 130	93	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Heptachlor epoxide	2012/02/17	79	50 - 130	82	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Hexachlorobenzene	2012/02/17	73	50 - 130	76	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Lindane	2012/02/17	77	50 - 130	78	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2766218	Methoxychlor	2012/02/17	90	30 - 130	89	30 - 130	ND, RDL=0.0050	ug/g	NC	40
2766218	Total PCB	2012/02/17					ND, RDL=0.030	ug/g	NC	50
2766218	Aroclor 1242	2012/02/17					ND, RDL=0.015	ug/g	NC	40
2766218	Chlordane (Total)	2012/02/17					ND, RDL=0.0020	ug/g	NC	50
2766218	o,p-DDD + p,p-DDD	2012/02/17					ND, RDL=0.0020	ug/g	NC	50
2766218	o,p-DDE + p,p-DDE	2012/02/17					ND, RDL=0.0020	ug/g	NC	50
2766218	o,p-DDT + p,p-DDT	2012/02/17					ND, RDL=0.0020	ug/g	NC	50
2766218	Total Endosulfan	2012/02/17					ND, RDL=0.0020	ug/g	NC	50
2766218	Aroclor 1248	2012/02/17					ND, RDL=0.015	ug/g	NC	40
2766218	Aroclor 1254	2012/02/17					ND, RDL=0.015	ug/g	NC	40
2766218	Aroclor 1260	2012/02/17					ND, RDL=0.015	ug/g	NC	40
2767604	2,4,5,6-Tetrachloro-m-xylene	2012/02/18	110	50 - 130	86	50 - 130	82	%		
2767604	Decachlorobiphenyl	2012/02/18	112	50 - 130	86	50 - 130	89	%		
2767604	Hexachlorobutadiene	2012/02/18	60	50 - 130	71	50 - 130	ND, RDL=0.0050	ug/g	NC	40
2767604	Hexachloroethane	2012/02/18	46(3)	30 - 130	69	30 - 130	ND, RDL=0.0050	ug/g	NC	40
2767604	Aldrin	2012/02/18	121	50 - 130	100	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	a-Chlordane	2012/02/18	124	50 - 130	102	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	g-Chlordane	2012/02/18	120	50 - 130	92	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	o,p-DDD	2012/02/18	108	50 - 130	89	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	p,p-DDD	2012/02/18	115	30 - 130	98	30 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	o,p-DDE	2012/02/18	123	50 - 130	101	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	p,p-DDE	2012/02/18	124	50 - 130	100	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	o,p-DDT	2012/02/18	120	50 - 130	93	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	p,p-DDT	2012/02/18	121	50 - 130	98	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Dieldrin	2012/02/18	104	50 - 130	94	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Endosulfan I (alpha)	2012/02/18	97	50 - 130	87	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Endosulfan II	2012/02/18	91	50 - 130	83	50 - 130	ND, RDL=0.0020	ug/g	NC	40

Maxxam Job #: B219905
Report Date: 2012/02/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2767604	Endrin	2012/02/18	103	50 - 130	95	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Heptachlor	2012/02/18	122	50 - 130	98	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Heptachlor epoxide	2012/02/18	104	50 - 130	100	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Hexachlorobenzene	2012/02/18	110	50 - 130	85	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Lindane	2012/02/18	110	50 - 130	89	50 - 130	ND, RDL=0.0020	ug/g	NC	40
2767604	Methoxychlor	2012/02/18	96	30 - 130	86	30 - 130	ND, RDL=0.0050	ug/g	NC	40
2767604	Total PCB	2012/02/18					ND, RDL=0.030	ug/g	NC	50
2767604	Aroclor 1242	2012/02/18					ND, RDL=0.015	ug/g	NC	40
2767604	Chlordane (Total)	2012/02/18					ND, RDL=0.0020	ug/g	NC	50
2767604	o,p-DDD + p,p-DDD	2012/02/18					ND, RDL=0.0020	ug/g	NC	50
2767604	o,p-DDE + p,p-DDE	2012/02/18					ND, RDL=0.0020	ug/g	NC	50
2767604	o,p-DDT + p,p-DDT	2012/02/18					ND, RDL=0.0020	ug/g	NC	50
2767604	Total Endosulfan	2012/02/18					ND, RDL=0.0020	ug/g	NC	50
2767604	Aroclor 1248	2012/02/18					ND, RDL=0.015	ug/g	NC	40
2767604	Aroclor 1254	2012/02/18					ND, RDL=0.015	ug/g	NC	40
2767604	Aroclor 1260	2012/02/18					ND, RDL=0.015	ug/g	NC	40
2767722	Moisture	2012/02/17							1.0	20
2768473	Moisture	2012/02/18							NC	20

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) - The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.
(3) - The recovery for the flagged target analyte was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported for this specific analyte with spike recoveries within this range are still valid but may have an associated low bias.

Validation Signature Page

Maxxam Job #: B219905

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

CHARLES ANCKER, B.Sc., M.Sc., C.Chem, Senior Analyst

EWA PRANJIC, M.Sc., C.Chem, Scientific Specialist

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your Project #: L09-301
Your C.O.C. #: 63564

Attention: Andre Lyn
Cole Engineering Group Ltd
70 Valleywood Dr
Markham, ON
CANADA L3R 4T5

Report Date: 2012/02/24

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B223680
Received: 2012/02/17, 13:40

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
1,3-Dichloropropene Sum	2	2012/02/17	2012/02/24		EPA 8260
Petroleum Hydro. CCME F1 & BTEX in Water	2	N/A	2012/02/23	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water	1	2012/02/22	2012/02/22	CAM SOP-00316	CCME Hydrocarbons
Volatile Organic Compounds in Water	1	N/A	2012/02/23	CAM SOP 00226	EPA 8260 modified
Volatile Organic Compounds in Water	1	N/A	2012/02/24	CAM SOP 00226	EPA 8260 modified

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited by SCC (Lab ID 97) for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

../2

Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

JOLANTA GORALCZYK, Project Manager
Email: JGoralczyk@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

O'REG 153 PETROLEUM HYDROCARBONS (WATER)

Maxxam ID		MO3987	MO3987	MO3988		
Sampling Date		2012/02/17 09:15	2012/02/17 09:15			
	Units	**MW1D**	**MW1D Lab-Dup**	**TRIP BLANK**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons						
F1 (C6-C10)	ug/L	ND		ND	25	2771332
F1 (C6-C10) - BTEX	ug/L	ND		ND	25	2771332
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/L	ND	ND		100	2770091
F3 (C16-C34 Hydrocarbons)	ug/L	ND	ND		100	2770091
F4 (C34-C50 Hydrocarbons)	ug/L	ND	ND		100	2770091
Reached Baseline at C50	ug/L	YES	YES			2770091
Surrogate Recovery (%)						
1,4-Difluorobenzene	%	96		98		2771332
4-Bromofluorobenzene	%	88		90		2771332
D10-Ethylbenzene	%	95		95		2771332
D4-1,2-Dichloroethane	%	112		111		2771332
o-Terphenyl	%	108	103			2770091

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

O'REG 153 VOLATILE ORGANICS (WATER)

Maxxam ID		MO3987	MO3988		
Sampling Date		2012/02/17 09:15			
	Units	**MW1D**	**TRIP BLANK**	**RDL**	**QC Batch**
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	ND	ND	0.50	2767285
Volatile Organics					
Acetone (2-Propanone)	ug/L	ND	ND	10	2769075
Benzene	ug/L	ND	ND	0.20	2769075
Bromodichloromethane	ug/L	ND	ND	0.50	2769075
Bromoform	ug/L	ND	ND	1.0	2769075
Bromomethane	ug/L	ND	ND	0.50	2769075
Carbon Tetrachloride	ug/L	ND	ND	0.20	2769075
Chlorobenzene	ug/L	ND	ND	0.20	2769075
Chloroform	ug/L	ND	ND	0.20	2769075
Dibromochloromethane	ug/L	ND	ND	0.50	2769075
1,2-Dichlorobenzene	ug/L	ND	ND	0.50	2769075
1,3-Dichlorobenzene	ug/L	ND	ND	0.50	2769075
1,4-Dichlorobenzene	ug/L	ND	ND	0.50	2769075
Dichlorodifluoromethane (FREON 12)	ug/L	ND	ND	1.0	2769075
1,1-Dichloroethane	ug/L	ND	ND	0.20	2769075
1,2-Dichloroethane	ug/L	ND	ND	0.50	2769075
1,1-Dichloroethylene	ug/L	ND	ND	0.20	2769075
cis-1,2-Dichloroethylene	ug/L	ND	ND	0.50	2769075
trans-1,2-Dichloroethylene	ug/L	ND	ND	0.50	2769075
1,2-Dichloropropane	ug/L	ND	ND	0.20	2769075
cis-1,3-Dichloropropene	ug/L	ND	ND	0.30	2769075
trans-1,3-Dichloropropene	ug/L	ND	ND	0.40	2769075
Ethylbenzene	ug/L	ND	ND	0.20	2769075
Ethylene Dibromide	ug/L	ND	ND	0.20	2769075
Hexane	ug/L	ND	ND	1.0	2769075
Methylene Chloride(Dichloromethane)	ug/L	ND	ND	2.0	2769075
Methyl Isobutyl Ketone	ug/L	ND	ND	5.0	2769075
Methyl Ethyl Ketone (2-Butanone)	ug/L	ND	ND	10	2769075
Methyl t-butyl ether (MTBE)	ug/L	ND	ND	0.50	2769075
Styrene	ug/L	ND	ND	0.50	2769075
1,1,1,2-Tetrachloroethane	ug/L	ND	ND	0.50	2769075
1,1,2,2-Tetrachloroethane	ug/L	ND	ND	0.50	2769075
Tetrachloroethylene	ug/L	ND	ND	0.20	2769075

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

O'REG 153 VOLATILE ORGANICS (WATER)

Maxxam ID		MO3987	MO3988		
Sampling Date		2012/02/17 09:15			
	Units	**MW1D**	**TRIP BLANK**	**RDL**	**QC Batch**
Toluene	ug/L	ND	ND	0.20	2769075
1,1,1-Trichloroethane	ug/L	ND	ND	0.20	2769075
1,1,2-Trichloroethane	ug/L	ND	ND	0.50	2769075
Trichloroethylene	ug/L	ND	ND	0.20	2769075
Vinyl Chloride	ug/L	ND	ND	0.20	2769075
p+m-Xylene	ug/L	ND	ND	0.20	2769075
o-Xylene	ug/L	ND	ND	0.20	2769075
Xylene (Total)	ug/L	ND	ND	0.20	2769075
Trichlorofluoromethane (FREON 11)	ug/L	ND	ND	0.50	2769075
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	99	98		2769075
D4-1,2-Dichloroethane	%	103	100		2769075
D8-Toluene	%	98	99		2769075

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

Test Summary

Maxxam ID MO3987 **Collected** 2012/02/17
Sample ID MW1D **Shipped**
Matrix Water **Received** 2012/02/17

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2767285	2012/02/24	2012/02/24	AUTOMATED STATCHK
Petroleum Hydro. CCME F1 & BTEX in Wat	HSGC/MSFD	2771332	N/A	2012/02/23	SIMON XI
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	2770091	2012/02/22	2012/02/22	DORINA POPA
Volatile Organic Compounds in Water	P&T/MS	2769075	N/A	2012/02/24	FERESHTEH SHAFIEI

Maxxam ID MO3987 Dup **Collected** 2012/02/17
Sample ID MW1D **Shipped**
Matrix Water **Received** 2012/02/17

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	2770091	2012/02/22	2012/02/22	DORINA POPA

Maxxam ID MO3988 **Collected**
Sample ID TRIP BLANK **Shipped**
Matrix Water **Received** 2012/02/17

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2767285	2012/02/24	2012/02/24	AUTOMATED STATCHK
Petroleum Hydro. CCME F1 & BTEX in Wat	HSGC/MSFD	2771332	N/A	2012/02/23	SIMON XI
Volatile Organic Compounds in Water	P&T/MS	2769075	N/A	2012/02/23	FERESHTEH SHAFIEI

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Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

GENERAL COMMENTS

Custody seal was present and intact.

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Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2769075	4-Bromofluorobenzene	2012/02/23	100	70 - 130	100	70 - 130	100	%		
2769075	D4-1,2-Dichloroethane	2012/02/23	100	70 - 130	102	70 - 130	98	%		
2769075	D8-Toluene	2012/02/23	101	70 - 130	101	70 - 130	99	%		
2769075	Acetone (2-Propanone)	2012/02/24	77	60 - 140	85	60 - 140	ND, RDL=10	ug/L	NC	30
2769075	Benzene	2012/02/24	83	70 - 130	89	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Bromodichloromethane	2012/02/24	87	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	Bromoform	2012/02/24	96	70 - 130	109	70 - 130	ND, RDL=1.0	ug/L	NC	30
2769075	Bromomethane	2012/02/24	89	60 - 140	95	60 - 140	ND, RDL=0.50	ug/L	NC	30
2769075	Carbon Tetrachloride	2012/02/24	95	70 - 130	102	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Chlorobenzene	2012/02/24	86	70 - 130	93	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Chloroform	2012/02/24	95	70 - 130	102	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Dibromochloromethane	2012/02/24	92	70 - 130	103	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	1,2-Dichlorobenzene	2012/02/24	86	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	1,3-Dichlorobenzene	2012/02/24	84	70 - 130	92	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	1,4-Dichlorobenzene	2012/02/24	84	70 - 130	93	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	Dichlorodifluoromethane (FREON 12)	2012/02/24	100	60 - 140	104	60 - 140	ND, RDL=1.0	ug/L	NC	30
2769075	1,1-Dichloroethane	2012/02/24	85	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	1,2-Dichloroethane	2012/02/24	85	70 - 130	92	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	1,1-Dichloroethylene	2012/02/24	91	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	cis-1,2-Dichloroethylene	2012/02/24	86	70 - 130	93	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	trans-1,2-Dichloroethylene	2012/02/24	87	70 - 130	92	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	1,2-Dichloropropane	2012/02/24	84	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	cis-1,3-Dichloropropene	2012/02/24	76	70 - 130	83	70 - 130	ND, RDL=0.30	ug/L	NC	30
2769075	trans-1,3-Dichloropropene	2012/02/24	76	70 - 130	83	70 - 130	ND, RDL=0.40	ug/L	NC	30
2769075	Ethylbenzene	2012/02/24	82	70 - 130	90	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Ethylene Dibromide	2012/02/24	89	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Hexane	2012/02/24	91	70 - 130	97	70 - 130	ND, RDL=1.0	ug/L	NC	30
2769075	MethyleneChloride(Dichloromethane)	2012/02/24	85	70 - 130	91	70 - 130	ND, RDL=2.0	ug/L	NC	30
2769075	Methyl Isobutyl Ketone	2012/02/24	80	70 - 130	92	70 - 130	ND, RDL=5.0	ug/L	NC	30
2769075	Methyl Ethyl Ketone (2-Butanone)	2012/02/24	82	60 - 140	91	60 - 140	ND, RDL=10	ug/L	NC	30
2769075	Methyl t-butyl ether (MTBE)	2012/02/24	88	70 - 130	95	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	Styrene	2012/02/24	84	70 - 130	94	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	1,1,1,2-Tetrachloroethane	2012/02/24	93	70 - 130	103	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	1,1,2,2-Tetrachloroethane	2012/02/24	84	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	Tetrachloroethylene	2012/02/24	88	70 - 130	95	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Toluene	2012/02/24	85	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	1,1,1-Trichloroethane	2012/02/24	89	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	1,1,2-Trichloroethane	2012/02/24	87	70 - 130	97	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	Trichloroethylene	2012/02/24	86	70 - 130	92	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Vinyl Chloride	2012/02/24	88	70 - 130	93	70 - 130	ND, RDL=0.20	ug/L	NC	30

Maxxam Job #: B223680
Report Date: 2012/02/24

Cole Engineering Group Ltd
Client Project #: L09-301

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2769075	p+m-Xylene	2012/02/24	81	70 - 130	88	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	o-Xylene	2012/02/24	82	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L	NC	30
2769075	Trichlorofluoromethane (FREON 11)	2012/02/24	93	70 - 130	99	70 - 130	ND, RDL=0.50	ug/L	NC	30
2769075	Xylene (Total)	2012/02/24					ND, RDL=0.20	ug/L	NC	30
2770091	o-Terphenyl	2012/02/22	101	50 - 130	102	50 - 130	102	%		
2770091	F2 (C10-C16 Hydrocarbons)	2012/02/22	91	50 - 130	92	70 - 130	ND, RDL=100	ug/L	NC	30
2770091	F3 (C16-C34 Hydrocarbons)	2012/02/22	84	50 - 130	86	70 - 130	ND, RDL=100	ug/L	NC	30
2770091	F4 (C34-C50 Hydrocarbons)	2012/02/22	78	50 - 130	80	70 - 130	ND, RDL=100	ug/L	NC	30
2771332	1,4-Difluorobenzene	2012/02/23	98	70 - 130	96	70 - 130	95	%		
2771332	4-Bromofluorobenzene	2012/02/23	104	70 - 130	102	70 - 130	98	%		
2771332	D10-Ethylbenzene	2012/02/23	105	70 - 130	106	70 - 130	97	%		
2771332	D4-1,2-Dichloroethane	2012/02/23	113	70 - 130	111	70 - 130	114	%		
2771332	F1 (C6-C10)	2012/02/23	90	70 - 130	101	70 - 130	ND, RDL=25	ug/L	NC	30
2771332	F1 (C6-C10) - BTEX	2012/02/23					ND, RDL=25	ug/L	NC	30

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B223680

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

BRAD NEWMAN, Scientific Specialist

JEEVARAJ JEEVARATRNAM, Senior Analyst

SUZANA POPOVIC, Supervisor, Hydrocarbons

==========

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Your Project #: L09-301
Site Location: MARIANNEVILLE
Your C.O.C. #: 33001701, 330017-01-01

Attention: Andre Lyn
Cole Engineering Group Ltd
70 Valleywood Dr
Markham, ON
CANADA L3R 4T5

Report Date: 2012/03/21

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B237192
Received: 2012/03/15, 13:40

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
1,3-Dichloropropene Sum	3	2012/03/15	2012/03/20		EPA 8260
Petroleum Hydro. CCME F1 & BTEX in Soil	2	2012/03/16	2012/03/21	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	2	2012/03/20	2012/03/21	CAM SOP-00316	CCME CWS
Moisture	2	N/A	2012/03/19	CAM SOP-00445	R.Carter,1993
Volatile Organic Compounds in Soil	3	2012/03/16	2012/03/16	CAM SOP-00226	EPA 8260 modified

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
1,3-Dichloropropene Sum	3	2012/03/15	2012/03/21		EPA 8260
Petroleum Hydro. CCME F1 & BTEX in Water	2	N/A	2012/03/21	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water	2	2012/03/20	2012/03/20	CAM SOP-00316	CCME Hydrocarbons
Volatile Organic Compounds in Water	3	N/A	2012/03/20	CAM SOP 00226	EPA 8260 modified

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited by SCC (Lab ID 97) for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

../2

Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

JOLANTA GORALCZYK, Project Manager
Email: JGoralczyk@maxxam.ca
Phone# (905) 817-5700

==========

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Total cover pages: 2

Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		MV0136	MV0137		
Sampling Date		2012/03/14 10:15	2012/03/14 10:15		
	Units	**BH1-4**	**BH1-7**	**RDL**	**QC Batch**
Inorganics					
Moisture	%	17	23	1.0	2793426
BTEX & F1 Hydrocarbons					
F1 (C6-C10)	ug/g	ND	ND	10	2794165
F1 (C6-C10) - BTEX	ug/g	ND	ND	10	2794165
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/g	ND	ND	10	2795096
F3 (C16-C34 Hydrocarbons)	ug/g	ND	ND	10	2795096
F4 (C34-C50 Hydrocarbons)	ug/g	ND	ND	10	2795096
Reached Baseline at C50	ug/g	YES	YES		2795096
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	97	97		2794165
4-Bromofluorobenzene	%	108	107		2794165
D10-Ethylbenzene	%	89	91		2794165
D4-1,2-Dichloroethane	%	97	96		2794165
o-Terphenyl	%	97	96		2795096

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 VOLATILE ORGANICS (SOIL)

Maxxam ID		MV0136	MV0137	MV0140		
Sampling Date		2012/03/14 10:15	2012/03/14 10:15	2012/03/14		
	Units	**BH1-4**	**BH1-7**	**TRIP BLANK**	**RDL**	**QC Batch**
Calculated Parameters						
1,3-Dichloropropene (cis+trans)	ug/g	ND	ND	ND	0.050	2790491
Volatile Organics						
Acetone (2-Propanone)	ug/g	ND	ND	ND	0.50	2791620
Benzene	ug/g	ND	ND	ND	0.020	2791620
Bromodichloromethane	ug/g	ND	ND	ND	0.050	2791620
Bromoform	ug/g	ND	ND	ND	0.050	2791620
Bromomethane	ug/g	ND	ND	ND	0.050	2791620
Carbon Tetrachloride	ug/g	ND	ND	ND	0.050	2791620
Chlorobenzene	ug/g	ND	ND	ND	0.050	2791620
Chloroform	ug/g	ND	ND	ND	0.050	2791620
Dibromochloromethane	ug/g	ND	ND	ND	0.050	2791620
1,2-Dichlorobenzene	ug/g	ND	ND	ND	0.050	2791620
1,3-Dichlorobenzene	ug/g	ND	ND	ND	0.050	2791620
1,4-Dichlorobenzene	ug/g	ND	ND	ND	0.050	2791620
Dichlorodifluoromethane (FREON 12)	ug/g	ND	ND	ND	0.050	2791620
1,1-Dichloroethane	ug/g	ND	ND	ND	0.050	2791620
1,2-Dichloroethane	ug/g	ND	ND	ND	0.050	2791620
1,1-Dichloroethylene	ug/g	ND	ND	ND	0.050	2791620
cis-1,2-Dichloroethylene	ug/g	ND	ND	ND	0.050	2791620
trans-1,2-Dichloroethylene	ug/g	ND	ND	ND	0.050	2791620
1,2-Dichloropropane	ug/g	ND	ND	ND	0.050	2791620
cis-1,3-Dichloropropene	ug/g	ND	ND	ND	0.030	2791620
trans-1,3-Dichloropropene	ug/g	ND	ND	ND	0.040	2791620
Ethylbenzene	ug/g	ND	ND	ND	0.020	2791620
Ethylene Dibromide	ug/g	ND	ND	ND	0.050	2791620
Hexane	ug/g	ND	ND	ND	0.050	2791620
Methylene Chloride(Dichloromethane)	ug/g	ND	ND	ND	0.050	2791620
Methyl Isobutyl Ketone	ug/g	ND	ND	ND	0.50	2791620
Methyl Ethyl Ketone (2-Butanone)	ug/g	ND	ND	ND	0.50	2791620
Methyl t-butyl ether (MTBE)	ug/g	ND	ND	ND	0.050	2791620
Styrene	ug/g	ND	ND	ND	0.050	2791620
1,1,1,2-Tetrachloroethane	ug/g	ND	ND	ND	0.050	2791620
1,1,2,2-Tetrachloroethane	ug/g	ND	ND	ND	0.050	2791620
Tetrachloroethylene	ug/g	ND	ND	ND	0.050	2791620

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 VOLATILE ORGANICS (SOIL)

Maxxam ID		MV0136	MV0137	MV0140		
Sampling Date		2012/03/14 10:15	2012/03/14 10:15	2012/03/14		
	Units	**BH1-4**	**BH1-7**	**TRIP BLANK**	**RDL**	**QC Batch**
Toluene	ug/g	ND	ND	ND	0.020	2791620
1,1,1-Trichloroethane	ug/g	ND	ND	ND	0.050	2791620
1,1,2-Trichloroethane	ug/g	ND	ND	ND	0.050	2791620
Trichloroethylene	ug/g	ND	ND	ND	0.050	2791620
Vinyl Chloride	ug/g	ND	ND	ND	0.020	2791620
p+m-Xylene	ug/g	ND	ND	ND	0.020	2791620
o-Xylene	ug/g	ND	ND	ND	0.020	2791620
Xylene (Total)	ug/g	ND	ND	ND	0.020	2791620
Trichlorofluoromethane (FREON 11)	ug/g	ND	ND	ND	0.050	2791620
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	102	101	101		2791620
D10-o-Xylene	%	115	108	107		2791620
D4-1,2-Dichloroethane	%	89	91	92		2791620
D8-Toluene	%	94	95	96		2791620

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 PETROLEUM HYDROCARBONS (WATER)

Maxxam ID		MV0138	MV0139		
Sampling Date		2012/03/14 11:00	2012/03/14 11:00		
	Units	**MW1-S**	**DUP**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons					
F1 (C6-C10)	ug/L	ND	ND	25	2794222
F1 (C6-C10) - BTEX	ug/L	ND	ND	25	2794222
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/L	ND	ND	100	2794022
F3 (C16-C34 Hydrocarbons)	ug/L	ND	ND	100	2794022
F4 (C34-C50 Hydrocarbons)	ug/L	ND	ND	100	2794022
Reached Baseline at C50	ug/L	YES	YES		2794022
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	97	101		2794222
4-Bromofluorobenzene	%	99	103		2794222
D10-Ethylbenzene	%	99	95		2794222
D4-1,2-Dichloroethane	%	103	104		2794222
o-Terphenyl	%	88	87		2794022

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 VOLATILE ORGANICS (WATER)

Maxxam ID		MV0138	MV0139	MV0141		
Sampling Date		2012/03/14 11:00	2012/03/14 11:00	2012/03/01		
	Units	**MW1-S**	**DUP**	**TRIP BLANK LOT #3162**	**RDL**	**QC Batch**
Calculated Parameters						
1,3-Dichloropropene (cis+trans)	ug/L	ND	ND	ND	0.50	2790346
Volatile Organics						
Acetone (2-Propanone)	ug/L	ND	ND	ND	10	2790877
Benzene	ug/L	ND	ND	ND	0.20	2790877
Bromodichloromethane	ug/L	ND	ND	ND	0.50	2790877
Bromoform	ug/L	ND	ND	ND	1.0	2790877
Bromomethane	ug/L	ND	ND	ND	0.50	2790877
Carbon Tetrachloride	ug/L	ND	ND	ND	0.20	2790877
Chlorobenzene	ug/L	ND	ND	ND	0.20	2790877
Chloroform	ug/L	ND	ND	ND	0.20	2790877
Dibromochloromethane	ug/L	ND	ND	ND	0.50	2790877
1,2-Dichlorobenzene	ug/L	ND	ND	ND	0.50	2790877
1,3-Dichlorobenzene	ug/L	ND	ND	ND	0.50	2790877
1,4-Dichlorobenzene	ug/L	ND	ND	ND	0.50	2790877
Dichlorodifluoromethane (FREON 12)	ug/L	ND	ND	ND	1.0	2790877
1,1-Dichloroethane	ug/L	ND	ND	ND	0.20	2790877
1,2-Dichloroethane	ug/L	ND	ND	ND	0.50	2790877
1,1-Dichloroethylene	ug/L	ND	ND	ND	0.20	2790877
cis-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.50	2790877
trans-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.50	2790877
1,2-Dichloropropane	ug/L	ND	ND	ND	0.20	2790877
cis-1,3-Dichloropropene	ug/L	ND	ND	ND	0.30	2790877
trans-1,3-Dichloropropene	ug/L	ND	ND	ND	0.40	2790877
Ethylbenzene	ug/L	ND	ND	ND	0.20	2790877
Ethylene Dibromide	ug/L	ND	ND	ND	0.20	2790877
Hexane	ug/L	ND	ND	ND	1.0	2790877
Methylene Chloride(Dichloromethane)	ug/L	ND	ND	ND	2.0	2790877
Methyl Isobutyl Ketone	ug/L	ND	ND	ND	5.0	2790877
Methyl Ethyl Ketone (2-Butanone)	ug/L	ND	ND	ND	10	2790877
Methyl t-butyl ether (MTBE)	ug/L	ND	ND	ND	0.50	2790877
Styrene	ug/L	ND	ND	ND	0.50	2790877
1,1,1,2-Tetrachloroethane	ug/L	ND	ND	ND	0.50	2790877
1,1,2,2-Tetrachloroethane	ug/L	ND	ND	ND	0.50	2790877
Tetrachloroethylene	ug/L	ND	ND	ND	0.20	2790877

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

O'REG 153 VOLATILE ORGANICS (WATER)

Maxxam ID		MV0138	MV0139	MV0141		
Sampling Date		2012/03/14 11:00	2012/03/14 11:00	2012/03/01		
	Units	**MW1-S**	**DUP**	**TRIP BLANK LOT #3162**	**RDL**	**QC Batch**
Toluene	ug/L	ND	0.22	ND	0.20	2790877
1,1,1-Trichloroethane	ug/L	ND	ND	ND	0.20	2790877
1,1,2-Trichloroethane	ug/L	ND	ND	ND	0.50	2790877
Trichloroethylene	ug/L	ND	ND	ND	0.20	2790877
Vinyl Chloride	ug/L	ND	ND	ND	0.20	2790877
p+m-Xylene	ug/L	ND	ND	ND	0.20	2790877
o-Xylene	ug/L	ND	ND	ND	0.20	2790877
Xylene (Total)	ug/L	ND	ND	ND	0.20	2790877
Trichlorofluoromethane (FREON 11)	ug/L	ND	ND	ND	0.50	2790877
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	96	96	96		2790877
D4-1,2-Dichloroethane	%	110	108	107		2790877
D8-Toluene	%	95	96	95		2790877

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

Test Summary

Maxxam ID MV0136 **Collected** 2012/03/14
Sample ID BH1-4 **Shipped**
Matrix Soil **Received** 2012/03/15

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2790491	2012/03/20	2012/03/20	AUTOMATED STATCHK
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	2794165	2012/03/16	2012/03/21	LINCOLN RAMDAHIN
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	2795096	2012/03/20	2012/03/21	BILJANA LAZOVIC
Moisture	BAL	2793426	N/A	2012/03/19	CHAMIKA DEEYAGAHA
Volatile Organic Compounds in Soil	GC/MS	2791620	2012/03/16	2012/03/16	JAMES ZOU

Maxxam ID MV0137 **Collected** 2012/03/14
Sample ID BH1-7 **Shipped**
Matrix Soil **Received** 2012/03/15

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2790491	2012/03/20	2012/03/20	AUTOMATED STATCHK
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	2794165	2012/03/16	2012/03/21	LINCOLN RAMDAHIN
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	2795096	2012/03/20	2012/03/21	BILJANA LAZOVIC
Moisture	BAL	2793426	N/A	2012/03/19	CHAMIKA DEEYAGAHA
Volatile Organic Compounds in Soil	GC/MS	2791620	2012/03/16	2012/03/16	JAMES ZOU

Maxxam ID MV0138 **Collected** 2012/03/14
Sample ID MW1-S **Shipped**
Matrix Water **Received** 2012/03/15

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2790346	2012/03/21	2012/03/21	AUTOMATED STATCHK
Petroleum Hydro. CCME F1 & BTEX in Wat	HSGC/MSFD	2794222	N/A	2012/03/21	ABDI MOHAMUD
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	2794022	2012/03/20	2012/03/20	JOLANTA KAWZOWICZ
Volatile Organic Compounds in Water	GC/MS	2790877	N/A	2012/03/20	ADRIANA ZURITA

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Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

Test Summary

Maxxam ID MV0139 **Collected** 2012/03/14
Sample ID DUP **Shipped**
Matrix Water **Received** 2012/03/15

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2790346	2012/03/21	2012/03/21	AUTOMATED STATCHK
Petroleum Hydro. CCME F1 & BTEX in Wat	HSGC/MSFD	2794222	N/A	2012/03/21	ABDI MOHAMUD
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	2794022	2012/03/20	2012/03/20	JOLANTA KAWZOWICZ
Volatile Organic Compounds in Water	GC/MS	2790877	N/A	2012/03/20	ADRIANA ZURITA

Maxxam ID MV0140 **Collected** 2012/03/14
Sample ID TRIP BLANK **Shipped**
Matrix Soil **Received** 2012/03/15

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2790491	2012/03/20	2012/03/20	AUTOMATED STATCHK
Volatile Organic Compounds in Soil	GC/MS	2791620	2012/03/16	2012/03/16	JAMES ZOU

Maxxam ID MV0141 **Collected** 2012/03/01
Sample ID TRIP BLANK LOT #3162 **Shipped**
Matrix Water **Received** 2012/03/15

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	2790346	2012/03/21	2012/03/21	AUTOMATED STATCHK
Volatile Organic Compounds in Water	GC/MS	2790877	N/A	2012/03/20	ADRIANA ZURITA

Maxxam Job #: B237192
Report Date: 2012/03/21

Cole Engineering Group Ltd
Client Project #: L09-301
Site Location: MARIANNEVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2790877	4-Bromofluorobenzene	2012/03/20	101	70 - 130	101	70 - 130	98	%		
2790877	D4-1,2-Dichloroethane	2012/03/20	106	70 - 130	106	70 - 130	108	%		
2790877	D8-Toluene	2012/03/20	100	70 - 130	101	70 - 130	96	%		
2790877	Acetone (2-Propanone)	2012/03/20	93	60 - 140	83	60 - 140	ND, RDL=10	ug/L	NC	30
2790877	Benzene	2012/03/20	92	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Bromodichloromethane	2012/03/20	102	70 - 130	100	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	Bromoform	2012/03/20	102	70 - 130	99	70 - 130	ND, RDL=1.0	ug/L	NC	30
2790877	Bromomethane	2012/03/20	102	60 - 140	103	60 - 140	ND, RDL=0.50	ug/L	NC	30
2790877	Carbon Tetrachloride	2012/03/20	104	70 - 130	104	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Chlorobenzene	2012/03/20	96	70 - 130	94	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Chloroform	2012/03/20	110	70 - 130	109	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Dibromochloromethane	2012/03/20	98	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	1,2-Dichlorobenzene	2012/03/20	95	70 - 130	95	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	1,3-Dichlorobenzene	2012/03/20	93	70 - 130	93	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	1,4-Dichlorobenzene	2012/03/20	94	70 - 130	94	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	Dichlorodifluoromethane (FREON 12)	2012/03/20	125	60 - 140	124	60 - 140	ND, RDL=1.0	ug/L	NC	30
2790877	1,1-Dichloroethane	2012/03/20	98	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	1,2-Dichloroethane	2012/03/20	102	70 - 130	99	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	1,1-Dichloroethylene	2012/03/20	104	70 - 130	104	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	cis-1,2-Dichloroethylene	2012/03/20	100	70 - 130	98	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	trans-1,2-Dichloroethylene	2012/03/20	104	70 - 130	104	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	1,2-Dichloropropane	2012/03/20	98	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	cis-1,3-Dichloropropene	2012/03/20	97	70 - 130	96	70 - 130	ND, RDL=0.30	ug/L	NC	30
2790877	trans-1,3-Dichloropropene	2012/03/20	92	70 - 130	92	70 - 130	ND, RDL=0.40	ug/L	NC	30
2790877	Ethylbenzene	2012/03/20	91	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Ethylene Dibromide	2012/03/20	98	70 - 130	94	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Hexane	2012/03/20	104	70 - 130	104	70 - 130	ND, RDL=1.0	ug/L	NC	30
2790877	MethyleneChloride(Dichloromethane)	2012/03/20	115	70 - 130	113	70 - 130	ND, RDL=2.0	ug/L	NC	30
2790877	Methyl Isobutyl Ketone	2012/03/20	101	70 - 130	97	70 - 130	ND, RDL=5.0	ug/L	NC	30
2790877	Methyl Ethyl Ketone (2-Butanone)	2012/03/20	101	60 - 140	93	60 - 140	ND, RDL=10	ug/L	NC	30
2790877	Methyl t-butyl ether (MTBE)	2012/03/20	102	70 - 130	100	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	Styrene	2012/03/20	95	70 - 130	97	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	1,1,1,2-Tetrachloroethane	2012/03/20	98	70 - 130	97	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	1,1,2,2-Tetrachloroethane	2012/03/20	98	70 - 130	95	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	Tetrachloroethylene	2012/03/20	93	70 - 130	93	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Toluene	2012/03/20	93	70 - 130	93	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	1,1,1-Trichloroethane	2012/03/20	100	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	1,1,2-Trichloroethane	2012/03/20	94	70 - 130	91	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	Trichloroethylene	2012/03/20	97	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Vinyl Chloride	2012/03/20	100	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC	30

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Site Location: MARIANNEVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2790877	p+m-Xylene	2012/03/20	90	70 - 130	90	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	o-Xylene	2012/03/20	90	70 - 130	92	70 - 130	ND, RDL=0.20	ug/L	NC	30
2790877	Trichlorofluoromethane (FREON 11)	2012/03/20	104	70 - 130	104	70 - 130	ND, RDL=0.50	ug/L	NC	30
2790877	Xylene (Total)	2012/03/20					ND, RDL=0.20	ug/L	NC	30
2791620	4-Bromofluorobenzene	2012/03/16	102	60 - 140	103	60 - 140	102	%		
2791620	D10-o-Xylene	2012/03/16	107	60 - 130	101	60 - 130	104	%		
2791620	D4-1,2-Dichloroethane	2012/03/16	91	60 - 140	97	60 - 140	97	%		
2791620	D8-Toluene	2012/03/16	98	60 - 140	95	60 - 140	91	%		
2791620	Acetone (2-Propanone)	2012/03/16	69	60 - 140	73	60 - 140	ND, RDL=0.50	ug/g	NC	50
2791620	Benzene	2012/03/16	92	60 - 140	92	60 - 130	ND, RDL=0.020	ug/g	NC	50
2791620	Bromodichloromethane	2012/03/16	87	60 - 140	90	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Bromoform	2012/03/16	89	60 - 140	98	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Bromomethane	2012/03/16	98	60 - 140	99	60 - 140	ND, RDL=0.050	ug/g	NC	50
2791620	Carbon Tetrachloride	2012/03/16	100	60 - 140	97	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Chlorobenzene	2012/03/16	95	60 - 140	96	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Chloroform	2012/03/16	110	60 - 140	111	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Dibromochloromethane	2012/03/16	90	60 - 140	95	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,2-Dichlorobenzene	2012/03/16	93	60 - 140	95	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,3-Dichlorobenzene	2012/03/16	94	60 - 140	93	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,4-Dichlorobenzene	2012/03/16	94	60 - 140	94	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Dichlorodifluoromethane (FREON 12)	2012/03/16	107	60 - 140	103	60 - 140	ND, RDL=0.050	ug/g	NC	50
2791620	1,1-Dichloroethane	2012/03/16	90	60 - 140	90	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,2-Dichloroethane	2012/03/16	88	60 - 140	94	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,1-Dichloroethylene	2012/03/16	96	60 - 140	94	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	cis-1,2-Dichloroethylene	2012/03/16	89	60 - 140	91	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	trans-1,2-Dichloroethylene	2012/03/16	92	60 - 140	91	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,2-Dichloropropane	2012/03/16	87	60 - 140	89	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	cis-1,3-Dichloropropene	2012/03/16	79	60 - 140	82	60 - 130	ND, RDL=0.030	ug/g	NC	50
2791620	trans-1,3-Dichloropropene	2012/03/16	74	60 - 140	76	60 - 130	ND, RDL=0.040	ug/g	NC	50
2791620	Ethylbenzene	2012/03/16	90	60 - 140	88	60 - 130	ND, RDL=0.020	ug/g	NC	50
2791620	Ethylene Dibromide	2012/03/16	91	60 - 140	98	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Hexane	2012/03/16	96	60 - 140	93	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	MethyleneChloride(Dichloromethane)	2012/03/16	90	60 - 140	93	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Methyl Isobutyl Ketone	2012/03/16	67	60 - 140	78	60 - 130	ND, RDL=0.50	ug/g	NC	50
2791620	Methyl Ethyl Ketone (2-Butanone)	2012/03/16	70	60 - 140	78	60 - 140	ND, RDL=0.50	ug/g	NC	50
2791620	Methyl t-butyl ether (MTBE)	2012/03/16	93	60 - 140	94	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Styrene	2012/03/16	89	60 - 140	89	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,1,1,2-Tetrachloroethane	2012/03/16	95	60 - 140	96	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,1,2,2-Tetrachloroethane	2012/03/16	79	60 - 140	90	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Tetrachloroethylene	2012/03/16	103	60 - 140	100	60 - 130	ND, RDL=0.050	ug/g	NC	50

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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2791620	Toluene	2012/03/16	95	60 - 140	93	60 - 130	ND, RDL=0.020	ug/g	NC	50
2791620	1,1,1-Trichloroethane	2012/03/16	95	60 - 140	93	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	1,1,2-Trichloroethane	2012/03/16	92	60 - 140	98	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Trichloroethylene	2012/03/16	99	60 - 140	98	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Vinyl Chloride	2012/03/16	91	60 - 140	89	60 - 130	ND, RDL=0.020	ug/g	NC	50
2791620	p+m-Xylene	2012/03/16	91	60 - 140	90	60 - 130	ND, RDL=0.020	ug/g	NC	50
2791620	o-Xylene	2012/03/16	90	60 - 140	88	60 - 130	ND, RDL=0.020	ug/g	NC	50
2791620	Trichlorofluoromethane (FREON 11)	2012/03/16	103	60 - 140	99	60 - 130	ND, RDL=0.050	ug/g	NC	50
2791620	Xylene (Total)	2012/03/16					ND, RDL=0.020	ug/g	NC	50
2793426	Moisture	2012/03/19							NC	20
2794022	o-Terphenyl	2012/03/20	89	50 - 130	104	50 - 130	106	%		
2794022	F2 (C10-C16 Hydrocarbons)	2012/03/20	77	50 - 130	87	70 - 130	ND, RDL=100	ug/L	NC	30
2794022	F3 (C16-C34 Hydrocarbons)	2012/03/20	77	50 - 130	94	70 - 130	ND, RDL=100	ug/L	NC	30
2794022	F4 (C34-C50 Hydrocarbons)	2012/03/20	76	50 - 130	96	70 - 130	ND, RDL=100	ug/L	NC	30
2794165	1,4-Difluorobenzene	2012/03/21	98	60 - 140	97	60 - 140	98	%		
2794165	4-Bromofluorobenzene	2012/03/21	112	60 - 140	110	60 - 140	109	%		
2794165	D10-Ethylbenzene	2012/03/21	89	60 - 140	87	60 - 140	86	%		
2794165	D4-1,2-Dichloroethane	2012/03/21	95	60 - 140	96	60 - 140	96	%		
2794165	F1 (C6-C10)	2012/03/21	93	60 - 140	101	60 - 140	ND, RDL=10	ug/g	NC	50
2794165	F1 (C6-C10) - BTEX	2012/03/21					ND, RDL=10	ug/g	NC	50
2794222	1,4-Difluorobenzene	2012/03/20	98	70 - 130	99	70 - 130	100	%		
2794222	4-Bromofluorobenzene	2012/03/20	106	70 - 130	110	70 - 130	103	%		
2794222	D10-Ethylbenzene	2012/03/20	96	70 - 130	99	70 - 130	101	%		
2794222	D4-1,2-Dichloroethane	2012/03/20	103	70 - 130	101	70 - 130	103	%		
2794222	F1 (C6-C10)	2012/03/20	99	70 - 130	94	70 - 130	ND, RDL=25	ug/L		
2794222	F1 (C6-C10) - BTEX	2012/03/20					ND, RDL=25	ug/L		
2795096	o-Terphenyl	2012/03/21	91	50 - 130	92	50 - 130	99	%		
2795096	F2 (C10-C16 Hydrocarbons)	2012/03/21	107	50 - 130	102	70 - 130	ND, RDL=10	ug/g	NC	30
2795096	F3 (C16-C34 Hydrocarbons)	2012/03/21	107	50 - 130	103	70 - 130	ND, RDL=10	ug/g	NC	30
2795096	F4 (C34-C50 Hydrocarbons)	2012/03/21	97	50 - 130	93	70 - 130	ND, RDL=10	ug/g	NC	30

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

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The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

EWA PRANJIC, M.Sc., C.Chem, Scientific Specialist

MEDHAT RISKALLAH, Manager, Hydrocarbon Department

SUZANA POPOVIC, Supervisor, Hydrocarbons

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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