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March 15, 2017
Revised April 11, 2017

Wilson Associates
Consulting Hydrogeologists

South Saugeen Developments Ltd.
1021 Walton Avenue North
Listowel, ON
N4W 3S2

Attention: John Padfield and Aline Padfield

Re: Ministry of the Environment and Climate Change Guideline D-4 Assessment
Proposed South Saugeen Developments Ltd. Property
Cork Street and Martin Street, Community of Mount Forest
Township of Wellington North, County of Wellington

It is proposed to develop the ±10.6ha parcel of vacant land located generally west of Cork Street and north of Martin Street in Mount Forest as a residential subdivision. The attached sketch shows the layout of the subject site, and Figure 1 is an Ontario Base Map showing the location of the site and surroundings.

The proposed development will be serviced by the existing Mount Forest municipal water and sewage systems.

Due to the location of the closed Martin Street Landfill (the Landfill) to the south of the proposed development lands, a Ministry of the Environment and Climate Change (MOECC) Guideline D-4 Study was conducted to determine potential impacts of the Landfill on the proposed development lands. A D-4 study based upon readily available background information, observations gathered during several site visits, a subsurface investigation involving the installation, observation and sampling of monitoring wells, and the monitoring of subsurface gases in several gas probes was conducted in July 2016, January 2017 and February 2017. Supplementary information provided by the County of Wellington in an email dated March 24, 2017 and in a telephone discussion March 27, 2017 have been incorporated in this revised report. This report provides a summary of the study results.

It is understood that there are no records of monitoring wells, gas probes or historical monitoring events at the Landfill. It is also understood that remediation of the Landfill occurred *ca.* 2006 through the collection of outlying waste areas into a waste mound and covering the mound with a vegetated soil cap. The County reports that there were no indications of residual waste in the vicinity of the northern boundary of the Landfill property. The Landfill property is also understood to have contained a sewage sludge pond.

SITE SETTING, GEOLOGY AND HYDROGEOLOGY

The proposed development is situated within a ±10.6ha vacant parcel of land located west of Cork Street and north of Martin Street, within the southwesterly periphery of the Community of Mount Forest. The subject lands are currently mainly in active agricultural use, with some

wooded areas in the west, southeast and northeast. Lands to the east of the site are occupied by residential lots or open space. Lands to the west are undeveloped forest with some agriculture. Lands to the north are utilized as recreational land, with an arena and several sports fields. Lands to the south are occupied by the closed Landfill, the Mount Forest waste water treatment plant, and forested areas along side the River.

The site exhibits a rolling topography with an overall shallow slope to the west or south towards the South Saugeen River, with a total relief in the range of about 4m. A localized shallow depression is situated in the north-central portion of the property, where surface water accumulates during wet seasons. The South Saugeen River is located about 100m south of the site at its closest approach, and flows generally southwesterly through the area before turning northwestwards to the west of Mount Forest. A small southward-flowing tributary of the South Saugeen River is situated within the eastern portion of the site, and is incised about 1 to 2m below the surrounding lands. A second tributary of the South Saugeen River flows southwards beyond the western property line, and turns northwesterly nearby the southwestern corner of the site.

The property containing the Landfill is situated immediately south of the subject lands, on the south side of Martin Street. The Landfill waste deposit is located approximately 60 to 70m south of the southern property line of the subject lands, and based on aerial imagery provided by the Wellington County website, the Landfill occupies a site approximately 1.5ha in area.

The subject site is located within the Dundalk Till Plain physiographic region of southern Ontario. According to the Ontario Geological Survey Map 2383 "Quaternary Geology of the Palmerston Area", the upper soils in the vicinity of the subject site consist of glaciofluvial outwash deposits of gravel or gravelly sand likely underlain by Elma Till, a stony sandy silt to silt glacial till.

According to historical local well records, the overburden in the vicinity of the site is in the range of 40m deep, and is reported to consist mainly of fine-grained deposits. Isolated, discontinuous granular deposits are reported in shallow geotechnical well records at various depths in the upper overburden in the vicinity.

The bedrock beneath the site consists of dolostone with some shale, gypsum or salt of the Salina Formation, and is underlain by dolostone of the Guelph and Amabel formations.

The bedrock is regionally the most commonly utilized aquifer for potable groundwater supplies due to the mainly fine-grained character of the overburden. Some shallow dug or bored wells may be present in the area, where upper aquifer granular deposits are of sufficient depth.

SUBSURFACE INVESTIGATION

Due to the reported absence of subsurface information at and in the vicinity of the Landfill site, to provide information regarding subsurface conditions near the Landfill and on lands within the southern portion of the subject site closest to the Landfill, on July 21, 2016 nine boreholes were completed at six locations on and between the subject lands and the Landfill. The boreholes were completed using a track-mounted power auger machine equipped with continuous flight augers and conventional soil sampling equipment operated by London Soil Test Ltd. Complete logs of the nine boreholes are attached, and the locations are shown on Figure 1.

Water Levels:

Three of the nine boreholes were equipped as monitoring wells (MW1, MW2 and MW3), each with a 1.5m length of #10-slot PVC well screen set to below the observed watertable surface in the open boreholes on July 21, 2016 (watertable at 2.4m in MW1, 4.5m in MW2 and 1.5m at MW3). The following provides a summary of water level observations in the three monitoring wells, as observed January 24, 2017 and February 21, 2017.

	MW1	MW2	MW3
Ground Elevation*	409.24	410.30	409.23
Top of Casing Elevation*	410.00	411.21	410.17
January 24, 2017 Water Level (m below grade)	1.80	5.06	+0.04
January 24, 2017 Water Level Elevation*	408.20	405.24	409.27
February 21, 2017 Water Level (m below grade)	1.49	3.81	0.12
February 21, 2017 Water Level Elevation*	407.75	406.49	409.11

Note: * Elevation relative to assumed benchmark (410m) at top of casing of MW1.

The contours of the watertable surface and the inferred direction of shallow groundwater flow, as derived from the water levels observed in MW1, MW2 and MW3 on February 21, 2017, are shown on Figure 1. The inferred direction of shallow groundwater flow is southwesterly, gradually turning slightly southwards, which generally parallels the direction of local surface water flow and surface drainage.

Groundwater Quality:

On January 24, 2017, each of the three monitoring wells were developed by fully purging of all standing water using disposable bailers, and then allowing the water level to recover. Following purging, samples of groundwater were collected from each monitoring well into laboratory-supplied bottles, stored in an ice-packed cooler and submitted to Maxxam Analytics Inc. under chain-of-custody for an analysis of general chemistry parameters. The full laboratory analytical report is attached. The following table provides a summary of the results of select chemical parameters, with reference to the applicable Ontario Drinking Water Quality Standard (ODWQS):

Parameter	ODWQS	MW1	MW2	MW3
Total Dissolved Solids (mg/L)	500	520	670	320
Hardness (mg/L as $CaCO_3$)	500	520	590	320
Ammonia (mg/L as N)	--	0.80	0.091	<0.05
Conductivity (umho/cm)	--	920	1000	590
Dissolved Organic Carbon (mg/L)	5	6.0	1.5	0.83
pH (pH value)	6.5-8.5	7.31	7.77	7.81
Sulphate (mg/L)	500	<1	250	5.3
Alkalinity (mg/L as $CaCO_3$)	--	520	280	300
Chloride (mg/L)	250	11	25	12
Nitrate + Nitrite (mg/L)	10	<0.1	2.06	1.09
Sodium (mg/L)	200	4.6	6.1	3.8

The quality of groundwater collected from MW3 is considered to best represent background shallow groundwater quality (relative to proximity to the Landfill), as this well is situated furthest upgradient (north) from the Landfill.

Relative to the indicated background quality of shallow groundwater at MW3, the level of many classic indicators of landfill leachate (i.e. leachate, iron, boron, etc...) in the samples collected from MW1 and MW2 were not meaningfully elevated. Other indicators of potential Landfill leachate impact, such as total dissolved solids, hardness, conductivity, dissolved organic carbon and sulphate were elevated in relation to background groundwater quality, however these may result from other extraneous factors. Indications of impacts from road salting (sodium and chloride) and agricultural practices (nitrate + nitrite) appear to be low in the samples from all three wells.

The indicators of possible leachate impact to shallow groundwater at MW1 and MW2 (elevated total dissolved solids, hardness, conductivity, dissolved organic carbon and sulphate) is

problematic to attribute to the Landfill based on the inferred southwesterly direction of shallow groundwater flow. If these elevated parameters are a result of landfill leachate impact, given the presence of shallow fill materials and relatively granular upper overburden deposits, it is possible that leachate may be locally travelling along perched watertable conduits above the regional watertable surface and dispersing a short distance to the north before fully infiltrating to the regional watertable surface, then travelling southwestwards.

Combustible Gas Monitoring:

Six of the nine boreholes were equipped as shallow combustible gas monitors (Gas Probes 1 through 6) to provide a monitoring system to identify potential Landfill gas migration through the upper overburden north of the Landfill. These monitors were installed to depths of 1.8 to 3.0m, with screened intervals set above the watertable surface observed in open boreholes on July 21, 2016. However, it was noted that all gas probes contained some level of water when observed in January 2017 and February 2017, indicating that perched groundwater conditions were present in the area under winter and spring conditions. The logs of the gas probe installations are attached. The locations of the gas probes are shown on Figure 1. The gas probes were monitored under winter conditions on January 24, 2017 and February 21, 2017 using a Gastechtor 1238 combustible gas detector.

Conditions on January 24, 2017 were below freezing temperature, no wind and full snow cover. Conditions on February 21, 2017 were at or slightly above freezing, windy and diminishing snow cover.

The following summarizes the Landfill gas monitoring results, as well as water levels in the probes:

Monitor	January 24, 2017	February 21, 2017
GP1	20%LEL, water level 0.99m bgl	none detected, water level 1.49m bgl
GP2	none detected, water level 0.33m bgl	none detected, water level 0.33m bgl
GP3	none detected, water level 1.04m bgl	none detected, water level 0.11m bgl
GP4	trace ~25ppm, water level 0.78m bgl	none detected, water level 1.66m bgl
GP5	trace ~25ppm, water level 1.25m bgl	none detected, water level 1.89m bgl
GP6	trace ~25ppm, water level 0.33m bgl	none detected, water level 0.77m bgl

Notes:
- LEL refers to Lower Explosive Limit.
i. 100% LEL is normally assumed to be 5% gas, or 50,000ppm.
ii. Combustible gas meter is calibrated to Hexane, so assuming the landfill gas detected is mainly methane, a conversion factor of 0.4 should be utilized (e.g. 500ppm gas reading x 0.4 = 200ppm assumed methane).
iii. Gas readings of less than about 50ppm are considered low, and may be representative of natural background. Gas readings of 50ppm to 500ppm

indicate probable low-level landfill impact. Gas readings >500ppm are typically interpreted as significant landfill impact.

Potential for northward Landfill gas migration was indicated at GP1 on January 24, 2017 under frozen ground and low wind conditions. GP1 is located directly north of the Landfill, on the north side of Martin Street, approximately 60m from the landfill mound. It is noteworthy that the combustible gas level at GP5 on the same day, which is located closer to the Landfill, was low. This is indicative of complex subsurface pathways for landfill gases under frozen ground conditions. Low to non-detectable levels of landfill gases were present at the remainder of the monitors on January 24, 2017, which may be attributable to persistently shallow groundwater conditions over the winter of 2016/2017.

No detectable combustible gases were detected in any of the gas probes on February 21, 2017, which is likely attributable to ground thaw, relatively high winds and persistently shallow groundwater conditions over the winter of 2016/2017.

On the basis of the detected combustible gases at GP1, the landfill mound remains potentially active from a combustible gas generation perspective.

For reference, Ontario Regulation 232/98 provides the following objectives for gas levels at Landfill sites:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5 per cent by volume.

- The concentration of methane gas must be less than 1.0 per cent by volume in any on-site building or enclosed structure, and in the area immediately outside the foundation or basement floor of the building or structure, if the building or structure is accessible to any person or contains electrical equipment or a potential source of ignition.

- The concentration of methane gas from the site must be less than 0.05 per cent by volume in any off-site building or enclosed structure, and in the area immediately outside the foundation or basement floor of the building or structure, if the building or structure is accessible to any person or contains electrical equipment or a potential source of ignition.

The detected combustible gases observed at GP1 was approximately 0.4% by volume (20% LEL x 0.4 conversion factor, see above), which meets the Regulation's limits for landfill gases.

D-4 GUIDELINE ASSESSMENT

Fill Area:

The Landfill is located within a ±1.5ha parcel situated south of Martin Street, approximately 160m west of Cork Street, and south of the proposed development. The Landfill is closed, fenced, fully vegetated and is understood to have a soil cap installed *ca.* 2006. It is understood that there are no records of monitoring wells, gas probes or historical monitoring events at the Landfill.

From the proposed development lands, the Landfill site is visible as a fenced, grassed mound. No odour, litter, dust, surface runoff or vermin impacts were observed or detected when viewed from outside the fence line in July 2016, January 2017 and February 2017. According to Environment Canada, prevailing winds in southern Ontario tend to be from the southwest during the warmer seasons, and tend to be from the northwest during the cooler seasons. The proposed development is situated north of the Landfill, and will be generally not downwind of the Landfill. As the Landfill is closed and capped, adverse impacts of odour, dust, vermin and noise are not anticipated in the future.

Land Use:

According to Section 5 of MOECC Guideline D-4, no land use may take place within 30m of a non-operating landfill. The proposed development is located approximately 60 to 70m from the known waste deposit, beyond the 30m limit.

Groundwater Conditions:

Leachate generated by the closed Landfill will flow vertically to the watertable surface, and would be expected to assume the south to southwesterly-direction of groundwater flow, as was inferred above at the monitoring wells installed on the proposed development lands. The ultimate receiver of impact from the closed Landfill would be expected to be the South Saugeen River.

As noted in the above subsurface assessment, possible indications of landfill leachate impact to shallow groundwater are indicated at the two southerly monitoring wells. Based on the inferred southwesterly direction of groundwater flow, this indication of impact is problematic to attribute to the Landfill. However, as suggested above, given the presence of shallow fill materials and relatively granular upper overburden deposits, it is possible that leachate may be locally travelling along perched watertable conduits above the regional watertable surface and dispersing a short distance to the north before fully infiltrating to the regional watertable surface, then travelling southwestwards.

The proposed development is intended to be supplied with water from the Mount Forest municipal water supply, and there will be no on-site water wells for potable use. Due to the presence of possible indications of leachate in shallow groundwater at the proposed development's southern property line (which may have also resulted from other extraneous factors), it is recommended that the subdivision agreement prohibit the construction of water

wells as a conservative measure.

Landfill Gas:

As noted above, observations during the winter of 2016/17 indicate some potential for northward Landfill gas migration under frozen ground and low wind conditions, however the detected levels are within the limits of Ontario Regulation 232/98. As such, no requirements for a landfill gas control system on the proposed development lands are indicated by the combustible gas observations of the winter of 2016/17.

Traffic:

As the Landfill is closed, no traffic issues are indicated.

CONCLUSIONS

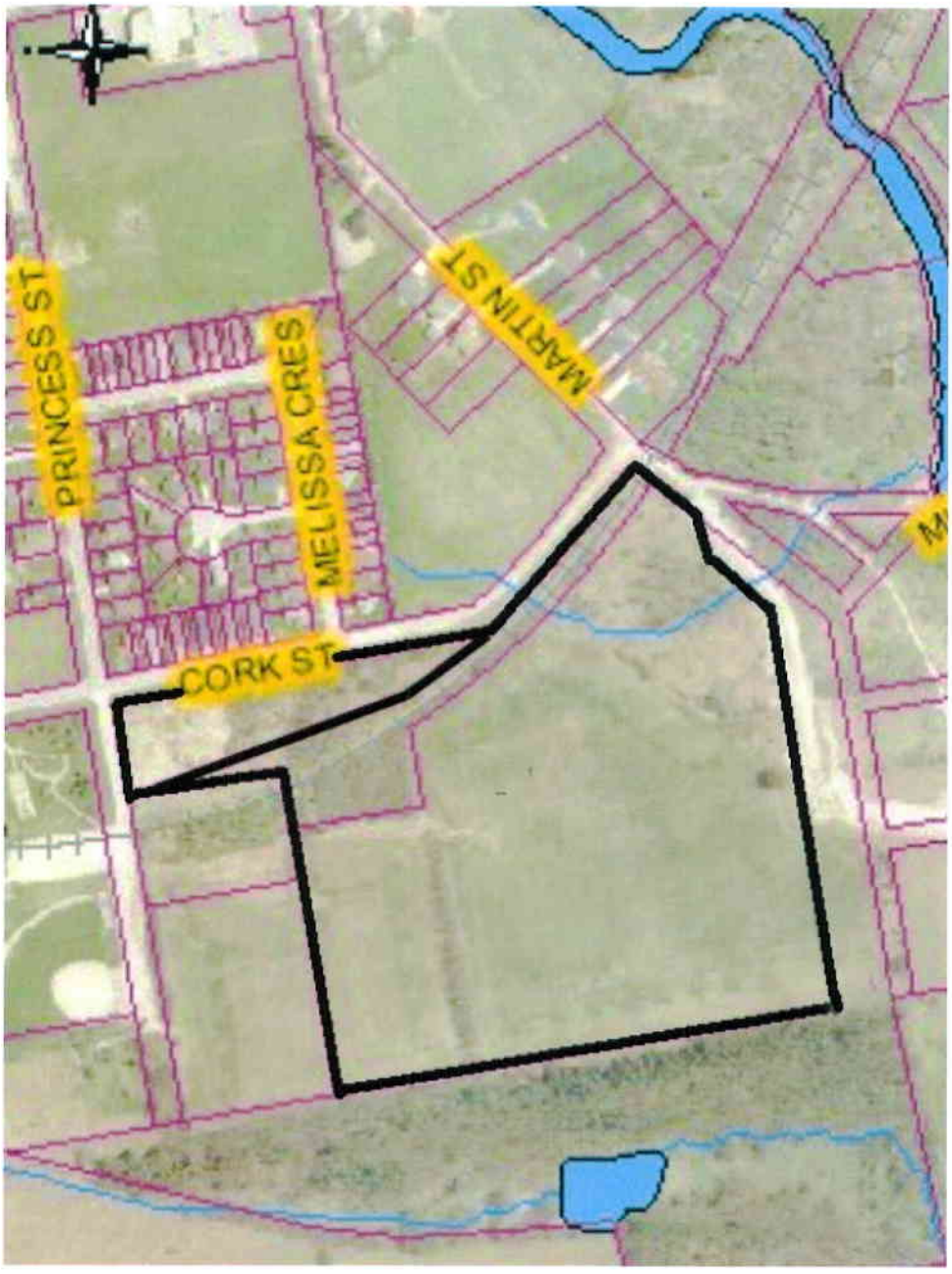
1. From the proposed development lands, when observed on in July, 2016, January 2017 and February, 2017, the Landfill site is visible as a fenced, grassed mound, and no odour, litter, dust, surface runoff or vermin were observed or detected at the closed Landfill. As the Landfill is closed and capped, adverse impacts of odour, dust, vermin and noise are not anticipated in the future.

2. The proposed development is intended to be supplied with water from the Mount Forest municipal water supply, and there will be no on-site water wells for potable use. It is recommended that the subdivision agreement prohibit the construction of water wells as a best management practice.

3. Observations during the winter of 2016/17 indicate some potential for northward Landfill gas migration under frozen ground and low wind conditions, however the detected levels are within the limits of Ontario Regulation 232/98. As such, no requirements for a landfill gas control system on the proposed development lands are indicated by the combustible gas observations of the winter of 2016/17.

Yours sincerely,
IAN D. WILSON ASSOCIATES LIMITED

Geoffrey Rether, P.Geo.


PRINCESS ST
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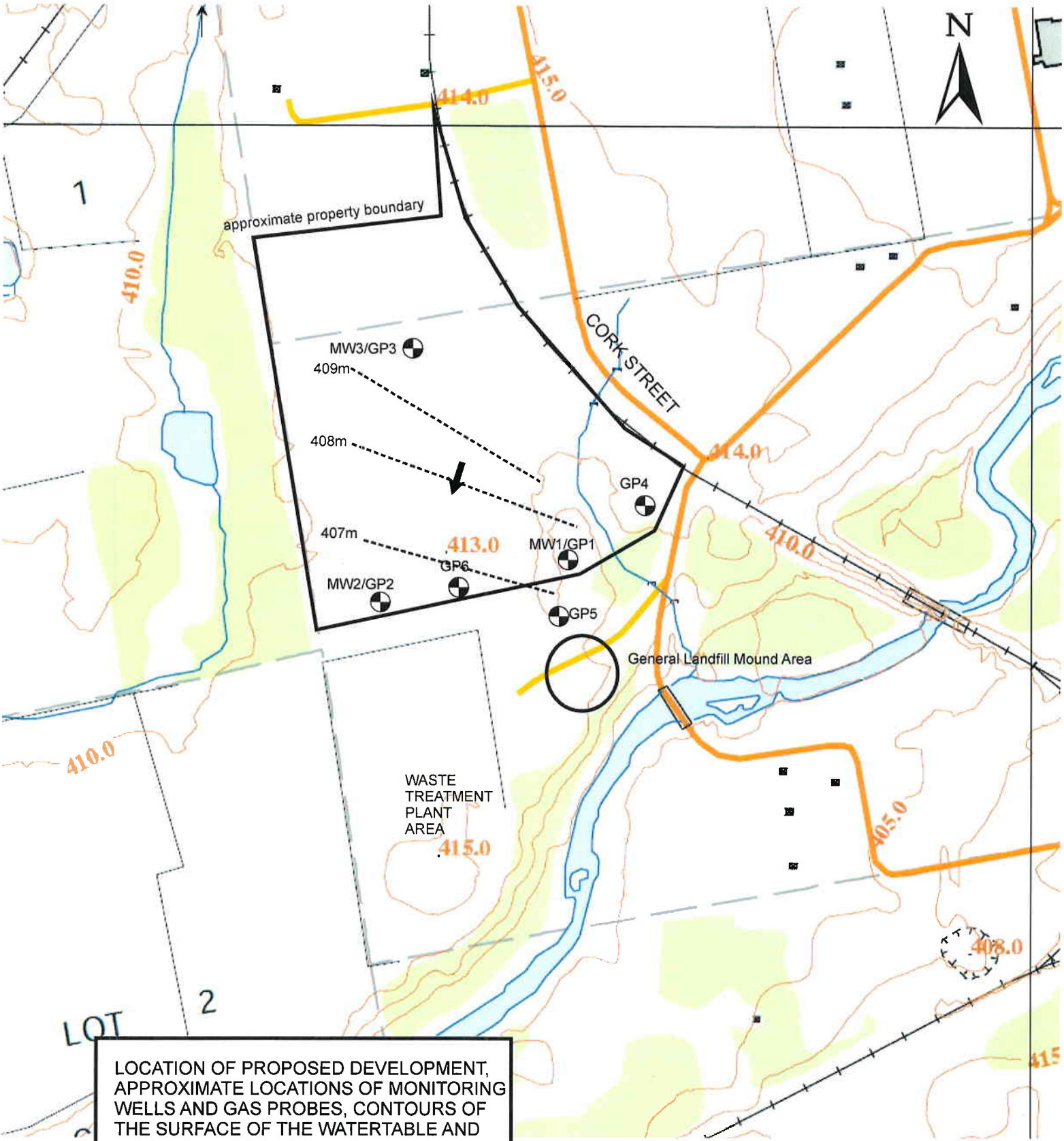
MARTIN ST
CORK ST



LOCATION OF PROPOSED DEVELOPMENT, APPROXIMATE LOCATIONS OF MONITORING WELLS AND GAS PROBES, CONTOURS OF THE SURFACE OF THE WATERTABLE AND INFERRED DIRECTION OF GROUNDWATER FLOW

FIGURE 1

SOUTH SAUGEEN DEVELOPMENTS LTD.

SCALE 1:5,000(approx.)

BOREHOLE VISUAL LOGS - South Saugeen Developments Ltd.

Completed July 21, 2016

BOREHOLE	DEPTH (m)	VISUAL LOG
MW1/GP1	0 - 1.2	FILL - mixture of sand, gravel and silt till
	1.2 - 1.5	buried TOPSOIL
	1.5 - 3.7	brown, soft, dry to wet (2.4m) SILT and fine SAND
	3.7 - 4.6	grey, dense, dry clayey SILT

- Ground surface elevation 409.24m at MW1 (relative to assumed benchmark).
- Monitoring Well - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 3.1m to 4.6m. Imported sand pack installed 2.4 to 4.6m. Bentonite and concrete set grade to 2.4m. Locking steel casing guard.
- Gas Probe (separate borehole) - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 1.2m to 2.7m. Imported sand pack installed 0.9 to 2.7m. Bentonite and concrete set grade to 0.9m. Locking steel casing guard.
- Water level in MW1 January 24, 2017 - 1.80m below grade.

MW2/GP2	0 - 0.2	dark brown TOPSOIL
	0.2 - 1.8	red-brown, lightly compact, dry silty fine SAND
	1.8 - 3.7	brown, compact, dry sandy SILT till
	3.7 - 6.1	grey, lightly compact, dry to wet (4.5m) SILT with some sand

- Ground surface elevation 410.30m at MW2 (relative to assumed benchmark).
- Monitoring Well - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 4.6m to 6.1m. Imported sand pack installed 3.7 to 6.1m. Bentonite and concrete set grade to 3.7m. Locking steel casing guard.
- Gas Probe (separate borehole) - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 1.5m to 3.1m. Imported sand pack installed 1.2 to 3.1m. Bentonite and concrete set grade to 1.2m. Locking steel casing guard.
- Water level in MW2 January 24, 2017 - 5.06m below grade.

BOREHOLE VISUAL LOGS - South Saugeen Developments Ltd.

Completed July 21, 2016

BOREHOLE	DEPTH (m)	VISUAL LOG
MW3/GP3	0 - 0.2	dark brown TOPSOIL
	0.2 - 0.9	light red-brown, loose, dry silty fine SAND
	0.9 - 3.1	light brown, compact, dry to wet (1.5m) silty SAND till

- Ground surface elevation 409.23m at MW3 (relative to assumed benchmark).
- Monitoring Well - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 1.5m to 3.1m. Imported sand pack installed 1.2 to 3.1m. Bentonite and concrete set grade to 1.2m. Locking steel casing guard.
- Gas Probe (separate borehole) - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 0.3m to 1.8m. Imported sand pack installed 0.3 to 1.8m. Bentonite and concrete set grade to 0.3m. Locking steel casing guard.
- Water level in MW3 January 24, 2017 - 0.04m above grade.

GP4	0 - 0.2	dark brown TOPSOIL
	0.2 - 2.4	brown, loose, dry SAND and GRAVEL
	2.4 - 3.1	brown, compact, wet silty SAND till, stony

- Gas Probe - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 1.2m to 2.7m. Imported sand pack installed 0.9 to 3.1m. Bentonite and concrete set grade to 0.9m. Locking steel casing guard.

GP5	0 - 0.2	dark brown TOPSOIL
	0.2 - 1.2	brown, loose, dry silty fine SAND
	1.2 - 2.7	brown, loose, dry SAND and GRAVEL, silty
	2.7 - 3.1	brown, compact, dry silty SAND till

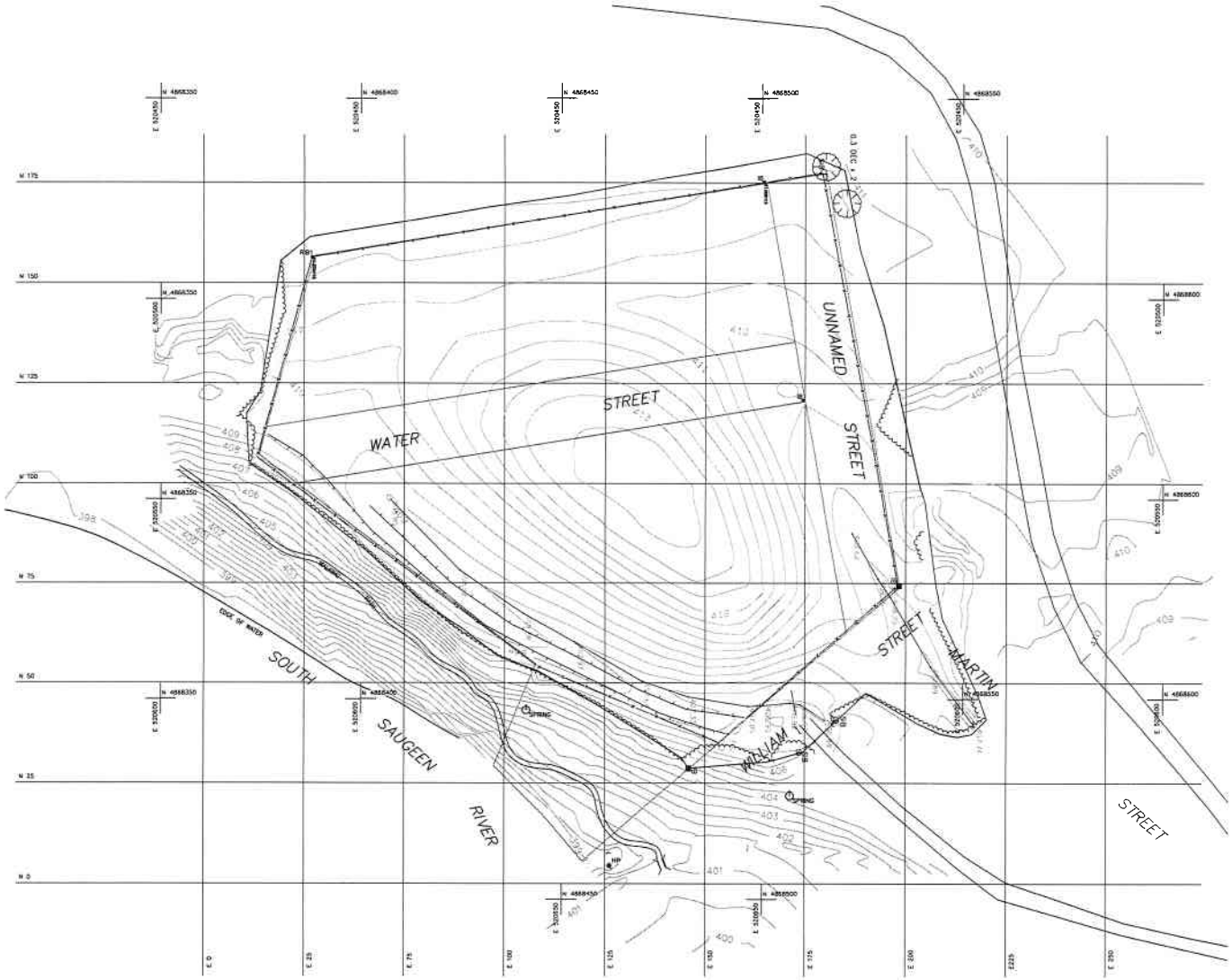
- Gas Probe - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 1.5m to 3.1m. Imported sand pack installed 1.2 to 3.1m. Bentonite and concrete set grade to 1.2m. Locking steel casing guard.

BOREHOLE VISUAL LOGS - South Saugeen Developments Ltd.

Completed July 21, 2016

BOREHOLE	DEPTH (m)	VISUAL LOG
GP6	0 - 0.2	dark brown TOPSOIL
	0.2 - 1.2	red-brown, loose, dry silty fine SAND
	1.2 - 2.4	light brown, compact, dry to wet (2.1m) SILT and SAND till
	2.4 - 3.1	brown, compact, wet silty SAND till

- Gas Probe - 5.1cm-diameter Schedule 40 PVC monitoring well installed. #10 slot PVC screen set 1.5m to 3.1m. Imported sand pack installed 1.2 to 3.1m. Bentonite and concrete set grade to 1.2m. Locking steel casing guard.



	UTM		GROUND	LOCAL	
B	N 4868500.358	E 520470.820	EL. 411.282	N 175.000	E 163.206
A	N 4868510.208	E 520525.206	EL. 410.724	N 120.546	E 170.000

NOTES:

1. PROPERTY DATA REFERENCED FROM PLAN BY BLACK, SHOEMAKER, ROBINSON & DONALDSON LIMITED, DATED FEB. 13, 2001 (PLAN 51R-8659).
2. EXISTING TOPOGRAPHY INFORMATION COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED MARCH 14, 2002.
3. EXISTING TOPOGRAPHY INFORMATION FOR REVISION 'B' COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED MAY 09, 2005.
4. EXISTING TOPOGRAPHY INFORMATION FOR REVISION 'D' COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED SEPTEMBER 20, 2006.

DRAWING ISSUED FOR:

AS CONSTRUCTED

ENG.	CHK	No.	DESCRIPTION	DATE:	BY
WDL	SMP	D	AS CONSTRUCTED	OCT 11/06	WDL

BENCHMARK:

Lonsdale
Consulting Engineers Inc.

County of Wellington

COUNTY OF WELLINGTON
Administration Centre

MOUNT FOREST
LANDFILL
SITE

EXISTING
CONDITIONS
PLAN

PROJECT NORTH

ORIENTATION

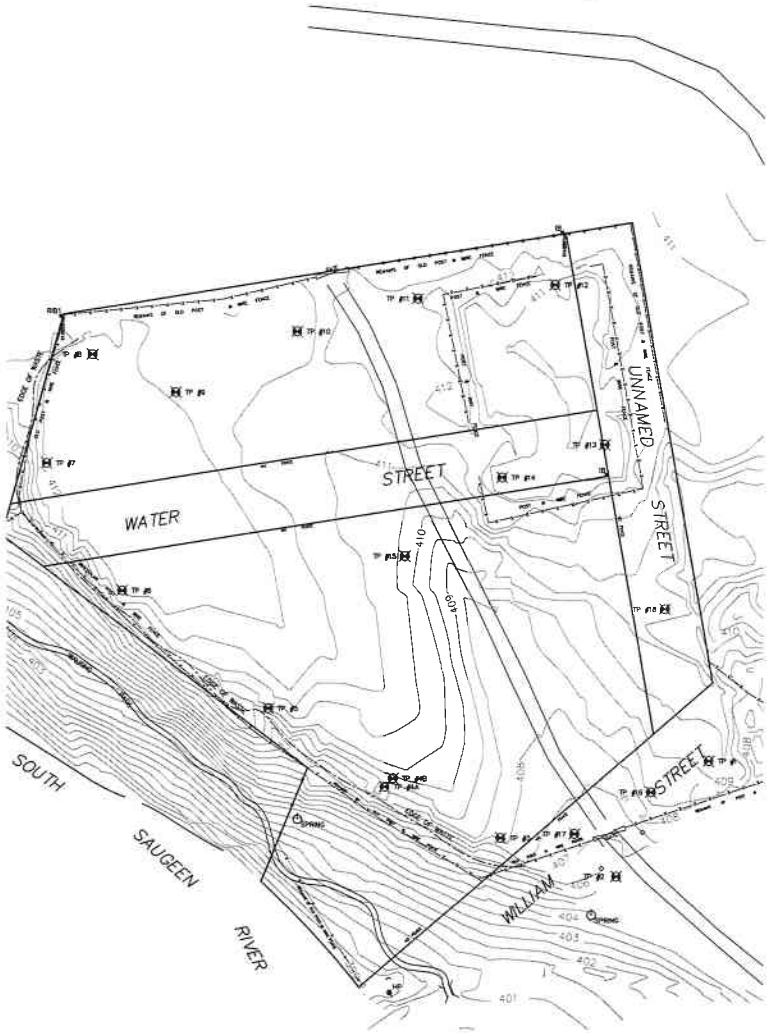
DRAWN BY: S.M.P.

CHECKED BY: W.D.L.

SCALE: 1:500

FILE NAME: 4616D1

EX-01



TEST PIT #8
OFF PROPERTY
SURFACE 409.53
0.0m–0.2m TOPSOIL
0.2m–2.5m RUBBLE – CONCRETE BRICKS SOME ASPHALT
2.5m–3.3m NATIVE – SAND, SOME ROCKS

TEST PIT #2
OFF PROPERTY
SURFACE 408.49
0.0m–0.3m TOPSOIL
0.3m–1.2m NATIVE – PIT RUN

TEST PIT #3
SURFACE 408.34
(MIXED GARBAGE ON SURFACE)
0.0m–0.4m TOPSOIL
0.4m–0.9m MIXED – DIRT, TIRES, SOME GARBAGE
0.9m–1.2m SILT & STONE
1.2m–2.0m NATIVE – PIT RUN

TEST PIT #4A
SURFACE 408.28
0.0m–0.6m TOPSOIL SOME RUBBLE
0.6m–1.4m CLAY/TOPSOIL
1.4m–2.4m NATIVE – SANDY PIT RUN

TEST PIT #4B
SURFACE 408.39
0.0m–0.6m TOPSOIL SOME WASTE
0.6m–2.2m WASTE – WOOD, SOME RESIDENTIAL
2.2m–2.4m NATIVE – SANDY PIT RUN

TEST PIT #5
SURFACE 409.90
(SURFACE GARBAGE – CONSTRUCTION & RESIDENTIAL)
0.0m–1.0m MIX TOPSOIL/GARBAGE
1.0m–3.5m GARBAGE BURNT – DEEP ON WEST SIDE 3.5m, UP ON EAST SIDE 2.0m
3.5m NATIVE – SAND, SOME STONES

TEST PIT #6
SURFACE 411.70
(SURFACE GARBAGE)
0.0m–1.1m TOPSOIL/GARBAGE MIX
1.1m–1.6m MUNICIPAL WASTE
1.6m–3.2m NATIVE – SANDY GRAVEL

TEST PIT #7
SURFACE 412.24
(SURFACE GARBAGE)
0.0m–0.5m TOPSOIL/GARBAGE MIX
0.5m–1.2m DIRT COVER, SOME GARBAGE
1.2m–2.8m BURNT GARBAGE
2.8m–3.0m NATIVE – SANDY CLAY

TEST PIT #8
SURFACE 412.29
0.0m–0.4m TOPSOIL/GARBAGE MIX
0.4m–1.8m MAINLY DIRT, SOME GARBAGE
1.8m–2.2m NATIVE – SUBSOIL
2.2m–2.6m NATIVE – PIT RUN SANDY

TEST PIT #9
SURFACE 411.59
0.0m–0.2m TOPSOIL
0.2m–1.0m BURNT GARBAGE
1.0m–1.6m NATIVE – SAND, SOME STONES

TEST PIT #10
SURFACE 411.63
0.0m–0.3m TOPSOIL
0.3m–1.7m NATIVE – PIT RUN SANDY COURSE

TEST PIT #11
SURFACE 411.98
0.0m–0.2m TOPSOIL
0.2m–0.8m MIXTURE – DIRT/GARBAGE ASPHALT
0.8m–1.5m CLAY/DIRT MIX
1.5m–1.7m CLAY
1.7m–2.0m NATIVE – SANDY PIT RUN, SMALL STONES

TEST PIT #12
SURFACE 411.68
0.0m–1.1m IMPORTED FILL
1.1m–2.0m NATIVE – SANDY PIT RUN

TEST PIT #13
SURFACE 411.19
0.0m–2.9m BURNT GARBAGE, RUBBLE, CONCRETE
2.9m–3.3m PIT RUN
3.3m–3.5m NATIVE – LIGHT BROWN CLAY

TEST PIT #14
SURFACE 411.31
0.0m–0.6m COVER MATERIAL
0.6m–2.9m BURNT GARBAGE
2.9m–3.3m NATIVE – SANDY CLAY

TEST PIT #15
SURFACE 410.33
0.0m–1.9m BURNT GARBAGE
1.9m–2.7m PIT RUN/GARBAGE
2.7m–3.2m NATIVE – LIGHT BROWN CLAY

TEST PIT #16
SURFACE 408.75
0.0m–2.1m RUBBLE, ASPHALT
2.1m–2.8m NATIVE – PIT RUN

TEST PIT #17
SURFACE 407.25
0.0m–0.9m OVERBURDEN – TOPSOIL, PIT RUN, TOPSOIL
0.9m–1.3m NATIVE – PIT RUN

TEST PIT #18
SURFACE 410.30
0.0m–2.1m RUBBLE (CONCRETE BRICKS, ASPHALT)
2.1m–2.5m NATIVE – PIT RUN
2.5m NATIVE – SANDY CLAY

LEGEND
- SURVEY CONTROL POINT
- SIB OR IB FOUND
- SIB OR IB NOT FOUND
- NATURAL SPRING
- HYDRO POLE AND GUY
- GATE
- FENCE
- EDGE OF WASTE
- TEST PITS

NOTES:
1. PROPERTY DATA REFERENCED FROM PLAN BY BLACK, SHOEMAKER, ROBINSON & DONALDSON LIMITED, DATED FEB. 13, 2001 (PLAN 61R-6659).
2. EXISTING TOPOGRAPHY INFORMATION COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED MARCH 14, 2002.
3. EXISTING TOPOGRAPHY INFORMATION COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED MAY 09, 2006.
4. EXISTING TEST PIT INFORMATION COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED MAY 19, 2006.

DRAWING ISSUED FOR:

CLIENT REVIEW

ENG	CHK	No.	DESCRIPTION	DATE:	BY
WDL	SMP	A	RELEASED FOR REVIEW	MAY 25/06	WDL
WDL	SMP	B	RELEASED FOR REVIEW	JUNE 12/06	WDL

BENCHMARK

Lonsdale
Consulting Engineers Inc.

County of Wellington

COUNTY OF WELLINGTON
Administration Centre

MOUNT FOREST
LANDFILL
SITE

SOIL
CONDITIONS
PLAN

PROJECT NO.:

ORIENTATION

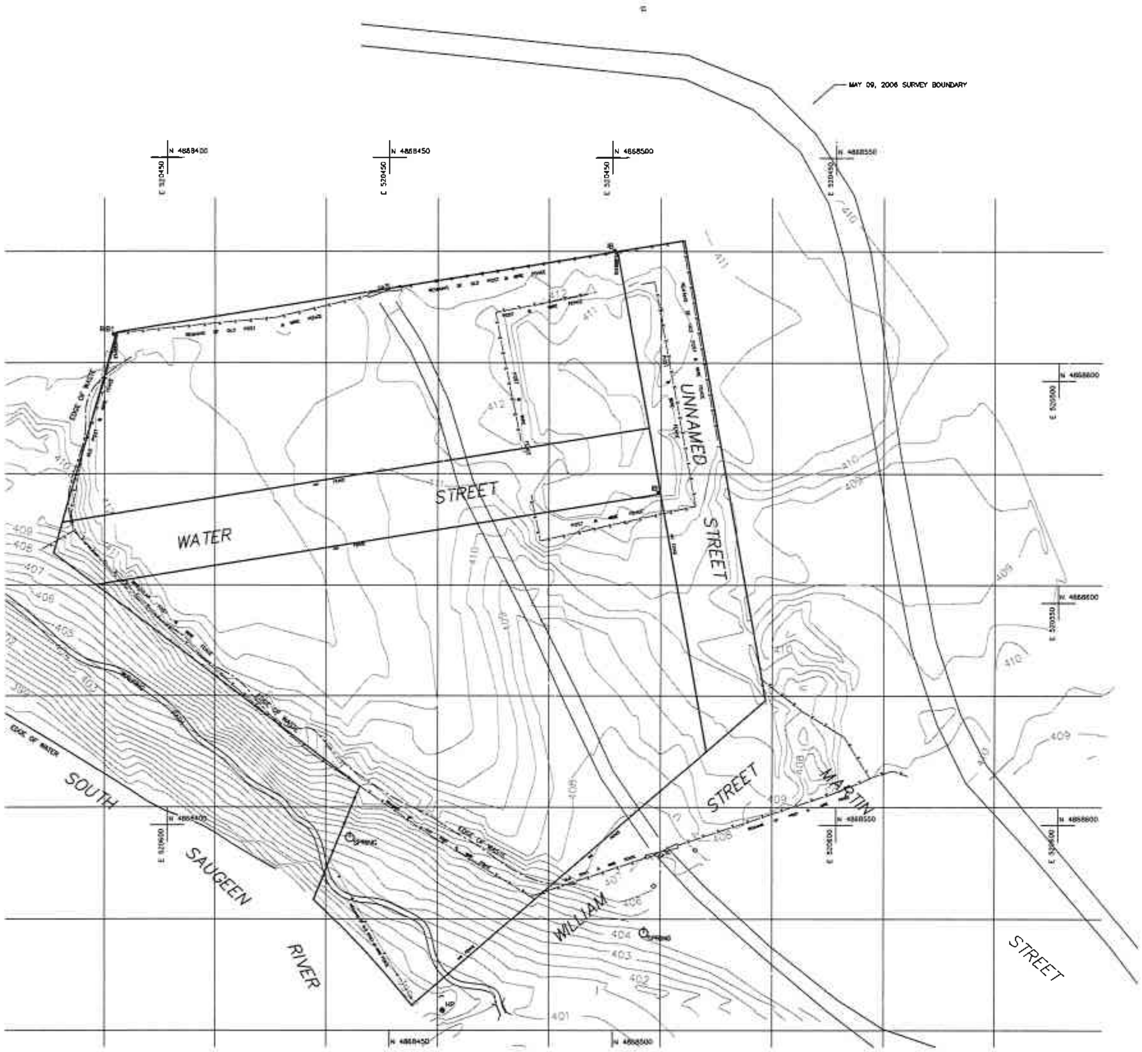
DRAWN BY: S.M.P.

CHECKED BY: W.D.L.

SCALE: 1:500

FILE NAME:

SOIL-01



LEGEND

- SURVEY CONTROL POINT
- SIB OR IB FOUND
- SIB OR IB NOT FOUND
- NATURAL SPRING
- HYDRO POLE AND GUY
- GATE
- FENCE
- EDGE OF WASTE
- LOCAL COORDINATE GRID
- UTM COORDINATE GRID

	UTM		GEODETIC	LOCAL	
SCP #1	N 4868500.318	E 520470.500	EL. 411.202	N 175.000	E 185.206
SCP #2	N 4868510.208	E 520525.206	EL. 410.724	N 120.546	E 175.000

NOTES:

1. PROPERTY DATA REFERENCED FROM PLAN BY BLACK, SHOEMAKER, ROBINSON & DONALDSON LIMITED, DATED FEB. 13, 2001 (PLAN 61R-8659).
2. EXISTING TOPOGRAPHY INFORMATION COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED MARCH 14, 2002.
3. EXISTING TOPOGRAPHY INFORMATION FOR REVISION 'B' COLLECTED BY FIELD SURVEY BY LONSDALE CONSULTING ENGINEERS INC. COMPLETED MAY 09, 2006.

DRAWING ISSUED FOR:

CLIENT REVIEW

DWG	CHK	No.	DESCRIPTION	DATE:	BY
WDL	SMP	A	RELEASED FOR REVIEW	MAY 15/02	WDL
WDL	SMP	B	RELEASED FOR REVIEW	MAY 17/06	WDL
WDL	SMP	C	RELEASED FOR REVIEW	JUNE 13/06	WDL

BENCHMARK

Lonsdale Consulting Engineers Inc.

County of Wellington

COUNTY OF WELLINGTON
Administration Centre

MOUNT FOREST LANDFILL SITE

EXISTING CONDITIONS PLAN

PROJECT NORTH

DRAWN BY: S.M.P.

CHECKED BY: W.D.L.

SCALE: 1:500

ORIENTATION

FILE NAME:

EX-01

Maxxam
A Bureau Veritas Group Company

Your Project #: CORK STREET
Your C.O.C. #: 580130-02-01

Attention:Geoff Rether

Ian D Wilson Associates Ltd
PO Box 299
76722 Airport Rd
Clinton, ON
N0M 1L0

Report Date: 2017/02/01
Report #: R4343489
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B716038
Received: 2017/01/25, 12:55

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	3	N/A	2017/01/30	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	3	N/A	2017/01/30	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	3	N/A	2017/01/30	CAM SOP-00463	EPA 325.2 m
Conductivity	3	N/A	2017/01/30	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2017/01/28	CAM SOP-00446	SM 22 5310 B m
Hardness (calculated as CaCO3)	3	N/A	2017/01/30	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	3	2017/01/28	2017/01/30	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	3	N/A	2017/01/30		
Anion and Cation Sum	3	N/A	2017/01/30		
Total Ammonia-N	3	N/A	2017/01/31	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2017/01/31	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	3	N/A	2017/01/30	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	3	N/A	2017/01/30	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2017/01/30		
Sat. pH and Langelier Index (@ 4C)	3	N/A	2017/01/30		
Sulphate by Automated Colourimetry	3	N/A	2017/01/30	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	3	N/A	2017/01/30		

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Maxxam
A Bureau Veritas Group Company

Your Project #: CORK STREET
Your C.O.C. #: 580130-02-01

Attention:Geoff Rether

Ian D Wilson Associates Ltd
PO Box 299
76722 Airport Rd
Clinton, ON
N0M 1L0

Report Date: 2017/02/01
Report #: R4343489
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B716038
Received: 2017/01/25, 12:55

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods. Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Ashton Gibson
Project Manager
01 Feb 2017 16:42:26

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ashton Gibson, Project Manager
Email: AGibson@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.

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B716038
Report Date: 2017/02/01

Ian D Wilson Associates Ltd
Client Project #: CORK STREET

RCAP - COMPREHENSIVE (LAB FILTERED)

Maxxam ID		DUQ664	DUQ665	DUQ666		
Sampling Date		2017/01/24 11:00	2017/01/24 11:30	2017/01/24 12:00		
COC Number		580130-02-01	580130-02-01	580130-02-01		
	UNITS	S/E MW	S/W MW	N MW	RDL	QC Batch
Calculated Parameters						
Anion Sum	me/L	10.6	11.7	6.54	N/A	4839996
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	520	280	300	1.0	4839990
Calculated TDS	mg/L	520	670	320	1.0	4839999
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.0	1.5	1.8	1.0	4839990
Cation Sum	me/L	10.6	12.1	6.53	N/A	4839996
Hardness (CaCO3)	mg/L	520	590	320	1.0	4840959
Ion Balance (% Difference)	%	0.00	1.96	0.0600	N/A	4839995
Langelier Index (@ 20C)	N/A	0.696	0.854	0.787		4839997
Langelier Index (@ 4C)	N/A	0.449	0.607	0.538		4839998
Saturation pH (@ 20C)	N/A	6.62	6.91	7.03		4839997
Saturation pH (@ 4C)	N/A	6.87	7.16	7.28		4839998
Inorganics						
Total Ammonia-N	mg/L	0.80	0.091	ND	0.050	4844065
Conductivity	umho/cm	920	1000	590	1.0	4843207
Dissolved Organic Carbon	mg/L	6.0	1.5	0.83	0.20	4841372
Orthophosphate (P)	mg/L	ND	0.011	ND	0.010	4843256
pH	pH	7.31	7.77	7.81		4843213
Dissolved Sulphate (SO4)	mg/L	ND	250	5.3	1.0	4843258
Alkalinity (Total as CaCO3)	mg/L	520	280	300	1.0	4843206
Dissolved Chloride (Cl)	mg/L	11	25	12	1.0	4843229
Nitrite (N)	mg/L	0.012	ND	ND	0.010	4843877
Nitrate (N)	mg/L	ND	2.06	1.09	0.10	4843877
Nitrate + Nitrite (N)	mg/L	ND	2.06	1.09	0.10	4843877
Metals						
Dissolved Aluminum (Al)	ug/L	ND	ND	ND	5.0	4843176
Dissolved Antimony (Sb)	ug/L	ND	ND	ND	0.50	4843176
Dissolved Arsenic (As)	ug/L	1.7	ND	ND	1.0	4843176
Dissolved Barium (Ba)	ug/L	73	96	17	2.0	4843176
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	0.50	4843176
Dissolved Boron (B)	ug/L	17	35	17	10	4843176
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	0.10	4843176
Dissolved Calcium (Ca)	ug/L	140000	140000	83000	200	4843176
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	5.0	4843176

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B716038
Report Date: 2017/02/01

Ian D Wilson Associates Ltd
Client Project #: CORK STREET

RCAP - COMPREHENSIVE (LAB FILTERED)

Maxxam ID		DUQ664	DUQ665	DUQ666		
Sampling Date		2017/01/24 11:00	2017/01/24 11:30	2017/01/24 12:00		
COC Number		580130-02-01	580130-02-01	580130-02-01		
	UNITS	S/E MW	S/W MW	N MW	RDL	QC Batch
Dissolved Cobalt (Co)	ug/L	6.9	ND	ND	0.50	4843176
Dissolved Copper (Cu)	ug/L	1.7	1.6	ND	1.0	4843176
Dissolved Iron (Fe)	ug/L	ND	ND	ND	100	4843176
Dissolved Lead (Pb)	ug/L	ND	ND	ND	0.50	4843176
Dissolved Magnesium (Mg)	ug/L	42000	59000	27000	50	4843176
Dissolved Manganese (Mn)	ug/L	2500	ND	ND	2.0	4843176
Dissolved Molybdenum (Mo)	ug/L	ND	1.0	ND	0.50	4843176
Dissolved Nickel (Ni)	ug/L	3.0	2.5	ND	1.0	4843176
Dissolved Phosphorus (P)	ug/L	ND	ND	ND	100	4843176
Dissolved Potassium (K)	ug/L	700	2900	390	200	4843176
Dissolved Selenium (Se)	ug/L	ND	5.1	ND	2.0	4843176
Dissolved Silicon (Si)	ug/L	4600	4200	2100	50	4843176
Dissolved Silver (Ag)	ug/L	ND	ND	ND	0.10	4843176
Dissolved Sodium (Na)	ug/L	4600	6100	3800	100	4843176
Dissolved Strontium (Sr)	ug/L	160	220	84	1.0	4843176
Dissolved Thallium (Tl)	ug/L	ND	ND	ND	0.050	4843176
Dissolved Titanium (Ti)	ug/L	ND	ND	ND	5.0	4843176
Dissolved Uranium (U)	ug/L	1.0	3.8	0.37	0.10	4843176
Dissolved Vanadium (V)	ug/L	ND	ND	ND	0.50	4843176
Dissolved Zinc (Zn)	ug/L	ND	ND	ND	5.0	4843176

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

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A Bureau Veritas Group Company

Maxxam Job #: B716038
Report Date: 2017/02/01

Ian D Wilson Associates Ltd
Client Project #: CORK STREET

TEST SUMMARY

Maxxam ID: DUQ664
Sample ID: S/E MW
Matrix: Water

Collected: 2017/01/24
Shipped:
Received: 2017/01/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4843206	N/A	2017/01/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4839990	N/A	2017/01/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	4843229	N/A	2017/01/30	Deonarine Ramnarine
Conductivity	AT	4843207	N/A	2017/01/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4841372	N/A	2017/01/28	Yogesh Patel
Hardness (calculated as CaCO3)		4840959	N/A	2017/01/30	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	4843176	2017/01/28	2017/01/30	John Bowman
Ion Balance (% Difference)	CALC	4839995	N/A	2017/01/30	Automated Statchk
Anion and Cation Sum	CALC	4839996	N/A	2017/01/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4844065	N/A	2017/01/31	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4843877	N/A	2017/01/31	Chandra Nandlal
pH	AT	4843213	N/A	2017/01/30	Surinder Rai
Orthophosphate	KONE	4843256	N/A	2017/01/30	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4839997	N/A	2017/01/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4839998	N/A	2017/01/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4843258	N/A	2017/01/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4839999	N/A	2017/01/30	Automated Statchk

Maxxam ID: DUQ665
Sample ID: S/W MW
Matrix: Water

Collected: 2017/01/24
Shipped:
Received: 2017/01/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4843206	N/A	2017/01/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4839990	N/A	2017/01/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	4843229	N/A	2017/01/30	Deonarine Ramnarine
Conductivity	AT	4843207	N/A	2017/01/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4841372	N/A	2017/01/28	Yogesh Patel
Hardness (calculated as CaCO3)		4840959	N/A	2017/01/30	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	4843176	2017/01/28	2017/01/30	John Bowman
Ion Balance (% Difference)	CALC	4839995	N/A	2017/01/30	Automated Statchk
Anion and Cation Sum	CALC	4839996	N/A	2017/01/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4844065	N/A	2017/01/31	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4843877	N/A	2017/01/31	Chandra Nandlal
pH	AT	4843213	N/A	2017/01/30	Surinder Rai
Orthophosphate	KONE	4843256	N/A	2017/01/30	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4839997	N/A	2017/01/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4839998	N/A	2017/01/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4843258	N/A	2017/01/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4839999	N/A	2017/01/30	Automated Statchk

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Maxxam Job #: B716038
Report Date: 2017/02/01

Ian D Wilson Associates Ltd
Client Project #: CORK STREET

TEST SUMMARY

Maxxam ID: DUQ666
Sample ID: N MW
Matrix: Water

Collected: 2017/01/24
Shipped:
Received: 2017/01/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4843206	N/A	2017/01/30	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4839990	N/A	2017/01/30	Automated Statchk
Chloride by Automated Colourimetry	KONE	4843229	N/A	2017/01/30	Deonarine Ramnarine
Conductivity	AT	4843207	N/A	2017/01/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4841372	N/A	2017/01/28	Yogesh Patel
Hardness (calculated as CaCO3)		4840959	N/A	2017/01/30	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	4843176	2017/01/28	2017/01/30	John Bowman
Ion Balance (% Difference)	CALC	4839995	N/A	2017/01/30	Automated Statchk
Anion and Cation Sum	CALC	4839996	N/A	2017/01/30	Automated Statchk
Total Ammonia-N	LACH/NH4	4844065	N/A	2017/01/31	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4843877	N/A	2017/01/31	Chandra Nandlal
pH	AT	4843213	N/A	2017/01/30	Surinder Rai
Orthophosphate	KONE	4843256	N/A	2017/01/30	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4839997	N/A	2017/01/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4839998	N/A	2017/01/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4843258	N/A	2017/01/30	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4839999	N/A	2017/01/30	Automated Statchk

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GENERAL COMMENTS

Sample DUQ665 [S/W MW] : ortho-Phosphate > Total Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B716038
Report Date: 2017/02/01

Ian D Wilson Associates Ltd
Client Project #: CORK STREET

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4841372	YPA	Matrix Spike	Dissolved Organic Carbon	2017/01/27		94	%	80 - 120
4841372	YPA	Spiked Blank	Dissolved Organic Carbon	2017/01/27		96	%	80 - 120
4841372	YPA	Method Blank	Dissolved Organic Carbon	2017/01/27	0.33, RDL=0.20		mg/L	
4841372	YPA	RPD	Dissolved Organic Carbon	2017/01/27	0.87		%	20
4843176	JBW	Matrix Spike	Dissolved Aluminum (Al)	2017/01/30		106	%	80 - 120
			Dissolved Antimony (Sb)	2017/01/30		111	%	80 - 120
			Dissolved Arsenic (As)	2017/01/30		103	%	80 - 120
			Dissolved Barium (Ba)	2017/01/30		107	%	80 - 120
			Dissolved Beryllium (Be)	2017/01/30		106	%	80 - 120
			Dissolved Boron (B)	2017/01/30		105	%	80 - 120
			Dissolved Cadmium (Cd)	2017/01/30		108	%	80 - 120
			Dissolved Calcium (Ca)	2017/01/30		102	%	80 - 120
			Dissolved Chromium (Cr)	2017/01/30		104	%	80 - 120
			Dissolved Cobalt (Co)	2017/01/30		102	%	80 - 120
			Dissolved Copper (Cu)	2017/01/30		109	%	80 - 120
			Dissolved Iron (Fe)	2017/01/30		103	%	80 - 120
			Dissolved Lead (Pb)	2017/01/30		102	%	80 - 120
			Dissolved Magnesium (Mg)	2017/01/30		103	%	80 - 120
			Dissolved Manganese (Mn)	2017/01/30		103	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/01/30		110	%	80 - 120
			Dissolved Nickel (Ni)	2017/01/30		102	%	80 - 120
			Dissolved Phosphorus (P)	2017/01/30		108	%	80 - 120
			Dissolved Potassium (K)	2017/01/30		104	%	80 - 120
			Dissolved Selenium (Se)	2017/01/30		104	%	80 - 120
			Dissolved Silicon (Si)	2017/01/30		105	%	80 - 120
			Dissolved Silver (Ag)	2017/01/30		102	%	80 - 120
			Dissolved Sodium (Na)	2017/01/30		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/01/30		104	%	80 - 120
			Dissolved Thallium (Tl)	2017/01/30		102	%	80 - 120
			Dissolved Titanium (Ti)	2017/01/30		107	%	80 - 120
			Dissolved Uranium (U)	2017/01/30		101	%	80 - 120
			Dissolved Vanadium (V)	2017/01/30		104	%	80 - 120
			Dissolved Zinc (Zn)	2017/01/30		103	%	80 - 120
4843176	JBW	Spiked Blank	Dissolved Aluminum (Al)	2017/01/30		101	%	80 - 120
			Dissolved Antimony (Sb)	2017/01/30		104	%	80 - 120
			Dissolved Arsenic (As)	2017/01/30		98	%	80 - 120
			Dissolved Barium (Ba)	2017/01/30		102	%	80 - 120
			Dissolved Beryllium (Be)	2017/01/30		100	%	80 - 120
			Dissolved Boron (B)	2017/01/30		97	%	80 - 120
			Dissolved Cadmium (Cd)	2017/01/30		102	%	80 - 120
			Dissolved Calcium (Ca)	2017/01/30		96	%	80 - 120
			Dissolved Chromium (Cr)	2017/01/30		98	%	80 - 120
			Dissolved Cobalt (Co)	2017/01/30		98	%	80 - 120
			Dissolved Copper (Cu)	2017/01/30		102	%	80 - 120
			Dissolved Iron (Fe)	2017/01/30		99	%	80 - 120
			Dissolved Lead (Pb)	2017/01/30		99	%	80 - 120
			Dissolved Magnesium (Mg)	2017/01/30		101	%	80 - 120
			Dissolved Manganese (Mn)	2017/01/30		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/01/30		103	%	80 - 120
			Dissolved Nickel (Ni)	2017/01/30		96	%	80 - 120
			Dissolved Phosphorus (P)	2017/01/30		103	%	80 - 120
			Dissolved Potassium (K)	2017/01/30		100	%	80 - 120
			Dissolved Selenium (Se)	2017/01/30		99	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silicon (Si)	2017/01/30		100	%	80 - 120
			Dissolved Silver (Ag)	2017/01/30		101	%	80 - 120
			Dissolved Sodium (Na)	2017/01/30		100	%	80 - 120
			Dissolved Strontium (Sr)	2017/01/30		100	%	80 - 120
			Dissolved Thallium (Tl)	2017/01/30		99	%	80 - 120
			Dissolved Titanium (Ti)	2017/01/30		101	%	80 - 120
			Dissolved Uranium (U)	2017/01/30		97	%	80 - 120
			Dissolved Vanadium (V)	2017/01/30		101	%	80 - 120
			Dissolved Zinc (Zn)	2017/01/30		100	%	80 - 120
4843176	JBW	Method Blank	Dissolved Aluminum (Al)	2017/01/30	ND, RDL=5.0		ug/L	
			Dissolved Antimony (Sb)	2017/01/30	ND, RDL=0.50		ug/L	
			Dissolved Arsenic (As)	2017/01/30	ND, RDL=1.0		ug/L	
			Dissolved Barium (Ba)	2017/01/30	ND, RDL=2.0		ug/L	
			Dissolved Beryllium (Be)	2017/01/30	ND, RDL=0.50		ug/L	
			Dissolved Boron (B)	2017/01/30	ND, RDL=10		ug/L	
			Dissolved Cadmium (Cd)	2017/01/30	ND, RDL=0.10		ug/L	
			Dissolved Calcium (Ca)	2017/01/30	ND, RDL=200		ug/L	
			Dissolved Chromium (Cr)	2017/01/30	ND, RDL=5.0		ug/L	
			Dissolved Cobalt (Co)	2017/01/30	ND, RDL=0.50		ug/L	
			Dissolved Copper (Cu)	2017/01/30	ND, RDL=1.0		ug/L	
			Dissolved Iron (Fe)	2017/01/30	ND, RDL=100		ug/L	
			Dissolved Lead (Pb)	2017/01/30	ND, RDL=0.50		ug/L	
			Dissolved Magnesium (Mg)	2017/01/30	ND, RDL=50		ug/L	
			Dissolved Manganese (Mn)	2017/01/30	ND, RDL=2.0		ug/L	
			Dissolved Molybdenum (Mo)	2017/01/30	ND, RDL=0.50		ug/L	
			Dissolved Nickel (Ni)	2017/01/30	ND, RDL=1.0		ug/L	
			Dissolved Phosphorus (P)	2017/01/30	ND, RDL=100		ug/L	
			Dissolved Potassium (K)	2017/01/30	ND, RDL=200		ug/L	
			Dissolved Selenium (Se)	2017/01/30	ND, RDL=2.0		ug/L	
			Dissolved Silicon (Si)	2017/01/30	ND, RDL=50		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2017/01/30	ND, RDL=0.10		ug/L	
			Dissolved Sodium (Na)	2017/01/30	ND, RDL=100		ug/L	
			Dissolved Strontium (Sr)	2017/01/30	ND, RDL=1.0		ug/L	
			Dissolved Thallium (Tl)	2017/01/30	ND, RDL=0.050		ug/L	
			Dissolved Titanium (Ti)	2017/01/30	ND, RDL=5.0		ug/L	
			Dissolved Uranium (U)	2017/01/30	ND, RDL=0.10		ug/L	
			Dissolved Vanadium (V)	2017/01/30	ND, RDL=0.50		ug/L	
			Dissolved Zinc (Zn)	2017/01/30	ND, RDL=5.0		ug/L	
4843176	JBW	RPD	Dissolved Aluminum (Al)	2017/01/30	NC		%	20
			Dissolved Antimony (Sb)	2017/01/30	NC		%	20
			Dissolved Arsenic (As)	2017/01/30	NC		%	20
			Dissolved Barium (Ba)	2017/01/30	NC		%	20
			Dissolved Beryllium (Be)	2017/01/30	NC		%	20
			Dissolved Boron (B)	2017/01/30	0.65		%	20
			Dissolved Cadmium (Cd)	2017/01/30	NC		%	20
			Dissolved Calcium (Ca)	2017/01/30	NC		%	20
			Dissolved Chromium (Cr)	2017/01/30	NC		%	20
			Dissolved Cobalt (Co)	2017/01/30	NC		%	20
			Dissolved Copper (Cu)	2017/01/30	NC		%	20
			Dissolved Iron (Fe)	2017/01/30	NC		%	20
			Dissolved Lead (Pb)	2017/01/30	NC		%	20
			Dissolved Magnesium (Mg)	2017/01/30	NC		%	20
			Dissolved Manganese (Mn)	2017/01/30	NC		%	20
			Dissolved Molybdenum (Mo)	2017/01/30	NC		%	20
			Dissolved Nickel (Ni)	2017/01/30	NC		%	20
			Dissolved Phosphorus (P)	2017/01/30	NC		%	20
			Dissolved Potassium (K)	2017/01/30	NC		%	20
			Dissolved Selenium (Se)	2017/01/30	NC		%	20
			Dissolved Silicon (Si)	2017/01/30	2.3		%	20
			Dissolved Silver (Ag)	2017/01/30	NC		%	20
			Dissolved Sodium (Na)	2017/01/30	0.71		%	20
			Dissolved Strontium (Sr)	2017/01/30	NC		%	20
			Dissolved Thallium (Tl)	2017/01/30	NC		%	20
			Dissolved Titanium (Ti)	2017/01/30	NC		%	20
			Dissolved Uranium (U)	2017/01/30	NC		%	20
			Dissolved Vanadium (V)	2017/01/30	NC		%	20
			Dissolved Zinc (Zn)	2017/01/30	NC		%	20
4843206	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2017/01/30		94	%	85 - 115
4843206	SAU	Method Blank	Alkalinity (Total as CaCO3)	2017/01/30	ND, RDL=1.0		mg/L	
4843206	SAU	RPD	Alkalinity (Total as CaCO3)	2017/01/30	0.57		%	20
4843207	SAU	Spiked Blank	Conductivity	2017/01/30		101	%	85 - 115
4843207	SAU	Method Blank	Conductivity	2017/01/30	ND, RDL=1.0		umho/cm	
4843207	SAU	RPD	Conductivity	2017/01/30	0.091		%	25

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B716038
Report Date: 2017/02/01

Ian D Wilson Associates Ltd
Client Project #: CORK STREET

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4843213	SAU	Spiked Blank	pH	2017/01/30		102	%	98 - 103
4843213	SAU	RPD	pH	2017/01/30	0.48		%	N/A
4843229	DRM	Matrix Spike	Dissolved Chloride (Cl)	2017/01/30		NC	%	80 - 120
4843229	DRM	Spiked Blank	Dissolved Chloride (Cl)	2017/01/30		103	%	80 - 120
4843229	DRM	Method Blank	Dissolved Chloride (Cl)	2017/01/30	ND, RDL=1.0		mg/L	
4843229	DRM	RPD	Dissolved Chloride (Cl)	2017/01/30	2.8		%	20
4843256	ADB	Matrix Spike	Orthophosphate (P)	2017/01/30		NC	%	75 - 125
4843256	ADB	Spiked Blank	Orthophosphate (P)	2017/01/30		100	%	80 - 120
4843256	ADB	Method Blank	Orthophosphate (P)	2017/01/30	ND, RDL=0.010		mg/L	
4843256	ADB	RPD	Orthophosphate (P)	2017/01/30	1.3		%	25
4843258	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2017/01/30		NC	%	75 - 125
4843258	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2017/01/30		100	%	80 - 120
4843258	ADB	Method Blank	Dissolved Sulphate (SO4)	2017/01/30	ND, RDL=1.0		mg/L	
4843258	ADB	RPD	Dissolved Sulphate (SO4)	2017/01/30	1.2		%	20
4843877	C_N	Matrix Spike	Nitrite (N)	2017/01/31		103	%	80 - 120
			Nitrate (N)	2017/01/31		107	%	80 - 120
4843877	C_N	Spiked Blank	Nitrite (N)	2017/01/31		98	%	80 - 120
			Nitrate (N)	2017/01/31		108	%	80 - 120
4843877	C_N	Method Blank	Nitrite (N)	2017/01/31	ND, RDL=0.010		mg/L	
			Nitrate (N)	2017/01/31	ND, RDL=0.10		mg/L	
4843877	C_N	RPD	Nitrite (N)	2017/01/31	NC		%	20
			Nitrate (N)	2017/01/31	NC		%	20
4844065	COP	Matrix Spike	Total Ammonia-N	2017/01/31		101	%	80 - 120
4844065	COP	Spiked Blank	Total Ammonia-N	2017/01/31		103	%	85 - 115
4844065	COP	Method Blank	Total Ammonia-N	2017/01/31	ND, RDL=0.050		mg/L	
4844065	COP	RPD	Total Ammonia-N	2017/01/31	NC		%	20

N/A = Not Applicable

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 sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B716038
Report Date: 2017/02/01

Ian D Wilson Associates Ltd
Client Project #: CORK STREET

VALIDATION SIGNATURE PAGE

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

Brad Newman, 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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Tag#: A177504

Ontario Ministry of the Environment

Well Tag No. (Place Sticker and/or Print Below): A177504

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: ☐ Metric ☒ Imperial

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	
PADFIELD, JOHN B, PADFIELD, ANNE MN & McDONALD, LYNN D.		John P@wightman.ca	☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1091 WALTON AVE. N.	LISTOWEL	ON	N4W3S2	5193036047

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Cork St, Mount Forest	WELLINGTON NORTH; NW corner of CORK ST & MARTIN ST	W½ Lot 2	Conc. Wellington Bound Rd

County/District/Municipality	City/Town/Village	Province	Postal Code
WELLINGTON COUNTY	Mount Forest	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	520544	4868572	Plan 61R7789 (Parts 2,3,4,5) less 61R9357, Part 9 (easement Plan 61R9357) and Part 10	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Sand	Gravel	loose	0.	4'
Brown	Sand	—	loose	4'	8
Brown	Sand	Silt	loose	8'	15

"Cluster of 9 monitoring wells"

GPS 17T 520544, 4868572

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	8'	Bentonite	
8'	15'	Sand	

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ___ hrs + ___ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☒ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction

☐ Cable Tool ☐ Diamond ☒ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☒ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
2"	Plastic		0'	10'

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
2"	Plastic		10'	15'

Status of Well

☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Map of Well Location

Please provide a map below following instructions on the back.

Comments: Water treatment

Water Details

Water found at Depth	Kind of Water
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
London Soil Test Ltd.	7190

Business Address (Street Number/Name)	Municipality
3376 White Oak Rd, Unit 16	LONDON

Province	Postal Code	Business E-mail Address
ON	N6E2Z9	info@londonsoil.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5194555717	Sayers, James

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2 3 5 2	[signature]	2016 08 22

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No	Y Y Y Y M M D D	2016 07 26

Ministry Use Only

Audit No. Z 202419

Received

Well Owner's Copy