

**REPORT ON  
RESULTS OF PHASE 2  
SUBSURFACE ENVIRONMENTAL  
SITE ASSESSMENT  
349 DAVIS RD.  
OAKVILLE, ONTARIO**

Ref. No. G-04.0106  
March 2004

Prepared for

Andrews Carpentry/Contracting  
6 Thomas Street  
Beeton, Ontario  
L0G 1A0

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*DJA ENVIRONMENTAL*  
*OF Geo-Canada*  
*BH #2 & #3*  
*QUESTIONED*  
*GROUND WATER*  
*TEST METHOD DELIVER*  
*SURFACE WATER*  
*could have if had*  
*SCREENS & CONTAINERS*  
*on surface*  
*SCREENS IN DRILLS Geo-Canada USES didn't draw water from*  
*SURFACE*

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**RESULTS OF PHASE 2 SUBSURFACE  
ENVIRONMENTAL SITE ASSESSMENT  
349 DAVIS ROAD  
OAKVILLE, ONTARIO**

**1.0 INTRODUCTION**

Geo-Canada Ltd. (Geo-Canada) was retained by Andrews Carpentry / Contracting (Andrews Carpentry), care of Widex Canada Ltd., to undertake a Phase II Environmental Site Assessment (Phase II ESA) for the property located at 349 Davis Road, in Oakville, Ontario.

This Phase II ESA was conducted in response to the findings of our Phase I Environmental Site Assessment (Phase I ESA), which was issued on March 12, 2004. Our Phase I ESA reached the following conclusions:

- An underground storage tank has been removed from the property to the immediate east (359 Davis Road) of the subject property. Both the Technical Safety and Standards Association (TSSA) and the Ministry of the Environment (MOE) have no record of the tank removal, but anecdotal evidence suggests that the underground storage tank (UST) was located within a few metres, or less, of the eastern property line of 349 Davis Road and was used for gasoline storage.
- The property to the immediate east of the subject property (359 Davis Road) has historically been used as an auto body shop. A Fire Insurance Plan, dated 1967,

indicates that a spray painting booth was present near the eastern property limit of 349 Davis Road.

- The property located to the immediate south (354 Davis Road) of the subject property is classified by MOE as an unapproved landfill site. The site is currently considered a “brownfield” site and is undergoing environmental monitoring. The MOE has knowledge that concentrations of Cadmium, Copper, Boron, and Lead in groundwater samples are in excess guideline parameter concentrations. Detectable concentrations of Vinyl Chloride have also been reported by MOE.
- Previous usage of the subject property for “battery and tire storage” between 1932 and 1967 could be cause for environmental concern. The business conducted by ESSO at the subject site between 1970 and 1973 is not known and ESSO would not return our telephone calls in this respect.

## **2.0 INVESTIGATION METHODOLOGY**

As indicated on the attached Figures No.1 and 2, a total of six (6) boreholes were distributed throughout the subject property, with two (2) boreholes near the southern property limit, two (2) boreholes along the eastern property limit, one borehole near the northern property limit, and a final borehole along the northern exterior wall of the existing structure. The boreholes along the eastern and southern property limits were placed in response to the findings of our Phase I ESA, which indicated that an underground storage tank had recently been removed from 359 Davis Road, and that an unapproved hazardous landfill site is present to the immediate south of the subject property (354 Davis Road, formerly occupied by Ferro Industrial Products). It should be

cautioned, however, that we do not know exactly where the former UST was located and, as such, the location of Borehole 04-3 may not be optimal.

An assessment of the building area for asbestos-containing building materials was not within the scope of this current investigation. Our borehole program was also limited to the outside area of the building.

The boreholes were advanced to depths ranging from 1.6 to 4.6m below ground surface by a track-mounted power auger on February 19, 2004, using conventional solid-stem augers. Representative soil sampling was carried out by means of a standard split-spoon sampler, driven by a hammer with a driving energy equal to the Standard Penetration Test (SPT).

The soil samples were carefully logged on site and split longitudinally, with half being placed in clean environmental clean glass jars and the other half being placed in plastic bags for chemical analysis and headspace testing with a Trace-Tector calibrated to Hexane. In order to minimize cross contamination between successive samples, the split spoon sampler was washed between each sampling interval with a diluted mixture of laboratory-grade detergent and then rinsed with distilled water.

The environmental samples were preserved in cold storage for one day prior to delivering them to Entech's laboratory.

Upon completion of drilling operations, boreholes 04-1, 04-2, and 04-3 were fitted with 50mm diameter environmental monitoring wells, and all remaining holes were sealed with bentonite in accordance with Ontario Regulation 903. In order to protect the monitoring wells, boreholes 04-1 and 04-3 were fitted with standard flush-mounted well covers and Borehole 04-2 was fitted with a 100mm x 100mm square steel housing, with lockable cover. A copy of the MOE well registration record has been included in Appendix C.

We returned to the site four days following the monitoring well installation to measure the static groundwater level using an interface probe. The interface probe gave a continuous reading in Boreholes 04-1 and 04-3, thereby suggesting that a very thin hydrocarbon film might be present on the surface of the water table in the vicinity of these wells. Groundwater samples were obtained from the monitoring wells after purging the wells of three (3) well volumes of water using dedicated Watera foot valve sampling tubes and placed in amber environmental glassware and VOC vials. Given the potential presence of free (i.e. floating) hydrocarbon product, we again returned to the site on March 1, 2004 and used dedicated disposable Teflon bailers to sample the upper surface of the groundwater contained within the monitoring wells. There was no visible sign of a hydrocarbon sheen and/or layering on any water samples, but samples from Boreholes 04-1 and 04-3 did have an obvious hydrocarbon odour.

The elevation of the ground surface at each borehole location was measured relative to Borehole 04-1, which was provided with an assumed elevation of 100.0m.

Screening of the bagged soil samples for hydrocarbon vapors was done using the headspace method and a Trace-Tector calibrated to Hexane. The headspace readings are recorded on the appended borehole logs (See Appendix A).

### **3.0 SUMMARIZED SUBSURFACE CONDITIONS**

As indicated on the attached borehole logs (Refer to Appendix A), the local soil stratification is as follows:

#### **3.1 Fill**

Fill materials, generally composed of brown silty clay with varying quantities of sand and gravel, were observed in all boreholes to depths ranging from 0.7 to 1.4 m below grade. SPT 'N' values indicate that the cohesionless (i.e. 'sandy') zones are in a 'compact' to 'dense' state, whereas the cohesive (i.e. 'clayey') zones are 'very stiff' to 'hard', although a 'soft' pocket was noted in Borehole 04-3 due to the presence of decayed wood fragments.

There were no unnatural odours associated with any of the fill samples, although some of the wood fragments obtained from Borehole 04-3 had a red stain on their outer surface.

#### **3.2 Silty Clay**

Silty clay materials were present in Boreholes 04-2, 04-4, 04-5, and 04-6 to depths ranging from 1.5 to 1.8m below ground. Visual observation indicates 'traces' of sand

and rootlets, 'some' gravel, and occasional fine silty sand lenses and limestone fragments. SPT 'N' values indicated that the consistency of these materials is 'hard'.

There were no unnatural odours and/or staining associated with any silty clay samples.

### **3.3 Residual Soil**

Residual soils, i.e. completely weathered rock, resembling grey silt clay, were present in all boreholes, with the exception of Borehole 04-4, at depths ranging from 1.4 to 1.8m below ground surface. These soils contain numerous shale and limestone fragments, and are derived from the break-down of the underlying Georgian Bay Formation. SPT 'N' values indicate that the consistency of these soils is 'hard'.

There was no unnatural staining of the residual soil samples, but obvious hydrocarbon odours were associated with those samples obtained from Borehole 04-3 between the 2.0 and 2.6m depths.

### **3.4 Georgian Bay Formation**

Grey to greenish grey shale and limestone was encountered in Boreholes 04-1, 04-2, and 04-3 at depths ranging from 2.1 to 2.6m below ground surface. A more detailed analysis of this bedrock stratum is not possible, given that rock coring was not part of this stage of investigation.



There were no unnatural odours and/or staining associated with the auger spoils taken from bedrock.

#### **4.0 GROUNDWATER**

Groundwater was encountered in Boreholes 04-1, 04-2, and 04-3 just below the bedrock surface. Details of groundwater level measurements are included on the borehole logs (See Appendix A).

The elevation of the groundwater surface, as measured on March 1, 2004, is plotted on Figure No. 2. From this, we surmise that the general groundwater flow direction is south-southeastward.

While no odours were noticed in the groundwater during the drilling operations, hydrocarbon odours were clearly evident in groundwater samples later obtained from the monitoring wells within Boreholes 04-1 and 04-3 on February 23, 2004 and, again, on March 1, 2004.

#### **5.0 ASSESSMENT OF ENVIRONMENTAL SOIL QUALITY**

Selected soil samples from Boreholes 04-1, 04-2, and 04-3 were submitted for environmental chemical analysis in order to determine the concentrations of volatile organic compounds (VOC's), metals, and petroleum hydrocarbons (gas/diesel range). Additional samples from Boreholes 04-1 and 04-2 were subjected to pH testing and a surface soil sample from Borehole 04-6 was submitted for testing against the general and

inorganic MOE Decommissioning Guideline parameters and the inorganic leachate parameters of O-Reg. 558. A list of the tested soil sample locations and test parameters is as follows:

**Location of Soil Samples Submitted for Chemical Analysis**

Soil Sample Location	Environmental Test Criteria					
	VOC's	Metals	pH	Petroleum Hydrocarbons (gas/diesel range)	General and Inorganic Parameters of GUCSO	Inorganic Parameters O.Reg. 558 (Leachate)
BH 04-1, SA 4	x	x	x	x		
BH 04-2, SA 4	x	x	x			
BH 04-2 SA 5	x	x	x			
BH 04-3, SA 3	x			x		
BH 04-3, SA 4	x			x		
BH 04-6, SA 1					x	x

GUCSO – “Guideline for Use at Contaminated Sites in Ontario”, MOE, Rev 1997

As indicated on the attached Tables 1A and 1B, and on the appended laboratory test results (See Appendix B), all of the soil sample test parameters were within the limits set out by MOE in Table ‘B’ of the “Guideline for Use at Contaminated Sites in Ontario (GUCSO)”, Rev. Feb 1997. We have used the Commercial/Industrial Land Use column of Table ‘B’ “Surface Soil and Groundwater Criteria for a Non-Potable Groundwater Condition” since the subject area is serviced by municipal water and is not considered to be a ‘sensitive’ site. Additionally, we have used the parameter concentrations pertaining

to 'coarse-textured' soils due to the fact that gradation analysis was not performed on the soil samples submitted for environmental chemical analysis.

Under strict interpretation of GUCSO, sites where bedrock is encountered at depths less than 2.0m, use of the foregoing so-called Generic Soil Remediation Criteria may not be permissible. For the sake of this preliminary investigation, and in consideration of the fact that the upper bedrock is quite weathered and resembles hard soil, we have used the MOE generic guidelines.

Despite having concentrations below GUCSO Table 'B' limitations, the soil samples from Boreholes 04-1 and 04-3 tested positive for trace concentrations of Toluene, Ethyl benzene, and Xylenes between the 2.3 and 2.7m depth interval. Samples from Borehole 04-3 also tested positive for trace concentrations of Benzene over the same depth interval.

The O. Reg. 558 Leachate Test results (for inorganic parameters) from the surface soil sample obtained from Borehole 04-6 indicates test parameter concentrations below the Schedule 4 criteria and, as such, this soil would be classified as "Non-Hazardous Waste". Additional testing on this same soil sample, however, indicated that copper concentrations were only slightly less than the GUCSO Table 'B' criteria. Additional analysis on soil samples obtained from the same general area as Borehole 04-6 could yield copper concentration in excess of GUCSO Table 'B' criteria.

## 6.0 ASSESSMENT OF GROUND WATER ENVIRONMENTAL QUALITY

Groundwater samples from Boreholes 04-1, 04-2, and 04-3 were submitted for chemical analysis in order to determine pH and the concentrations of VOC's, metals, and petroleum hydrocarbons (gas/diesel range). A listing of groundwater test parameters is as follows:

### Location of Groundwater Samples Submitted for Chemical Analysis

Groundwater Sample Location	Environmental Test Criteria			
	VOC's	Metals	Petroleum Hydrocarbons (gas/diesel range)	pH
BH 04-1	x	x	x	x
BH 04-2	x	x		x
BH 04-3	x		x	

As indicated on the attached Table 2, and on the appended laboratory test results (See Appendix B), the groundwater test samples had concentrations of the tested parameters below the limits set out by MOE in Table 'B' of GUCSO.

Detectable concentrations of gasoline constituents (i.e Benzene, Ethyl Benzene, and Xylenes) were measured in the Borehole 04-1 and 04-3 wells and Benzene was noted in the Borehole 04-2 well. Methyl Ethyl Ketone (MEK) was detected in groundwater sample from all area wells and Acetone was detected in the groundwater samples from the Boreholes 04-2 and 04-3.

## 7.0 DISCUSSION OF RESULTS

From the available soil and groundwater test data, the following conclusions can be drawn:

- The recently removed UST from the neighboring property at 359 Davis Road (currently occupied by Oaktown Auto Collision) may have adversely impacted groundwater beneath the subject site. Given that we have assumed a “Non-Potable Water Condition”, however, the currently measured concentrations of petroleum hydrocarbons within the groundwater do not necessarily require remediation under MOE guidelines. It is quite possible, however, that our monitoring well locations have simply not captured the highest concentration “hydrocarbon plume” from the UST source.
- The surface soil sample from Borehole 04-6 was found to contain copper concentrations very close to the MOE Table ‘B’ GUCSO criteria. While the MOE guidelines were not exceeded in this particular case, that is not to say that other samples from the same general area may not exceed the guidelines.
- The detection of Acetone in the Borehole 04-2 and 04-3 monitoring wells may suggest that (i) the former ‘gasoline’ UST may have been used as a waste solvent holding tank; or, (ii) there may be additional point sources (such as UST’s or surface spills) of solvents in the vicinity of the subject property, which are presently unknown to us. The presence of Acetone within the groundwater samples could also be explained by the presence of a spray painting booth at 359 Davis Road.

- The groundwater flow direction inferred from measurements in the three monitoring wells reveals a very flat hydraulic gradient to the south-southeast. This somewhat lessens the potential concern over 354 Davis Road (Formerly occupied by Ferro Industrial Products) causing cross-boundary impairment of the subject site. Because this gradient is flat, however, it is not inconceivable that northward groundwater flow could occur, for example, via a utility trench connecting the two sites.

## 8.0 RECOMMENDATIONS

In light of the presence of trace concentrations of petroleum hydrocarbon constituents and some volatile organic components in groundwater samples obtained from the three monitoring wells at this site, Phase III subsurface investigation work is warranted in order to better assess the environmental soil and groundwater quality and to determine if the source of these compounds is still in the ground.

As a minimum, we would recommend that several test pits be excavated in the area where the former UST is believed to have been located, as well as in the vicinity of the former paint booth and near the rear doors of the subject building. Sampling and testing of the existing structure for asbestos-containing materials and the examination of soil samples obtained from beneath the floor slab is also recommended, given the building's age and former use as a tire and battery storage facility.

The existing groundwater monitoring well installations should be periodically monitored for water level and the potential presence of free-petroleum product.

We also recommend that MOE files be obtained under the Freedom of Information Act pertaining to the neighboring Ferro Industrial Products Ltd. property.

**GEO-CANADA LTD.**

Jesse Schoor, B.A.Sc.

Scott Peaker, P. Eng.

JS/SMP:sf

DR32/G-04 0106 Phase 2

BOREHOLE WITH WATER MONITORING WELL  
BOREHOLE



SCALE 1:1000

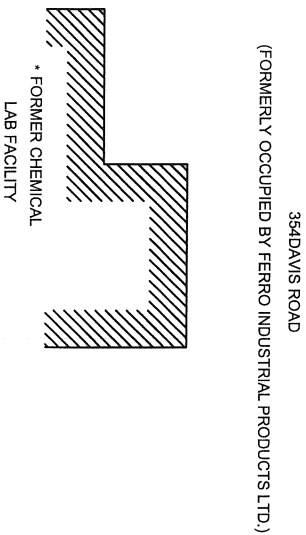
VACANT LAND

VACANT LAND

DAVIS ROAD MUNICIPAL BOOSTER STATION



SOUTH SERVICE ROAD



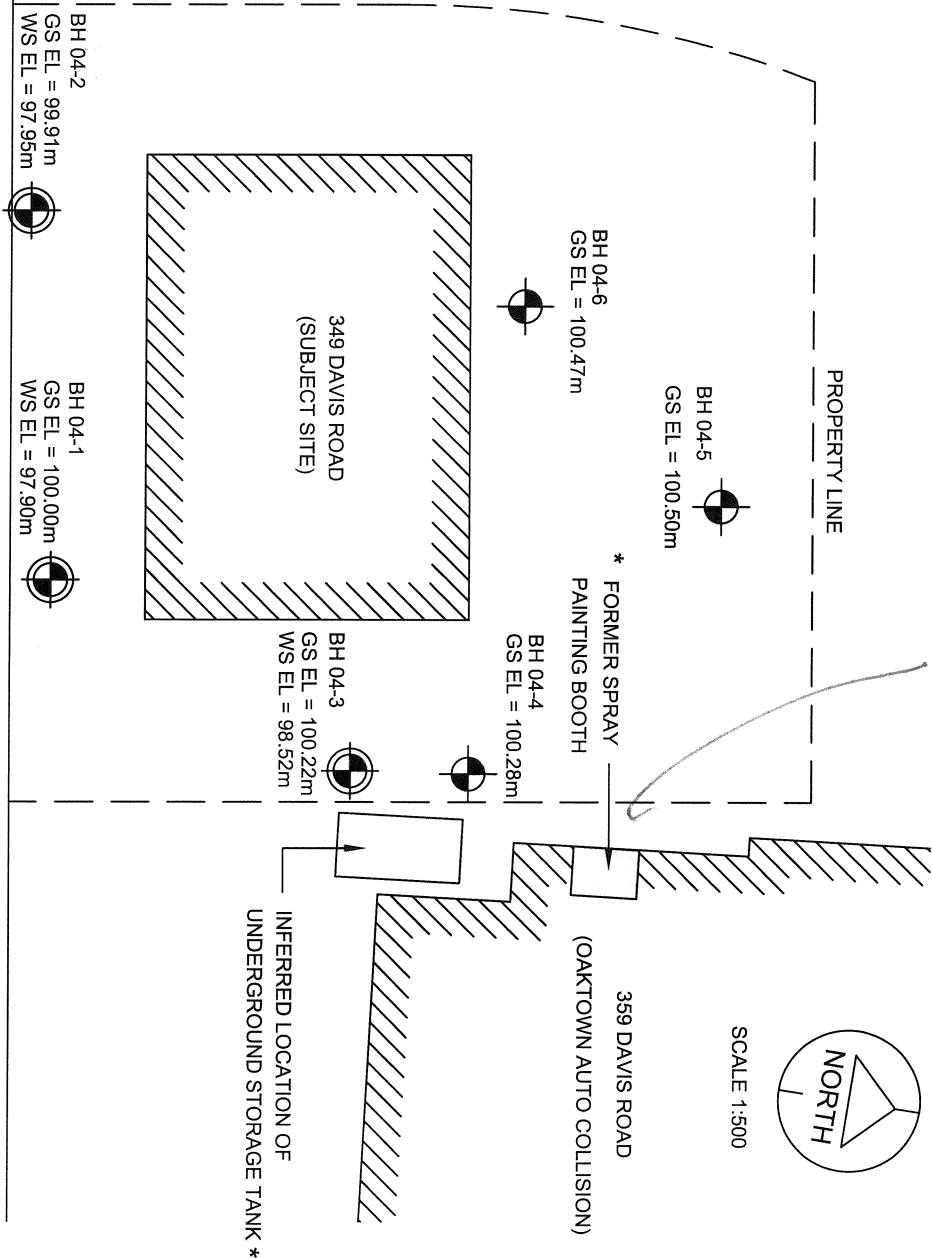
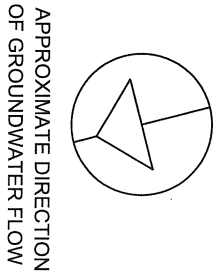
\* THE LOCATIONS OF THESE FORMER FEATURES ARE HIGHLY APPROXIMATE AND HAVE BEEN ESTIMATED FROM FIRE INSURANCE MAPS AND ANECDOTAL INFORMATION



BOREHOLE WITH WATER MONITORING WELL  
 BOREHOLE

G.S. EL. GROUND SURFACE ELEVATION (MARCH 1, 2004)  
 W.S. EL. WATER SURFACE ELEVATION (MARCH 1, 2004)

\* THE LOCATIONS OF THESE FORMER FEATURES ARE HIGHLY APPROXIMATE AND HAVE BEEN ESTIMATED FROM FIRE INSURANCE MAPS AND ANECDOTAL INFORMATION



*Should do another bore hole near paint spray booth*



SCALE 1:500



GEO-CANADA LTD.

349 DAVIS ROAD  
 GROUNDWATER ELEVATION PLAN

FIGURE NO. 2  
 JOB NO. G-04.0106  
 DATE MARCH, 2004

**TABLE 1A: CHEMICAL ANALYSIS RESULTS FOR SOIL SAMPLES**

Test	Test Parameter	Soil Remediation Criteria (ug/g)*	Sample Concentration (ppm)				
			BH 04-1, SA 4	BH 04-2, SA 4	BH 04-2, SA 5	BH 04-3, SA 3	BH 04-3, SA 4
Metals	Barium	1500	48.4	46	50.6		
	Beryllium	1.2	<0.5	<0.5	0.7		
	Boron	2	0.33	0.27	0.6		
	Cadium	12	<1	<1	<1		
	Chromium	750	25.8	19.9	29.4		
	Cobalt	80	15.3	13.6	16.7		
	Copper	225	162	184	173		
	Lead	1000	12.5	10.7	15.4		
	Molybdenum	40	<2	<2	<2		
	Nickel	151	27.6	23.2	30.6		
	Silver	40	<0.3	<0.3	<0.3		
	Vanadium	200	9.7	1.9	14.1		
	Zinc	600	66	59	75		
Gas/Diesel	Petroleum Hydrocarbons (gas/diesel)	1000	<			<	<
VOC's	Vinyl Chloride	0.003	<	<	<	<	<
	Bromomethane	0.061	<	<	<	<	<
	Acetone	3.8	<	<	<	<	<
	Methylene Chloride	140	<	<	<	<	<
	t-1,2-Dichloroethylene	4.1	<	<	<	<	<
	MTBE	120	<	<	<	<	<
	1,1-Dichloroethane	22	<	<	<	<	<
	MEK	38	<	<	<	<	<
	Chloroform	0.79	<	<	<	<	<
	1,1,1-Trichloroethane	26	<	<	<	<	<
	Carbon Tetrachloride	0.1	<	<	<	<	<
	Benzene	5.3	<	<	<	<	0.007
	1,2- Dichloroethane	0.022	<	<	<	<	<
	1,2-Dichloropropane	0.0019	<	<	<	<	<
	Bromodichloromethane	25	<	<	<	<	<
	Cis-1,3-Dichloropropene	0.0066	<	<	<	<	<
	MIBK	58	<	<	<	<	<
	Toluene	34	0.006	<	<	<	0.04
	1,1,2-Trichloroethane	3.1	<	<	<	<	<
	Ethylene Dibromide	0.0056	<	<	<	<	<
	Chlorobenzene	8	<	<	<	<	<
	1,1,1,2- Tetrachloroethane	0.019	<	<	<	<	<
	Ethylbenzene	290	0.007	<	<	<	0.2
Xylenes	34	0.036	<	<	<	0.73	
Styrene	1.2	<	<	<	<	<	
Bromoform	2.3	<	<	<	<	<	
1,1,2,2-Tetrachloroethane	0.037	<	<	<	<	<	
1,3-Diclorobenzene	30	<	<	<	<	<	
1,4-Dichlorobenzene	30	<	<	<	<	<	
1,2-Dichlorobenzene	30	<	<	<	<	<	
PH		N.V.	9.1	9.0	8.8		

Notes: N.V. Denotes "No Value"  
 < Denotes that test parameter was below detection limits  
 Blank values denote that parameter was not tested for that particular sample  
 \* Limits Established by Table B, from GUCSO

**TABLE 1B: CHEMICAL ANALYSIS RESULTS FOR SOIL SAMPLES (CONTINUED)**

Test	Test Parameter	Schedule 4 Criteria (mg/L)	Soil Remediation Criteria (ug/g)*	Sample Concentration (ppm)		
				BH 04-6, SA 1		
O. Reg. 558	Arsenic	2.5		<0.001		
	Barium	100		0.24		
	Boron	500		0.09		
	Cadmium	0.5		<0.005		
	Chromium	5		<0.01		
	Lead	5		<0.02		
	Mercury	0.1		<0.0001		
	(Nitrate-Nitrite)-N	1000		0.84		
	Selenium	1		<0.001		
	Silver	5		<0.005		
Decom. Guidelines	E. C (umhos.cm)		1400	277		
	SAR		12	5.1		
	Arsenic		40	4.3		
	Cadmium		12	<1		
	Chromium (VI)		8	<1		
	Chromium (Total)		750	21.7		
	Cobalt		80	11.5		
	Copper		225	214		
	Lead		1000	15.5		
	Mercury		10	<0.05		
	Molybdenum		40	<2		
	Nickel		150	20.5		
	Boron (HWE)		2	0.66		
	Selenium		10	<1		
	Silver		40	<0.3		
	Zinc		600	52		
	Antimony		40	<1		
Barium		1500	120			
Beryllium		1.2	0.9			
Vanadium		200	47.3			

Notes: N.V. Denotes "No Value"  
 < Denotes that test parameter was below detection limits  
 Blank values denote that parameter was not tested for that particular sample  
 \* Limits Established by Table B, from GUCSO

**TABLE 2: CHEMICAL ANALYSIS RESULTS FOR GROUNDWATER SAMPLES**

Test	Test Parameter	Non-Potable Ground Water Criteria (ug/L)*	Sample Concentration (ppb)				
			BH 04-1	BH 04-2	BH 04-3		
Metals	Barium	23000	131	69			
	Beryllium	53	<0.2	<0.2			
	Boron	50000	318	478			
	Cadium	11	<0.5	<0.5			
	Chromium	2000	<10	<10			
	Cobalt	100	<10	<10			
	Copper	23	2.0	3.0			
	Lead	32	<4	<4			
	Molybdenum	7300	<20	<20			
	Nickel	1600	<20	<20			
	Silver	1.2	<1	<1			
	Vanadium	200	<10	<10			
	Zinc	1000	<10	<10			
Gas/Diesel	Petroleum Hydrocarbons (gas/diesel)	N/V	4000		1500		
VOC's	Vinyl Chloride	0.5	<	<	<		
	Bromomethane	3.7	<	<	<		
	Acetone	3300	<	12	9.1		
	Methylene Chloride	50000	<	<	<		
	t-1,2-Dichloroethylene	100	<	<	<		
	MTBE	50000	<	<	<		
	1,1-Dichloroethane	9000	<	<	<		
	MEK	50000	27	37	40		
	Chloroform	430	<	<	<		
	1,1,1-Trichloroethane	200	<	<	<		
	Carbon Tetrachloride	17	<	<	<		
	Benzene	1900	8.9	0.6	9.8		
	1,2- Dichloroethane	17	<	<	<		
	1,2-Dichloropropane	9.3	<	<	<		
	Bromodichloromethane	50000	<	<	<		
	Cis-1,3-Dichloropropene	3.8	<	<	<		
	MIBK	50000	<	<	<		
	Toluene	5900	1.7	<	3		
	1,1,2-Trichloroethane	16000	<	<	<		
	Ethylene Dibromide	3.3	<	<	<		
	Chlorobenzene	500	<	<	<		
	1,1,1,2- Tetrachloroethane	6	<	<	<		
	Ethylbenzene	28000	1.6	<	6.7		
	Xylenes	56000	6.3	<	13.3		
	Styrene	940	<	<	<		
	Bromoform	840	<	<	<		
1,1,2,2-Tetrachloroethane	22	<	<	<			
1,3-Diclorobenzene	7600	<	<	<			
1,4-Dichlorobenzene	7600	<	<	<			
1,2-Dichlorobenzene	7600	<	<	<			
PH		N.V.	7.7	7.6			

Notes: N.V. Denotes "No Value"  
 < Denotes that test parameter was below detection limits  
 Blank values denote that parameter was not tested for that particular sample  
 \* Limits Established by Table B, from GUCSO



CLIENT: Andrews Carpentry / Contracting  
 PROJECT: Phase I and II ESA  
 LOCATION: 349 Davis Road, Oakville, Ontario  
 DATUM ELEVATION: Assumed  
 BOREHOLE LOCATION: Refer to Figure No. 1

**DRILLING DATA**  
 Method: Solid Stem Augering  
 Diameter: 112mm  
 Date: Feb 19, 2004

REF. NO.: G-04.0106  
 ENCL NO.: 1

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	TOTAL HYDROCARBON CONCENTRATION (FROM HEADSPACE TEST) (ppm)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)								
							20	40	60	80	100	W <sub>p</sub>	W	W <sub>L</sub>		GR SA SI CL
100.0	Ground Surface															
0.0	50mm Asphalt and 300mm Sand and Gravel with occ. cobbles over		1	SS	50										28	
	<b>FILL</b> silty clay and sand with frequent cobbles, brown, dense															
			2	SS	50/ 150mm										24	
98.6																
1.4	<b>RESIDUAL SOIL</b> from shale and limestone of Georgian Bay Formation, resembles silty clay, grey, hard		3	SS	50/ 25mm										16	
97.9																
2.1	<b>GEORGIAN BAY FORMATION</b> grey to greenish grey shale and limestone bedrock		4	SS	50/ 150mm										24	
	Exact nature of bedrock cannot be accurately determined by augering.															
95.4			5	AS	-										-	
4.6	END OF BOREHOLE															
	Date	W. S. El.														
	(m)															
	Upon Completion	97.0														
	Feb 23, 2004	97.9														
	Mar 1, 2004	97.9														

GEO-CANADA ENVIRONMENTAL LOG BH LOGS FOR G-03.0106.GPJ GEO-CANADA TEMPLATE.GDT 11/03/04

GRAPH NOTES +<sup>3</sup>, X<sup>3</sup>: Numbers refer to Sensitivity ○ \*3% Strain at Failure



CLIENT: Andrews Carpentry / Contracting  
 PROJECT: Phase I and II ESA  
 LOCATION: 349 Davis Road, Oakville, Ontario  
 DATUM ELEVATION: Assumed  
 BOREHOLE LOCATION: Refer to Figure No. 1

**DRILLING DATA**  
 Method: Solid Stem Augering  
 Diameter: 112mm  
 Date: Feb 19, 2004

REF. NO.: G-04.0106  
 ENCL NO.: 2

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				TOTAL HYDROCARBON CONCENTRATION (FROM HEADSPACE TEST) (ppm)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)							
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3m			20	40	60	80			100	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT			
99.9	Ground Surface																		
0.0	300mm Topsoil over																		
	<b>FILL</b> sandy silt, some gravel to gravelly, trace to some clay, trace of rootlets, brown, compact	1	SS	12															
99.2																			
0.7	<b>SILTY CLAY</b> some gravel with occ. fine silty sand lenses, trace of rootlets, grey to brownish grey, very stiff	2	SS	23															
98.4																			
1.5	<b>RESIDUAL SOIL</b> from shale and limestone of Georgian Bay Formation, resembles silty clay, grey, hard	3	SS	50/ 100mm															
97.8																			
2.1	<b>GEORGIAN BAY FORMATION</b> grey to greenish grey shale and limestone bedrock  Exact nature of bedrock cannot be accurately determined by augering.	4	SS	50/ 100mm															
97.8																			
97.8		5	SS	50/ 100mm															
97.8																			
97.8		6	AS	--															
95.3																			
4.6	END OF BOREHOLE																		
	Date	W. S. El.																	
	(m)																		
	Upon Completion	97.0																	
	Feb 23, 2004	98.0																	
	Mar 1, 2004	98.0																	

GEO-CANADA ENVIRONMENTAL LOG - BH LOGS FOR G-03.0106.GPJ - GEO-CANADA TEMPLATE.GDT 11/3/04

GRAPH NOTES

+ 3, x 3: Numbers refer to Sensitivity      ○ 8=3% Strain at Failure



CLIENT: Andrews Carpentry / Contracting  
 PROJECT: Phase I and II ESA  
 LOCATION: 349 Davis Road, Oakville, Ontario  
 DATUM ELEVATION: Assumed  
 BOREHOLE LOCATION: Refer to Figure No. 1

**DRILLING DATA**  
 Method: Solid Stem Augering  
 Diameter: 112mm  
 Date: Feb 19, 2004

REF. NO.: G-04.0106  
 ENCL NO.: 3

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W <sub>L</sub>	TOTAL HYDROCARBON CONCENTRATION (FROM HEADSPACE TEST) (ppm)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa) 20 40 60 80 100					
100.2	Ground Surface												
0.0	150mm Sand and Gravel over  FILL silty clay and red-stained wood fragments, brown, soft to very stiff		1	SS	4							100	
			2	SS	22							30	
98.8													
1.4	RESIDUAL SOIL from shale and limestone of Georgian Bay Formation, resembles silty clay, grey, hard  HYDROCARBON ODOURS NOTED BETWEEN 2.0 AND 2.6m		3	SS	50/ 25mm							50	
			4	SS	50/ 100mm							500	
97.6													
2.6	GEORGIAN BAY FORMATION grey to greenish grey shale and limestone bedrock  Exact nature of bedrock cannot be accurately determined by augering.		5	AS	--							35	
95.6													
4.6	END OF BOREHOLE												
	Date (m) Upon Completion Feb 23, 2004 Mar 1, 2004												W. S. El. 97.0 98.2 98.5

GEO-CANADA ENVIRONMENTAL LOG - BH LOGS FOR G-03.0106.GPJ - GEO-CANADA TEMPLATE.GDT 11/3/04

GRAPH NOTES + 3, x 3: Numbers refer to Sensitivity      ○ = 3% Strain at Failure



CLIENT: Andrews Carpentry / Contracting  
 PROJECT: Phase I and II ESA  
 LOCATION: 349 Davis Road, Oakville, Ontario  
 DATUM ELEVATION: Assumed  
 BOREHOLE LOCATION: Refer to Figure No. 1

**DRILLING DATA**  
 Method: Solid Stem Augering  
 Diameter: 112mm  
 Date: Feb 19, 2004

REF. NO.: G-04.0106  
 ENCL NO.: 4

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w <sub>p</sub>	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w <sub>L</sub>	TOTAL HYDROCARBON CONCENTRATION (FROM HEADSPACE TEST) (ppm)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40					
100.3 0.0	Ground Surface  150mm Sand and Gravel over  <b>FILL</b> mixture of silty sand and silty clay, some gravel to gravelly, occ. cobbles, reddish brown, dense / hard		1	SS	51								26	
99.6 0.7	<b>SILTY CLAY</b> trace of rootlets, occ. limestone fragments, grey with green and white laminations, hard		2	SS	38								20	
98.7 1.6	END OF BOREHOLE  Augers grinding at 1.6m  Borehole dry upon completion		3	NR	50/ 25mm								--	

GEO-CANADA ENVIRONMENTAL LOG - BH LOGS FOR G-03.0106.GPJ GEO-CANADA TEMPLATE.GDT 11/03/04

**GRAPH NOTES** +, x, 3: Numbers refer to Sensitivity      ○ = 3% Strain at Failure





CLIENT: Andrews Carpentry / Contracting  
 PROJECT: Phase I and II ESA  
 LOCATION: 349 Davis Road, Oakville, Ontario  
 DATUM ELEVATION: Assumed  
 BOREHOLE LOCATION: Refer to Figure No. 1

**DRILLING DATA**  
 Method: Solid Stem Augering  
 Diameter: 112mm  
 Date: Feb 19, 2004

REF. NO.: G-04.0106  
 ENCL NO.: 5

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	TOTAL HYDROCARBON CONCENTRATION (FROM HEADSPACE TEST) (ppm)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS / 0.3 m	SHEAR STRENGTH (kPa)							
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE				$w_p$ — $w$ — $w_L$				GR SA SI CL	
100.5	Ground Surface														
0.0	150mm Sand and Gravel over  <b>FILL</b> silty clay and sand, trace to some gravel, reddish brown, dense		1	SS	47									46	
99.7															
0.8	<b>RESIDUAL SOIL</b> from shale and limestone of Georgian Bay Formation, resembles silty clay, grey, hard		2	SS	50/ 50mm									10	
98.8															
1.7	<b>SILTY CLAY</b> trace of sand, occ. limestone fragments, grey with red and green laminations, hard		3	SS	88									8	
98.1															
2.4	<b>END OF BOREHOLE</b> Augers grinding at 2.4m Borehole dry upon completion		4	AS	--									--	

GEO-CANADA ENVIRONMENTAL LOG BH LOGS FOR G-03.0106.GPJ GEO-CANADA TEMPLATE.GDT 11/3/04

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ e=3% Strain at Failure



CLIENT: Andrews Carpentry / Contracting  
 PROJECT: Phase I and II ESA  
 LOCATION: 349 Davis Road, Oakville, Ontario  
 DATUM ELEVATION: Assumed  
 BOREHOLE LOCATION: Refer to Figure No. 1

**DRILLING DATA**  
 Method: Solid Stem Augering  
 Diameter: 112mm  
 Date: Feb 19, 2004

REF. NO.: G-04.0106  
 ENCL NO.: 6

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w <sub>p</sub>	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w <sub>L</sub>	TOTAL HYDROCARBON CONCENTRATION (FROM HEADSPACE TEST) (ppm)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)								
							20	40	60	80	100					
100.5 0.0	Ground Surface 200mm Sand and Gravel over <b>FILL</b> silty sand and gravel, trace of organics, dark brown, dense		1	SS	61										18	
100.0 0.5	<b>SILTY CLAY</b> trace of organics in upper 300mm, occ. cobbles, grey with green, white, and oxydized laminations, hard		2	SS	26										18	
98.7 1.8	<b>RESIDUAL SOIL</b> from shale and limestone of Georgian Bay Formation, resembles silty clay, grey, hard		3	SS	87/ 250mm										22	
98.1 2.4	<b>END OF BOREHOLE</b> Augers grinding at 2.4m Borehole dry upon completion		4	AS	--										20	

GEO-CANADA ENVIRONMENTAL LOG - BH LOGS FOR G-03.0106.GPJ - GEO-CANADA TEMPLATE.GDT 11/3/04

GRAPH NOTES

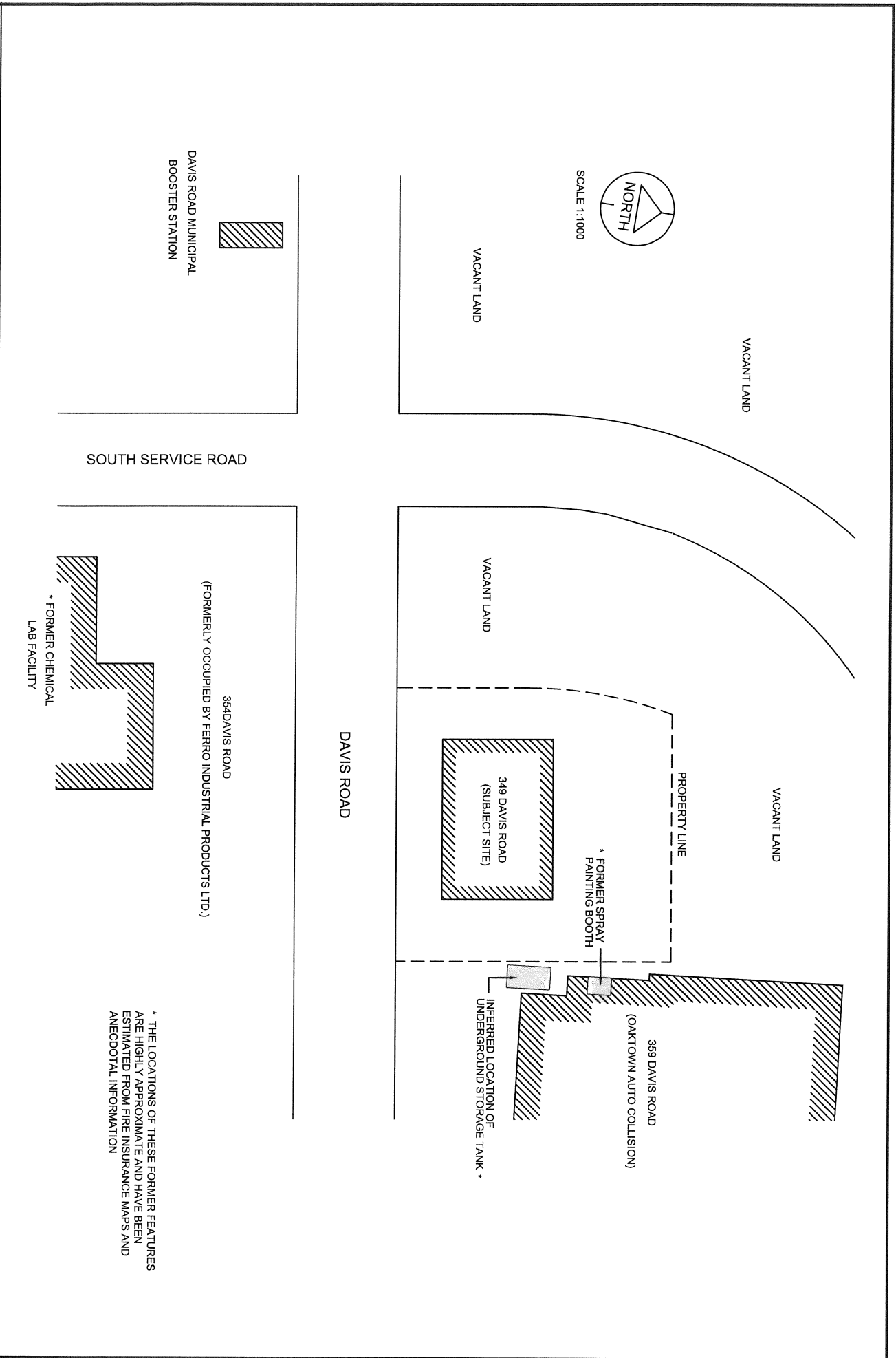
+<sup>3</sup>, ×<sup>3</sup>: Numbers refer to Sensitivity      ○ = 3% Strain at Failure



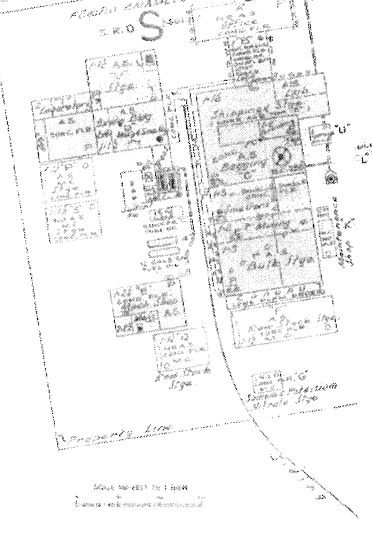
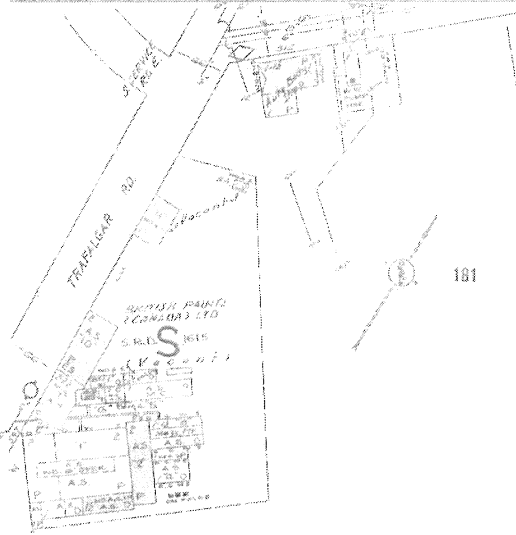
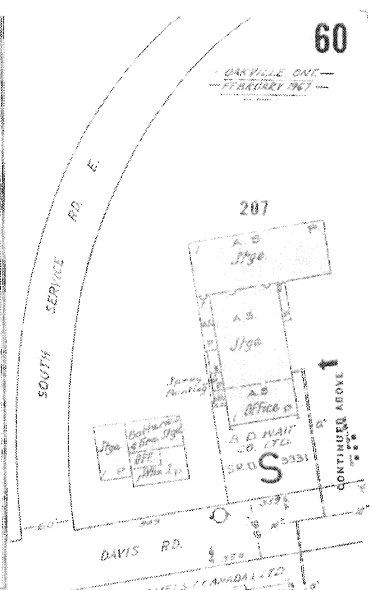
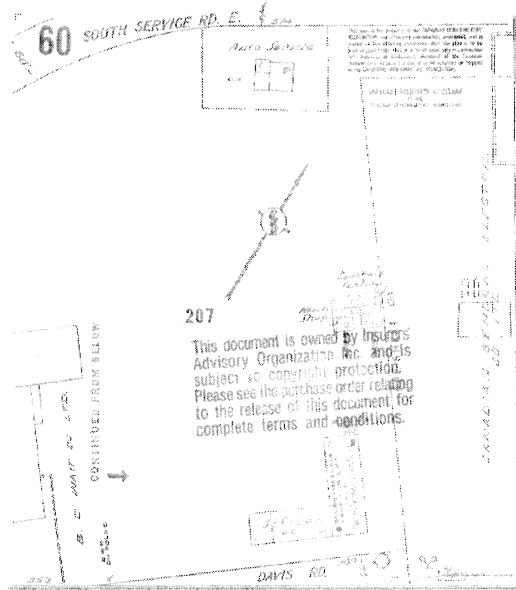
GEO-CANADA LTD.

349 DAVIS ROAD  
LOCATION PLAN

FIGURE NO. 2  
JOB NO. G-04.0106  
DATE MARCH, 2004



\* THE LOCATIONS OF THESE FORMER FEATURES  
ARE HIGHLY APPROXIMATE AND HAVE BEEN  
ESTIMATED FROM FIRE INSURANCE MAPS AND  
ANECDOTAL INFORMATION





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NOT TO SCALE

349 DAVIS ROAD  
AERIAL PHOTOGRAPH FROM 1978

JOB NO.  
DATE

G-04.0104  
FEBRUARY, 2004



NOT TO SCALE

349 DAVIS ROAD  
AERIAL PHOTOGRAPH FROM 1954

JOB NO.  
DATE

G-04.0106  
FEBRUARY, 2004