

**DELINEATION OF CONTAMINATED SOILS PROGRAM
FORMER CROWN ELECTRIC SITE
17 SYDENHAM STREET
BRANTFORD, ONTARIO**

Submitted to:

City of Brantford
100 Wellington Square
Brantford, Ontario
N3T 2M3

Submitted by:

AMEC Earth & Environmental,
A Division of AMEC Americas Limited
325 West Street, Suite A201
Brantford, Ontario
N3R 3V6

November 24, 2005

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EXECUTIVE SUMMARY

AMEC Earth & Environmental ('AMEC') was retained by the Corporation of the Brantford ('City of Brantford') to delineate the extent of the heavy metal, polycyclic aromatic hydrocarbon (PAH) and petroleum hydrocarbon (F1 to F4) impacted soils at the former Crown Electric property located at 17 Sydenham Street in Brantford, Ontario (herein referred to as the 'Site').

The City of Brantford retained AMEC to delineate the extent of the soil contamination and formulate an approximate cost estimate to remediate the above noted brownfield Site. The need to complete this investigation was identified in AMEC's reports entitled "Draft Phase I and II Environmental Site Assessment" dated February 11, 2005 and "Underground Storage Tank Removal Program" dated July 13, 2005. In these reports the following significant verbatim environmental results were provided:

Phase I ESA

- "The Site is currently vacant, but was formerly occupied by Crown Electric Manufacturing Co. Ltd. ('Crown Electric'). Major operations at the Site included the manufacturing of lighting fixtures, portable table lamps and brass art. According to historical documentation, Crown Electric occupied the Site since its development for industrial use in approximately 1910.
- The city directories indicate the Site has been in industrial land use since 1910. Occupants at the Site (17-21 Sydenham Street) have included: Crown Electrical Manufacturing Co.; Harold's Haulage, Fab Print Co., Can-Wear Casuals and Brantford Refrigeration Co.
- The 1965 FIP shows a buffing, plating and finishing area located in the southern portion of Building 1 on-Site. The FIP also shows an underground fuel oil storage tank located in the northeastern portion of the Site.
- The 1969 Property Underwriters Plan shows a 37,854 L (10,000 gallon) underground storage tank (UST) located on the eastern portion of the Site. The Site plan indicates the UST was not in use.

Phase II ESA

- The inferred groundwater flow direction on-Site is to the west.
- The reported soil cadmium concentrations of 28.5 µg/g and 58.6 µg/g in the samples from BH104 and BH106 exceed the Table 3 criteria of 12 µg/g for all land uses.

Similarly, the reported soil copper concentrations of 3,690 µg/g (BH104) and 4,470 µg/g (BH106) exceed the Table 3 criteria of 300 µg/g for all of the potential land uses. The reported zinc soil concentrations of 7,040 µg/g (BH104) and 6,250 µg/g (BH106) exceed the Table 3 criteria of 800 µg/g for all land uses.

- The reported lead concentrations in BH104 and BH106 of 502 µg/g and 573 µg/g respectively, are above the Table 3 criteria of 200 µg/g for residential/parkland/institutional land uses.
- The laboratory results reported toluene and PAH concentrations below the MOE Table 3 criteria for all land uses.
- No detectable concentration of PCBs was reported in the soil sample submitted from BH106.
- The heavy metal groundwater concentrations reported in MW103 and MW105 are below the applicable MOE Table 3 criteria.
- The reported polycyclic (PAH) and volatile organic compounds (VOCs) groundwater concentrations in MW101, MW103, MW105 and Geomatrix MW1 were below the applicable MOE Table 3 criteria.
- A UST located in the northeastern portion of the Site was observed to be full of oily water. Approximately 5 cm of sludge was observed at the bottom of the UST. The UST measured approximately 2.4 m in diameter by 7.5 m in length. Minor corrosion and perforations were observed on the top of the UST. Chemical analysis of the oily water confirms the presence of elevated petroleum hydrocarbons in the F2 and F3 range. In addition, suspended oily coagulates in the water sample were confirmed to be bunker oil.

UST Removal Program

- AMEC supervised the excavation of an out-of-service 35,000 L (10,000 gallon) UST which contained a mixture of "Bunker C" sludge and oily water from the northeastern portion of the Site on March 7, 17 and 18, 2005.
- In total 34,277 L of oily water and 7.79 tonnes of sludge were removed from the UST and disposed of off-Site at licensed PSC waste disposal facilities.
- The cleaned UST and associated piping was shipped off-Site to a metal recycling plant by Chute Construction.

- The excavation was backfilled using surplus native on-Site materials.
- During the confirmatory soil sampling, black oily staining was observed from a depth of 2.1 to 2.4 m bgs along the western wall of the excavation. This staining was observed to be approximately 1.8 m in length across the wall of the excavation. The soil sample collected from this area of the west wall exceeds the Table 3 criteria for all land-use criteria for TPH (F1, F2, F3 and F4) and benzo-a-pyrene.
- Reported TPH (F1 –F4) concentrations of soil samples identified as East Wall, South Wall, South Floor, Middle Floor and North Floor were less than Table 3 criteria for residential/ institutional/ parkland and industrial/commercial/community land-uses.”

Based on the presence of the above noted contamination, AMEC supervised the advancement of twelve additional boreholes on July 28, 2005 using a truck-mounted drill rig that was owned and operated by Aardvark Drilling Inc. of Guelph, Ontario. These boreholes were advanced to a depths ranging between 3.1 and 3.6 m below ground surface elevation to delineate the extent of the previously identified contaminated soils.

Since the end use of this property has not been determined, the soil chemistry results were compared to both the residential/parkland/institutional and industrial/commercial/community criteria found in Table 3 of the MOE's document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*", March 2004 for land-use in non-potable ground water situations. Non-potable ground water criteria were considered to be the most appropriate since the City of Brantford derives its raw municipal water from the Grand River.

The significant findings of this delineation program include:

- No detectable concentrations of the PAH, TPH fractions (F1 - F4) and BTEX parameters were reported in the soil chemistry results.
- The reported antimony concentrations of 62 µg/g in BH202 (0.6 to 1.2 m), 18 µg/g in BH211 (0 to 0.6 m) and 95 µg/g in BH211 (1.2 to 1.8 m) exceed the Table 3 criterion for residential and industrial land uses of 13 µg/g. In addition, the reported antimony concentrations from BH202 (0.6 m to 1.2 m) and BH211 (1.2 to 1.8 m) also exceed the industrial/commercial/community criteria of 40 µg/g.
- The reported arsenic concentrations of 29 µg/g in BH201 (1.2 to 1.8 m) and 24 µg/g in BH207 (0 to 0.6 m) exceed the Table 3 criterion residential/parkland/institutional land use of 20 µg/g. In addition, the reported arsenic concentrations of 180 µg/g in BH208 (0 to 0.6 m), 48 µg/g in BH209 (0.6 to 1.2 m), 200 µg/g in BH211 (0 to 0.6 m) and 1400 µg/g in BH211 (1.2 to 1.8 m) exceed the Table 3 criterion for both

residential/parkland/institutional and industrial/commercial/community land uses of 20 $\mu\text{g/g}$ and 40 $\mu\text{g/g}$, respectively.

- The reported beryllium concentration of 1.3 $\mu\text{g/g}$ in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 1.2 $\mu\text{g/g}$.
- The reported cadmium concentrations of 780 $\mu\text{g/g}$ in BH208 (0 to 0.6 m) and 16 $\mu\text{g/g}$ in BH208 (0.6 to 1.2 m) exceed the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 12 $\mu\text{g/g}$.
- The reported chromium vi concentration of 168 $\mu\text{g/g}$ in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 8 $\mu\text{g/g}$.
- The reported total chromium concentration of 1200 $\mu\text{g/g}$ in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 750 $\mu\text{g/g}$.
- The reported copper concentrations of 3800 $\mu\text{g/g}$ in BH202 (0.6 to 1.2 m), 2100 $\mu\text{g/g}$ in BH207 (0 to 0.6 m), 3200 $\mu\text{g/g}$ in BH208 (0 to 0.6 m), 390 $\mu\text{g/g}$ in BH208 (0.6 to 1.2 m), 610 $\mu\text{g/g}$ in BH206 (0.6 to 1.2 m), 400 $\mu\text{g/g}$ in BH211 (0 to 0.6 m), and 3500 $\mu\text{g/g}$ in BH211 (1.2 to 1.8 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 225 $\mu\text{g/g}$.
- The reported lead concentrations of 410 $\mu\text{g/g}$ in BH202 (0.6 to 1.2 m), 490 $\mu\text{g/g}$ in BH207 (0 to 0.6 m) exceed the Table 3 criterion residential land use of 200 $\mu\text{g/g}$. The reported lead concentration of 7000 $\mu\text{g/g}$ in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 1000 $\mu\text{g/g}$.
- The reported nickel concentrations of 180 $\mu\text{g/g}$ in BH207 (0 to 0.6 m) and 780 $\mu\text{g/g}$ in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both /parkland/institutional and industrial/commercial/community land use of 150 $\mu\text{g/g}$.
- The reported zinc concentrations of 4100 $\mu\text{g/g}$ in BH202 (0.6 to 1.2 m) and 2300 $\mu\text{g/g}$ in BH207 (0 to 0.6 m) and 2600 $\mu\text{g/g}$ in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both /parkland/institutional and industrial/commercial/community land use of 600 $\mu\text{g/g}$.

- Sample BH302 (0.6 to 1.2 m) was a field duplicate of BH202 (0.6 to 1.2 m) submitted for chemical analysis of heavy metals, chromium vi, pH, EC and SAR. Good correlation was reported in the soil chemistry results between these two samples. Sample BH310 (1.8 to 2.4 m) was a field duplicate of BH210 (1.8 to 2.4 m) submitted for chemical analysis of PAHs, TPH fractions (F1-F4), and BTEX. No detectable concentrations were reported in these two samples for all parameters evaluated.

Based on AMEC's review of the soil chemistry results, the heavy metals contamination appears to be associated with the fill material that was encountered in the first 1.8 m and is spatially distributed in three areas of the Site. In addition, a minor petroleum hydrocarbon (F1 to F4) and PAH exceedance was reported in the UST confirmatory soil sampling programs. These areas of contamination are shown on Figure 2.

Two potential remedial strategies are presented for Site redevelopment. The first strategy involves the excavation and off-Site disposal of the estimated 9,500 tonnes of contaminated soils on-Site. For the purpose of this cost estimate, AMEC assumed the Site clean-up would occur simultaneously with re-development of the Site for residential purposes. Under this assumption restoration of the excavated areas were not included in the cost estimate. The provided a ballpark cost estimated remedial cost of \$475,000.00 to 593,750.00 (excluding GST) based on the remediation of 9,500 tonnes of solid non-hazardous waste. It should be noted that AMEC has not confirmed if the soils at the Site meet the non-hazardous criteria.

The second option considers remediating only the most heavily contaminated soils and completing a Risk Assessment (RA) on the remainder of the property. This assumption assumes that the Site will continue in either industrial or commercial land-use. Based on this assumption, a limited soil remediation program south of the former Buffing and Plating operations in the vicinity of BH208 and BH211 will occur. The remediation will include excavation and off-Site disposal of all chromium VI, PAH and petroleum hydrocarbon (F1 to F4) impacted soil. This assumption is based on the excavation and off-Site disposal of 1,500 tonnes of impacted soil; restoration of the excavation; and, the completion of a RA on the remainder of the contaminated soils. AMEC estimates the costs associated with the partial clean-up with RA to meet industrial/commercial/community land-use to be \$165,000.00 (excluding GST).

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1.0 INTRODUCTION

AMEC Earth & Environmental ('AMEC') was retained by the Corporation of the Brantford ('City of Brantford') to delineate the extent of the heavy metal, polycyclic aromatic hydrocarbon (PAH) and petroleum hydrocarbon (F1 to F4) impacted soils at the former Crown Electric property located at 17 Sydenham Street in Brantford, Ontario (herein referred to as the 'Site').

AMEC has been involved with this Site since November, 2004 after a fire destroyed most of the Site building. AMEC assisted the City of Brantford in the identification of hazardous building materials which would require special handling prior to demolishing the Site building. The significant findings of this investigation were included in our report entitled "Designated Substance Survey" (DSS) Reference No. SW0041101 dated November 22, 2004.

Subsequent to the completion of the DSS, AMEC was retained by the City of Brantford to conduct a Phase I and II Environmental Site Assessment at the above noted Site. The findings of this assessment were included in our "Draft Phase I and II Environmental Site Assessment", dated February 14, 2005 (Reference Number SW0041204). During the Phase I and II ESA it was confirmed that a 34,277 L (10,000 gallon) underground storage tank (UST) existed on-Site. This UST was removed from the Site in March, 2005. The findings of the UST removal program are documented in AMEC's report entitled "Underground Storage Tank Removal Program" (Reference No. SW0050206), dated July 13, 2005. The Phase II ESA also identified the presence of heavy metals impacted soils on-Site. To delineate the vertical and horizontal extent of the heavy metals contamination on-Site, the Soil Delineation Program was conducted.

A summary of the above noted previous environmental investigations is provided below.

1.1 AMEC'S Designated Substance Survey

AMEC conducted the DSS on November 12, 2004. During this survey, all accessible areas of the building were examined. The southern portion of the building was deemed inaccessible due to infrastructure safety concerns and burned construction debris resulting from the fire on Site. Bulk samples of building materials suspected of containing asbestos and paint chip and/or bulk samples suspected of containing lead ('UFFI') were collected for analysis.

Materials known to containing asbestos were not sampled. Therefore, during the Site visit, cementitious mud fittings and transite pipes known to be asbestos containing were not sampled. In total, 14 samples of suspected asbestos-containing materials were submitted to AMEC's Phoenix, Arizona laboratory for analysis. Each sample was analysed using polarized light microscopy (PLM) technique (following method EPA/600/R-93/116). This analytical procedure

follows the Ontario Ministry of Labour "Code for the Determination of Asbestos from Bulk Samples" dated August 23, 1985.

The findings of the asbestos sampling program indicated, asbestos containing cementitious fittings were present in the boiler room and warehouse area of the building. Similarly, a 21 m length of transite pipe was observed along the west wall on the second storey of the building. It was recommended that these materials should be removed in accordance with O.Reg.104/04 prior to the demolition of the Site building. Mr. Shaun Weale from Inland Insulations Ltd. provided AMEC with a copy of the Weigh Bills documenting the volumes of asbestos removed from the Site from November 26 through December 4, 2004. In total, 0.8 tonnes (800 kg) of asbestos containing debris was removed from the Site using Type II outdoor procedures.

One paint sample suspect to be lead containing was submitted to the PSC analytical laboratory in Mississauga, Ontario laboratory for analysis. The sample was subsequently analysed using flame atomic absorption spectroscopy (F.A.A.S.). The laboratory results of the paint sample analyzed indicated a lead concentration of 538 ug/g (ppm). This lead concentration is less than the criteria established by the U.S. HUD of 5,000 ppm.

1.2 AMEC's Draft Phase I and II ESA Report

Significant Phase I ESA Findings- Site

- "The Site is currently vacant, but was formerly occupied by Crown Electric Manufacturing Co. Ltd. ('Crown Electric'). Major operations at the Site included the manufacturing of lighting fixtures, portable table lamps and brass art. According to historical documentation, Crown Electric occupied the Site since its development for industrial use in approximately 1910.
- The city directories indicate the Site has been in industrial land use since 1910. Occupants at the Site (17-21 Sydenham Street) have included: Crown Electrical Manufacturing Co.; Harold's Haulage, Fab Print Co., Can-Wear Casuals and Brantford Refrigeration Co.
- The 1915 FIP shows Building 4 as being used as a foundry on-Site. Machine, polishing, manufacturing and plating areas are shown in Building 2. In addition, the 1915 FIP shows a one storey transformer house located in the southern portion of the Site. Based on the 1950 FIP, Building 1 included assembly; shipping; machine shop and office areas.

- The 1965 FIP shows a buffing, plating and finishing area located in the southern portion of Building 1 on-Site. The FIP also shows an underground fuel oil storage tank located in the northeastern portion of the Site.
- The 1969 Property Underwriters Plan shows a 37,854 L (10,000 gallon) underground storage tank (UST) located on the eastern portion of the Site. The Site plan indicates the UST was not in use.
- The 1990 PUR indicates the occupants of the Site included a metal grinding company, rubber tire warehouse and vacant areas.
- The PUR dated 1990 also indicates Burgess Power Train and Manufacturing, a metal grinding operation as the occupants of the first floor in Building 2. This area included a dip tank and conveyor system. According to the PUR, the dip tank contained a water based solution.
- An environmental Site assessment conducted by McGlone and Associates in 1994 provided the following Site related information: on-Site operations consisted of plating, soldering, metal finishing, painting and foundry; a tire recycling business operated on Site; the property immediately northwest of the Site was occupied by Northern Globe, an asphalt roofing manufacturer; the property located immediately northeast of the Site has been occupied with various industrial operations since at least 1893; the properties located west and southwest of the Site were occupied by a coal yard for approximately 40-50 years; and the MOE indicated that low concentrations of trichloroethylene in the groundwater were detected on the Northern Globe property.
- Based on the results of the Phase II ESA conducted on-Site by Geomatrix in 2004, PAH concentrations which exceed the former MOE Table B criteria found in the document entitled, "Guidelines for Use at Contaminated Sites in Ontario", Revised February 1997 were detected in one groundwater sample collected from groundwater monitoring well identified as MW1.
- The MOE document entitled, "Inventory of Industrial Sites Producing or Using Coal Tar and Related Tar in Ontario", dated November 1988, indicates the Brantford Roofing Co. was located west of the Site at 22 Sydenham Street. The plant was in operation from approximately 1906-1950's. The document indicates the Brantford Roofing Co., and later, Murray Brantford Ltd. and Domtar Construction Materials manufactured roofing products consisting of roofing felts and tarred paper. It also indicates that an FIP dated 1912 showed tar melting tanks and underground concrete tanks that were likely used for fuel and/or tar storage on this property.

- Based on the results of AMEC's DSS conducted in November, 2004, asbestos containing fittings and transite piping were observed in the Site building. In addition, one paint sample was collected from the Site building. The laboratory results of the paint sample analyzed indicated a lead concentration of 538 ug/g (ppm). This lead concentration is less than the criteria established by the U.S. HUD of 5,000 ppm. AMEC the asbestos containing materials be removed in accordance with O.Reg.104/04 prior to the demolition of the Site building.
- In addition, during AMEC's DSS in December, 2004, two pits were observed in the southern and western portions of the Site building. These pits were observed to contain oily water and debris. During the Phase I ESA Site inspection, it was noted that these pits had been filled with construction debris (bricks). A subsequent letter report issued by AMEC on December 14, 2004, confirms the asbestos containing material were removed in accordance with applicable regulations.

Significant Phase I ESA Findings-Surrounding Properties

- The 1982 aerial photograph shows the following: a large industrial shaped building and tanks on the property west of the Site; and industrial shaped structures north of the Site followed by railway lines.
- The city directories indicate the property south of the Site was occupied by a coal yard from approximately 1900 to 1945. The city directories also indicate the properties west and north of the Site have been occupied for industrial land use by Brantford Roofing Co., Monarch Tractor Ltd., Sherer Gilette Co. Ltd., HD Power Train, Murray Brantford Ltd. and Domtar Construction Materials from approximately 1916 to the early 1990's. Northern Globe occupied the property located southwest of the Site from approximately 1991 to 1997.
- The 1915 FIP shows a coal and wood yard located immediately southwest of the Site. The FIP also shows Brantford Roofing Co. located northwest of the Site. This property included warehouses, tar melting areas and USTs.
- The FIP dated 1950 shows Brantford Refrigeration Ltd. located north of the Site. On site operations included: painting; spraying; drying; welding; and parts assembly.
- The 1950 FIP shows Brantford Roofing Co. as the occupants of the property northwest of the Site. This property included warehouse storage, emulsion and manufacturing of roofing materials. It also included eleven USTs containing gasoline, asphalt, soap, lapping and solvent and five ASTs containing asphalt.

- The 1965 FIP shows Domtar Construction Material Ltd. and Murray Brantford Plant located northwest and west of the Site, respectively. This property included: one gasoline UST; five solvent USTs; one naphtha UST (5,000 gallons); one asphalt UST (12,000 gallons); four asphalt ASTs (10,000 gallons); one fuel oil AST; three asphalt ASTs; fuel oil UST; and a limestone AST (125 tonnes). The majority of these tanks were located in the central portion of the property. This property included such operations as: manufacturing, finishing, asphalt production and emulsion.”

Significant Phase II ESA Findings

Based on the above noted Phase I ESA findings, AMEC conducted a Phase II ESA, consisting of a soil and groundwater investigation across the Site and test pit program in the vicinity of the UST. On January 18, 2005, AMEC mobilized a truck-mounted drill rig machine to the Site to advance seven boreholes on-Site. The boreholes were identified as MW101, BH102, MW103, BH104, MW105, BH106 and BH107. Three of the seven boreholes were installed with groundwater monitoring wells. The monitoring wells were purged and sampled on January 21, 2005. In addition, MW1 advanced by Geomatrix in 2004, was purged and sampled on January 21, 2005.

The results of the chemical analysis for the soil and groundwater samples submitted to the laboratory were evaluated against the coarse textured soil and groundwater remediation criteria for residential/institutional/parkland and industrial/commercial/community property use in a non-potable groundwater situation, as referenced in Table 3 of the MOE's document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*", March 2004. AMEC compared the chemical analysis to both land-use criteria to aid the City of Brantford when considering future redevelopment opportunities for the Site.

On the basis of our Phase II ESA and Tank Investigation, AMEC provides the following conclusions:

- The inferred groundwater flow direction on-Site is to the west.
- The reported soil cadmium concentrations of 28.5 µg/g and 58.6 µg/g in the samples from BH104 and BH106 exceed the Table 3 criteria of 12 µg/g for all land uses. Similarly, the reported soil copper concentrations of 3,690 µg/g (BH104) and 4,470 µg/g (BH106) exceed the Table 3 criteria of 300 µg/g for all of the potential land uses. The reported zinc soil concentrations of 7,040 µg/g (BH104) and 6,250 µg/g (BH106) exceed the Table 3 criteria of 800 µg/g for all land uses.

- The reported lead concentrations in BH104 and BH106 of 502 µg/g and 573 µg/g respectively, are above the Table 3 criteria of 200 µg/g for residential/parkland/institutional land uses.
- The laboratory results reported toluene and PAH concentrations below the MOE Table 3 criteria for all land uses.
- No detectable concentration of PCBs was reported in the soil sample submitted from BH106.
- The heavy metal groundwater concentrations reported in MW103 and MW105 are below the applicable MOE Table 3 criteria.
- The reported polycyclic (PAH) and volatile organic compounds (VOCs) groundwater concentrations in MW101, MW103, MW105 and Geomatrix MW1 were below the applicable MOE Table 3 criteria.
- A UST located in the northeastern portion of the Site was observed to be full of oily water. Approximately 5 cm of sludge was observed at the bottom of the UST. The UST measured approximately 2.4 m in diameter by 7.5 m in length. Minor corrosion and perforations were observed on the top of the UST. Chemical analysis of the oily water confirms the presence of elevated petroleum hydrocarbons in the F2 and F3 range. In addition, suspended oily coagulates in the water sample were confirmed to be bunker oil.
- The scope of work reflects a reasonable effort to further define the environmental condition of the Site, and whether the need for remedial work exists. However, the Phase I/II ESA undertaken by AMEC will not serve to "warrant" or "certify" the environmental condition of the subject property, given that the environmental condition of soil may vary between sampling locations. Should a "Record of Site Condition" be required under O. Reg 154/04 by the municipality, an additional subsurface investigation may be required.

Based on the findings of the Phase I and II ESA completed on-Site, the following recommendations were made:

- The UST should be emptied and removed from the Site by a licensed contractor in accordance with applicable regulations. Upon removal of the UST, confirmatory soil samples should be collected to confirm the presence/absence of impact due to the former use of this UST on Site.

- Delineation of the lateral and vertical extent of the heavy metals contamination in the soils in the vicinity of BH104 and BH106 should be conducted. Once the heavy metal impacted soil has been delineated, the soils should be excavated and disposed of off-Site in a licensed landfill site as per Ontario Regulation 558/00. Upon completion of the excavation of the impacted soils, confirmatory soil samples should be collected to confirm the remedial activities are complete.

1.3 AMEC's Underground Storage Tank Removal Program

On January 26, 2005, AMEC mobilized an excavator owned and operated by Chute's Construction to the Site to excavate the soils in the vicinity of the UST shown on the plan. During this investigation it was confirmed that a UST is present on-Site. The UST was observed to be full of oily water and sludge. The UST measured approximately 2.4 m in diameter by 7.5 m in length. Minor corrosion and perforations were observed on the top of the UST. A sample of the oily water and sludge was collected from the tank and submitted to a CAEAL certified laboratory for analysis of petroleum hydrocarbon fingerprinting and confirmed to contain Bunker "C" oil.

On March 7, 2005, AMEC mobilized to the Site to supervise the UST removal activities. Chutes Construction and PSC were retained as the contractors to complete the UST removal activities. The top of the UST was exposed and approximately 34,277 L of oily water was removed from the UST by a Wet VacTrain vacuum truck.

Based on the scope of work conducted, the chemical parameters evaluated and the provincial guideline criteria selected, and the analytical results the following conclusions are presented:

- AMEC supervised the excavation of an out-of-service 35,000 L (10,000 gallon) UST which contained a mixture of "Bunker C" sludge and oily water from the northeastern portion of the Site on March 7, 17 and 18, 2005.
- In total 34, 277 L of oily water and 7.79 tonnes of sludge were removed from the UST and disposed of off-Site at licensed PSC waste disposal facilities.
- The cleaned UST and associated piping was shipped of off-Site to a metal recycling plant by Chute Construction.
- The excavation was backfilled using surplus native on-Site materials.
- During the confirmatory soil sampling, black oily staining was observed from a depth of 2.1 to 2.4 m bgs along the western wall of the excavation. This staining was observed to

be approximately 1.8 m in length across the wall of the excavation. The soil sample collected from this area of the west wall exceeds the Table 3 criteria for all land-use criteria for TPH (F1, F2, F3 and F4) and benzo-a-pyrene.

- Reported TPH (F1 –F4) concentrations of soil samples identified as East Wall, South Wall, South Floor, Middle Floor and North Floor were less than Table 3 criteria for residential/ institutional/ parkland and industrial/commercial/community land-uses.

Based on the findings, the following recommendations can be made:

- AMEC recommends that the TPH and benzo(a)pyrene identified on the west wall of the UST excavation wall be excavated and disposed of off-Site at a licensed landfill site in accordance with O.Reg.558/00. Upon completion of the remedial activities, confirmatory soil samples should be collected from the excavation and submitted for chemical analysis to confirm the TPH remediation is complete.

2.0 TERMS OF REFERENCE

2.1 Scope of Work

Based on the findings of the Draft Phase I and II ESA completed on-Site, the following scope of work has been designed to delineate the lateral and vertical extent of heavy metal and PAH impacted soils on-Site:

- AMEC arranged for the location of natural gas pipelines, stormwater and sanitary sewers, and telephone and electrical conduits, prior to sub-surface drilling operations by private and municipal locating services.
- AMEC drilled eleven boreholes in the vicinity of BH104, BH106, BH107 and the former UST excavation as a means of assessing the lateral and vertical extent of heavy metals and PAH impacted soils in these areas. One borehole was advanced in the vicinity of former underground storage tank to delineate the horizontal extent of hydrocarbon impacted soils identified during the tank removal program. Since elevated ground water concentrations were not identified in the Phase II ESA previously completed on-Site, a ground water assessment has not been included in the delineation program.
- AMEC obtained soil samples from the drilled boreholes. Selected soil samples were analyzed for the following parameters: heavy metals, chromium VI, petroleum hydrocarbon fractions (F1 - F4), benzene, toluene, ethylbenzene, xylenes (BTEX), polynuclear aromatic hydrocarbons (PAHs), electrical conductivity (EC) and sodium absorption ratio (SAR). Soil types will be examined and logged; and soil samples will be collected in accordance with MOE standards.
- Laboratory analyses of all samples were conducted by a laboratory that is accredited/certified by the Canadian Association for Environmental Analytical Laboratories ('CAEAL');
- AMEC compared the analytical testing results to the Ministry of Environment's "Part XI.1 of the Environmental Protection Act (EPA) Record of Site Condition Regulation 153/04" March, 2004. The regulation will provide assessment criteria; and,
- AMEC prepared a report that documented the findings the borehole delineation program and included the results of the analytical testing of the soil/fill material, and any possible requirement for remedial activities.

3. FIELD PROGRAM METHODOLOGY

The methodology used during the Soil Delineation Program is presented below.

3.1 Borehole Drilling

On July 28, 2005 AMEC supervised the advancement of twelve boreholes using a truck-mounted drill rig that was owned and operated by Aardvark Drilling Inc. of Guelph, Ontario. The boreholes were advanced to a depths ranging between 3.1 and 3.6 m below ground surface elevation. The locations of these boreholes are presented in Figure 1, with the rationale for the locations summarized below:

- BH201 was advanced within the western portion of the former building footprint area. This borehole was located northwest of borehole BH104, in which, cadmium, copper, lead and zinc impacted soils were identified during the Phase II ESA. Similarly, BH202 was advanced northeast and BH203 was advanced southeast of BH104;
- BH208 was advanced south of former building footprint area. This borehole was located west of borehole BH106, in which, cadmium, copper, lead and zinc impacted soils were identified during the Phase II ESA. Similarly, BH207 was advanced east of BH106 and BH209 was advanced northeast of BH106 and within the former building footprint;
- BH205 was advanced south of former building footprint and in the southwest portion of the Site. This borehole was located northwest of borehole BH107, in which, copper impacted soils were identified during the Phase II ESA. Similarly, BH204 was advanced west and BH206 was advanced southeast of BH107;
- BH211 was advanced in the central portion of the former building footprint area to further delineate the extent of heavy metal impacted soils in this portion of the Site;
- BH212 was advanced in the eastern portion of the former building footprint area to further delineate the extent of heavy metal impacted soils; and
- BH210 was advanced west of the former underground storage tank location to delineate the extent of PAH impacted soils identified during the UST removal program.

3.2 Soil Sample Collection and Analysis

Representative soil samples were acquired throughout the intrusive assessment at regular intervals. The soil samples collected from the boreholes were logged with respect to the nature, depth, and thickness of the subsurface materials. Disposable latex gloves were used and replaced between the handling of each sample. Where possible, a portion of each soil sample was placed in a new, re-sealable plastic bag. The soil samples were allowed to equilibrate prior to screening the headspace of the plastic bag for total organic vapour (TOV) concentration using a photoionization detector (PID) calibrated to hexane. Soil samples selected for analysis were based on visual and olfactory observations, as well as, combustible vapour readings from the PID. The soil samples selected for chemical analysis are summarized below in Table 1.

Table 1: Soil Sample Submission Summary

Borehole Number	Depth	Analysis	Comments
BH201	1.2 to 1.8 m	Heavy metals plus chromium VI	Fill: Slag and black sand, no staining or odours
BH201	1.8 to 2.4 m	Heavy metals plus chromium VI	Native: brown sand, no staining or odours
BH202	0.6 to 1.2 m	Heavy metals plus chromium VI, pH, EC and SAR	Fill: Black sand, some slag, no staining or odours *Field duplicate of this sample was identified as MW302 (0.6 to 1.2 m)
BH202	1.2 to 1.8 m	Heavy metals plus chromium VI	Native: Brown sand, no staining or odours
BH202	1.8 to 2.4m	Heavy metals plus chromium VI	Native: Brown sand, no staining or odours
BH203	1.8 to 2.4 m	Heavy metals plus chromium VI	Native: Brown sand, no staining or odours
BH204	0 to 0.6 m	Heavy metals plus chromium VI	Fill: Sand and gravel over native topsoil, no staining or odours
BH205	0.6 to 1.2 m	Heavy metals plus chromium VI	Native: Reddish brown, silty sand, no staining or odours
BH206	0 to 0.6 m	Heavy metals plus chromium VI	Fill: Brown sand and gravel; over Fill: Black sand and slag, no staining or odours
BH207	0 to 0.6 m	Heavy metals plus chromium VI	Fill: Black sand, some slag; over Native: Reddish brown sand, no staining or odours
BH207	0.6 to 1.2 m	Heavy metals plus chromium VI	Native: Brown sand, no staining or odours
BH208	0.6 to 1.2 m	Heavy metals plus chromium VI	Native: Brown sand, no staining or odours
BH209	0.6 to 1.2 m	Heavy metals plus chromium VI	Fill: Brown sand and gravel, trace slag, no staining or odours
BH209	1.2 to 1.8 m	Heavy metals plus chromium VI	Fill: Brown sand and gravel, trace

			slag, no staining or odours
BH209	1.8 to 2.4 m	Heavy metals plus chromium VI	Native: Greyish brown sand and gravel, no staining or odours *Field duplicate identified as MW310 (1.8 to 2.4 m)
BH210	1.8 to 2.4 m	PAHs, TPH (F1-F4), and BTEX	Native: Brown, sand, no staining or odours
BH211	0 to 0.6 m	Heavy metals plus chromium VI	Fill: Reddish brown sand, no staining or odours
BH211	1.2 to 1.8 m	Heavy metals plus chromium VI	Native: Brown sand, green staining, no odours

All soil samples retained for analysis were placed in clean laboratory supplied jars, sealed with plastic screw caps, and stored in a cooler at a temperature of approximately 4 degrees Celsius. Selected soil samples were transferred to the CAEAL-certified Maxxam Analytics Inc. (Maxxam) laboratory in Mississauga, Ontario.

3.3 Framework for Evaluation

The results of the chemical analysis for the soil samples submitted to the laboratory were evaluated against the coarse textured soil and ground water criteria included in Table 3 of the MOE's document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*", March 2004 for residential/parkland/institutional and industrial/commercial/community land-uses in non-potable ground water situations.

4.0 RESULTS

4.1 Geological Conditions

The locations of the boreholes completed as part of the Soil Delineation Program are shown on Figure 1. A brief summary of the subsurface conditions encountered in the boreholes are presented below.

Boreholes BH201, BH202, BH203, BH209 and BH211 were advanced through the concrete slab of the former building structure. BH204, BH205 and BH206 were advanced through an asphalt parking lot. Boreholes BH207 and BH208 were advanced through fill material and BH210 was drilled through a grassed area.

Sand to sand with gravel fill material was encountered underlying the above noted surfaces to a depths ranging from 0.3 m to 1.8 m below ground surface (bgs), with the exception BH210 where fill material was not encountered. In general, this fill material was observed to contain slag, and black sand.

Sand ranging from fine to medium-grained with varying amounts of silt to sand and gravel was encountered beneath the fill material in all of the boreholes to their termination depths which ranged from 3.1 to 3.7 m bgs.

The detailed borehole logs used for the soil delineation program are presented in Appendix A.

4.3 Soil Vapour Readings

Each of the soil samples collected during the drilling program was screened for total organic vapour readings using a photoionization detector (PID). Combustible vapour readings for the collected soil samples from the drilled boreholes were all below the detection limit of the PID.

4.4 Soil Analytical Results

The laboratory certificates of analysis are included in Appendix B. No detectable concentrations of the PAH, TPH fractions (F1 - F4) and BTEX parameters were reported in the soil chemistry results. A soil pH of 7.61 was reported in the soil sample submitted from BH202 (0.6 to 1.2 m). A sodium adsorption ratio (SAR) of 0.73 was reported in the soil sample from BH202 (0.6 to 1.2 m). This concentration is below the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use.

A summary of the heavy metals, chromium VI, EC and pH concentrations above the laboratory method detection limits (MDL) are summarized in Table 2.

The reported antimony concentrations of 62 µg/g in BH202 (0.6 to 1.2 m), 18 µg/g in BH211 (0 to 0.6 m) and 95 µg/g in BH211 (1.2 to 1.8 m) exceed the Table 3 criterion for residential and industrial land uses of 13 µg/g. In addition, the reported antimony concentrations from BH202 (0.6 m to 1.2 m) and BH211 (1.2 to 1.8 m) also exceed the industrial/commercial/community criteria of 40 µg/g.

The reported arsenic concentrations of 29 µg/g in BH201 (1.2 to 1.8 m) and 24 µg/g in BH207 (0 to 0.6 m) exceed the Table 3 criterion residential/parkland/institutional land use of 20 µg/g. In addition, the reported arsenic concentrations of 180 µg/g in BH208 (0 to 0.6 m), 48 µg/g in BH209 (0.6 to 1.2 m), 200 µg/g in BH211 (0 to 0.6 m) and 1400 µg/g in BH211 (1.2 to 1.8 m) exceed the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land uses of 20 µg/g and 40 µg/g, respectively.

The reported beryllium concentration of 1.3 µg/g in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 1.2 µg/g.

The reported cadmium concentrations of 780 µg/g in BH208 (0 to 0.6 m) and 16 µg/g in BH208 (0.6 to 1.2 m) exceed the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 12 µg/g.

The reported chromium VI concentration of 168 µg/g in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 8 µg/g.

The reported total chromium concentration of 1200 µg/g in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 750 µg/g.

The reported copper concentrations of 3800 µg/g in BH202 (0.6 to 1.2 m), 2100 µg/g in BH207 (0 to 0.6 m), 3200 µg/g in BH208 (0 to 0.6 m), 390 µg/g in BH208 (0.6 to 1.2 m), 610 µg/g in BH206 (0.6 to 1.2 m), 400 µg/g in BH211 (0 to 0.6 m), and 3500 µg/g in BH211 (1.2 to 1.8 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 225 µg/g.

The reported lead concentrations of 410 µg/g in BH202 (0.6 to 1.2 m), 490 µg/g in BH207 (0 to 0.6 m) exceed the Table 3 criterion residential land use of 200 µg/g. The reported lead concentration of 7000 µg/g in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential/parkland/institutional and industrial/commercial/community land use of 1000 µg/g.

The reported nickel concentrations of 180 µg/g in BH207 (0 to 0.6 m) and 780 µg/g in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential /parkland/institutional and industrial/commercial/community land use of 150 µg/g.

The reported zinc concentrations of 4100 µg/g in BH202 (0.6 to 1.2 m) and 2300 µg/g in BH207 (0 to 0.6 m) and 2600 µg/g in BH208 (0 to 0.6 m) exceeds the Table 3 criterion for both residential /parkland/institutional and industrial/commercial/community land use of 600 µg/g.

The reported antimony concentrations of 18 µg/g in BH211 (0 to 0.6 m) and 95 µg/g in BH211 (1.2 to 1.8 m) exceed the Table 3 criterion for residential/parkland/institutional land-use of 13 µg/g. In addition, the reported antimony concentration of 95 µg/g in BH211 (1.2 to 1.8 m) also exceeds the Table 3 criterion of 40 µg/g for industrial/commercial/community land-use.

Sample BH302 (0.6 to 1.2 m) was a field duplicate of BH202 (0.6 to 1.2 m) submitted for chemical analysis of heavy metals, chromium VI, pH, EC and SAR. Good correlation was reported in the soil chemistry results between these two samples. Sample BH310 (1.8 to 2.4 m) was a field duplicate of BH210 (1.8 to 2.4 m) submitted for chemical analysis of PAHs, TPH fractions (F1-F4), and BTEX. No detectable concentrations were reported in these two samples for all parameters evaluated.

5.0 Discussion of Soil Chemistry Results

Since the end use of this property has not been determined, the soil chemistry results were compared to both the residential/parkland/institutional and industrial/commercial/community criteria found in Table 3 of the MOE's document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*", March 2004 for land-use in non-potable ground water situations. Non-potable ground water criteria were considered to be the most appropriate since the City of Brantford derives its raw municipal water from the Grand River.

Based on AMEC's review of the soil chemistry results, the heavy metals contamination appears to be associated with the fill material that was encountered in the first 1.8 m and is spatially distributed in three areas of the Site. These areas of contamination are shown on Figure 2. Area 1 is located in the northwestern portion of the Site. In this portion of the Site, elevated concentrations of arsenic, antimony, copper and lead were reported in the chemistry results of the fill samples observed to contain slag and black sand. Soil samples of native materials underlying this fill were free of elevated concentrations of the heavy metals parameters. For discussion purposes this area is estimated to be approximately 40 m in length by 27 m in width and an average of 1.3 m in depth.

Area 2 is located in the central portion of the Site, in the vicinity of the former Crown Electric buffing and Plating operations (Figure 2). In this portion of the Site, elevated concentrations of arsenic, antimony, beryllium, cadmium, copper, lead, nickel, zinc, chromium (total) and chromium iv were reported in the fill and top 20 cm of native material. It should be noted that chromium VI was only reported in one surface sample obtained from BH208, located immediately south of the former buffing and plating operation. The extent of the contamination in this portion of the Site is estimated to be 45 m in width by 50 m in length and an average of 1.5 m in depth.

The third area of the heavy metal impacted soil is located west of the southwestern portion of Area 2 and is characterized as a small zone of surficial impacted soil in the vicinity of BH107, advanced by AMEC during the previous Phase II ESA. This zone is estimated to be 5 m in length by 5 m in width and 0.6 m in depth.

It should be noted that although the Residential/Parkland/Institutional criteria are lower for several of the heavy metal parameters, typically when elevated concentrations were present the values also exceeded the Industrial/Commercial/Community criteria.

As was previously stated, no measurable concentrations of the petroleum hydrocarbon fractions (F2 to F4) nor PAH parameters were reported in the soil samples collected in the vicinity of the former UST. However, a confirmatory soil sample collected from the west wall during the UST excavation reported elevated concentrations of benzo (a) pyrene and petroleum hydrocarbon fractions (F1 to F4). Based on the soil chemistry results AMEC anticipates the volume of contaminated soil in this portion of the Site (Area 4) is minimal and has been estimated to be approximately 2 m in length, 2 m in width within a 0.2 m thick zone of black staining encountered at a depth of approximately 1.8 m below ground surface (Figure 2).

6.0 Discussion of Soil Remediation Options

Based on AMEC's review of the soil chemistry data, we present two scenarios for Site redevelopment. The first scenario considers excavation and off-Site disposal of the contaminated soils. Under this land-use scenario it has been assumed that the remediation of the property would be suitable for residential re-development. This assumption has assumed the soils will be classified as solid non-hazardous waste as per O.Reg. 558. Based on the contaminated soil volumes previously presented and a soil density of 2, AMEC has assumed that 7,800 tonnes of contaminated soils will be disposed of off-Site. AMEC has assumed that the scope of work would include: excavation of the contaminated soil; disposal of this material in a licensed landfill Site; full AMEC supervision; and, collection and analysis of confirmatory soil samples. This assumption assumes that Site re-development will occur simultaneously, therefore backfill and compaction **has not** been included in this ballpark remediation scenario. If the remediation costs are assumed to be \$50.00/tonne, the cost to remediate approximately 9,500 tonnes of contaminated material is estimated to be \$475,000.00 (excluding GST). If a 25% remediation contingency is applied, AMEC estimates the clean up costs of 9,500 tonnes of contaminated soils, will range from \$475,000.00 to \$593,750.00 (excluding GST). The above noted scenario assumes the remediation will proceed by field screening the soils using an x-ray fluorescent (XRF) analyzer.

The second option AMEC presents considers remediating only the most heavily contaminated soils and completing a Risk Assessment (RA) on the remainder of the property. This assumption assumes that the Site will continue in either industrial or commercial land-use. Based on this assumption, a limited soil remediation program south of the former Buffing and Plating operations in the vicinity of BH208 will occur. The remediation will include excavation and off-Site disposal of all chromium VI, PAH and petroleum hydrocarbon (F1 to F4) impacted soil. This assumption is based on the excavation and off-Site disposal of 1,500 tonnes of

impacted soil; restoration of the excavation; and, the completion of a RA on the remainder of the contaminated soils. AMEC estimates the costs associated with the partial clean-up with RA to meet industrial/commercial/community land-use to be \$165,000.00 (excluding GST).

As with any remediation project there is a potential that additionally contaminated soils, that to date are unknown maybe encountered. However, the above noted two remedial strategies provide first order cost estimates on two remedial strategies. The conventional "dig and dump" technology represents the most expensive option. However, this option provides the greatest amount of re-development flexibility and eliminates potential financial barriers a prospective developer may encounter when purchasing the property. The RA approach is a viable option and provides adequate protection for human and environmental receptors. Financial institutions are becoming more accepting of RA Site since the inception of O.Reg.153/04, in which the Ministry acknowledged the importance of the RA process and developed stringent criteria for their completion. It should be noted that the RA will undergo a review process at the MOE. It is possible that during the review process, the MOE may require additional testing and/or soil removal occur.

7.0 QUALIFICATIONS

AMEC has prepared this report for the exclusive use of the City of Brantford in evaluating the environmental condition of the subject property at the time of AMEC's Site assessment. AMEC will not be responsible for the use of this report by any third party, or reliance on or any decision to be made based on it without the prior written consent of AMEC. AMEC accepts no responsibility for damages, if any, by any third party as a result of decisions or actions based on this report.

This report presents an overview of issues of environmental concern, reflecting AMEC's best judgment using information reasonably available at the subject property at the time of AMEC's Site assessment. AMEC has prepared this report using information understood to be factual and correct and shall not be responsible for conditions arising from information or facts that were concealed or not fully disclosed to AMEC during the period of time for which the work was being conducted. The limitations of the subsurface investigation are specified in Appendix C.

Respectfully Submitted,

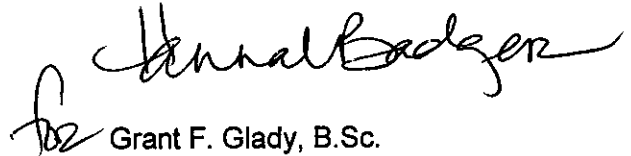
**AMEC Earth & Environmental,
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Table 2: Summary of Soil Analytical Results Page 1 of 4

Parameter	MDL	Table 3		BH201 (1.2 to 1.8m)	BH201 (1.8 to 2.4 m)	BH202 (0.6 to 1.2 m)	BH202 (1.2 to 1.8 m)	BH202 (1.8 to 2.4 m)	BH203 (1.2 to 1.8 m)	BH204 (0 to 0.6 m)
		Residential/ Parkland/ Institutional	Industrial/ Commercial/ Community							
Antimony (Sb)	1	13	40	1.6	1.4	62	ND	ND	ND	1.3
Arsenic (As)	1	20	40	29	3.7	4.4	ND	2.7	5.9	4.6
Barium (Ba)	0.5	750	1500	98	30	44	17	16	20	53
Beryllium (Be)	0.5	1.2	1.2	0.5	ND	ND	ND	ND	ND	ND
Cadmium (Cd)	0.3	12	12	0.7	1.1	12	ND	ND	ND	1.8
Chromium VI	0.05-2.50	8	8	ND	0.36	ND	ND	ND	ND	ND
Total Chromium (Cr)	0.5	750	750	10	13	8.6	4.8	7.4	4.2	12
Cobalt (Co)	0.5	40	80	15	3.3	3.7	1.7	2.8	2.7	3.2
Copper (Cu)	0.5	225	225	100	12	3800	9.6	14	11	51
Lead (Pb)	1	200	1000	67	31	410	6.8	7.2	5	110
Molybdenum (Mo)	0.5	40	40	11	ND	0.6	ND	ND	ND	ND
Nickel (Ni)	0.5	150	150	19	12	25	4.2	5.9	5.4	13
Selenium (Se)	1	10	10	2.8	ND	ND	ND	ND	ND	ND
Silver (Ag)	0.3	20	40	ND	ND	1.9	ND	ND	ND	ND
Thallium (Tl)	1	4.1	32	ND	ND	ND	ND	ND	ND	ND
Vanadium (V)	0.5	200	200	15	16	13	5.6	18	7.3	15
Zinc (Zn)	3	600	600	300	61	4100	30	57	26	110

Note:

MDL: Laboratory Method Detection Limit

Table 3 = MOE's Table 3 criteria found in their document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV, 1 of the Environmental Protection Act for residential/parkland/institutional and industrial/commercial/community land-uses in soil situations.

Bold = Reported soil concentrations exceed Table 3 Residential/Parkland/Institutional land-use criterion

Bold Italics = Reported soil concentrations exceed Table 3 Residential/Parkland/Institutional and Industrial/Commercial/Community land-use criterion

Table 2: Summary of Soil Analytical Results Page 2 of 4

Parameter	MDL	Table 3		BH205 (0.6 to 1.2)	BH206 (0 to 0.6 m)	BH207 (0 to 0.6 m)	BH207 (0.6 to 1.2 m)	BH208 (0 to 0.6 m)	BH208 (0.6 to 1.2 m)
		Residential/ Parkland/ Institutional	Industrial/ Commercial/ Community						
Antimony (Sb)	1	13	40	ND	1.5	7.4	ND	16	ND
Arsenic (As)	1	20	40	5.2	17	24	1.7	180	4.4
Barium (Ba)	0.5	750	1500	31	93	200	8	380	31
Beryllium (Be)	0.5	1.2	1.2	ND	0.8	0.8	ND	1.3	ND
Cadmium (Cd)	0.3	12	12	2.9	1.6	200	ND	780	16
Chromium VI	0.05-2.50	8	8	ND	ND	ND	ND	168	ND
Total Chromium (Cr)	0.5	750	750	16	64	130	4.4	1200	13
Cobalt (Co)	0.5	40	80	3.7	7.3	11	1.9	9.8	4.6
Copper (Cu)	0.5	225	225	36	61	2100	15	3200	390
Lead (Pb)	1	200	1000	39	88	490	4.9	7000	19
Molybdenum (Mo)	0.5	40	40	0.5	2.3	4.1	ND	2.6	ND
Nickel (Ni)	0.5	150	150	14	17	180	4.4	780	40
Selenium (Se)	1	10	10	ND	1.2	1.6	ND	2.5	ND
Silver (Ag)	0.3	20	40	ND	ND	3.8	ND	5	ND
Thallium (Tl)	1	4.1	32	ND	ND	ND	ND	ND	ND
Vanadium (V)	0.5	200	200	20	33	34	7.2	50	21
Zinc (Zn)	3	600	600	71	190	2300	27	2600	130

Note:

MDL: Laboratory Method Detection Limit

Table 3 = MOE's Table 3 criteria found in their document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV. 1 of the Environmental Protection Act for residential/parkland/institutional and industrial/commercial/community land-uses in soil situations.

Bold = Reported soil concentrations exceed Table 3 Residential/Parkland/Institutional land-use criterion

Bold Italics = Reported soil concentrations exceed Table 3 Residential/Parkland/Institutional and Industrial/Commercial/Community land-use criterion

Table 2: Summary of Soil Analytical Results Page 3 of 4

Parameter	MDL	Table 3		BH209 (0.6 to 1.2 m)	BH209 (1.2 to 1.8 m)	BH209 (1.8 to 2.4 m)	BH211 (0 to 0.6 m)	BH211 (1.2 to 1.8 m)	BH302 Duplicate (0.6 to 1.2 m)	BH310 Duplicate (1.8 to 2.4 m)
		Parkland/ Institutional	Industrial/ Commercial/ Community							
Antimony (Sb)	1	13	40	2.1	ND	ND	18	95		
Arsenic (As)	1	20	40	4.6	4.6	2.5	200	1400	13	ND
Barium (Ba)	0.5	750	1500	55	40	25	44	25	71	ND
Beryllium (Be)	0.5	1.2	1.2	ND	ND	ND	ND	ND	ND	ND
Cadmium (Cd)	0.3	12	12	8.5	0.6	ND	0.5	ND	5.4	ND
Chromium VI	0.05-2.50	8	8	ND	ND	ND	ND	ND	ND	ND
Total Chromium (Cr)	0.5	750	750	12	11	4.6	8.5	18	14	ND
Cobalt (Co)	0.5	40	80	3.3	4.9	2.4	2.9	2.1	4.5	ND
Copper (Cu)	0.5	225	225	610	44	15	400	3500	1400	ND
Lead (Pb)	1	200	1000	83	21	9.4	75	130	130	ND
Molybdenum (Mo)	0.5	40	40	ND	ND	ND	0.6	ND	0.6	ND
Nickel (Ni)	0.5	150	150	10	10	6.4	16	60	15	ND
Selenium (Se)	1	10	10	ND	ND	ND	ND	ND	ND	ND
Silver (Ag)	0.3	20	40	1.3	ND	ND	25	16	0.6	ND
Thallium (Tl)	1	4.1	32	ND	ND	ND	ND	ND	ND	ND
Vanadium (V)	0.5	200	200	14	20	9.4	14	18	23	ND
Zinc (Zn)	3	600	600	430	130	54	230	200	1800	ND

Note:

MDL: Laboratory Method Detection Limit

Table 3 = MOE's Table 3 criteria found in their document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV. 1 of the Environmental Protection Act for residential/parkland/institutional and industrial/commercial/community land-uses in soil situations.

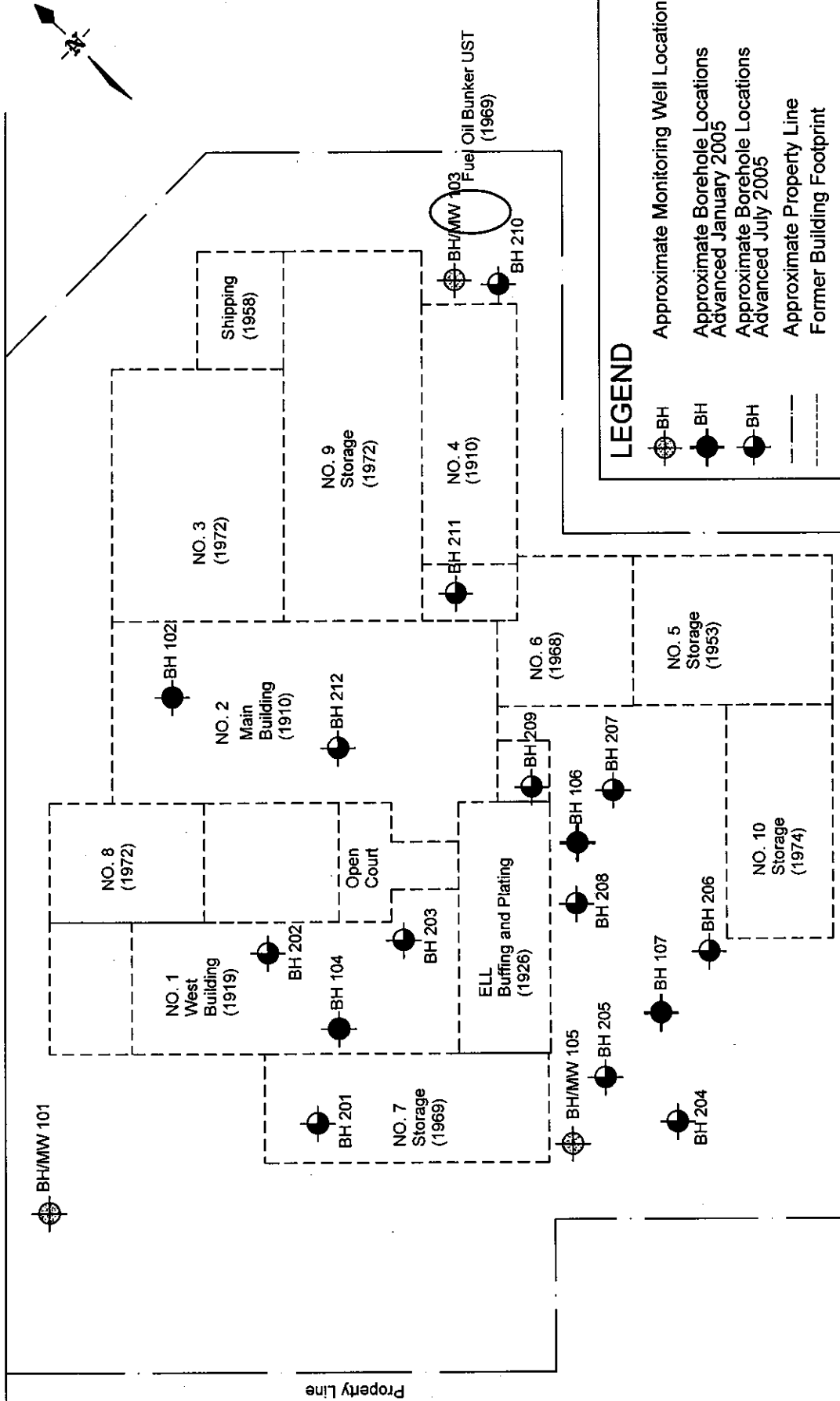
Bold = Reported soil concentrations exceed Table 3 Residential/Parkland/Institutional land-use criterion

Bold Italics = Reported soil concentrations exceed Table 3 Residential/Parkland/Institutional and Industrial/Commercial/Community land-use criterion

Table 2: Summary of Soil Analytical Results Page 4 of 4

Parameter	Units	DL	BH202 (0.6 to 1.2 m)
Conductivity	umho/cm	2	374
pH	pH	N/A	7.61
Sodium Adsorption Ratio	N/A	N/A	0.73

SYDENHAM STREET

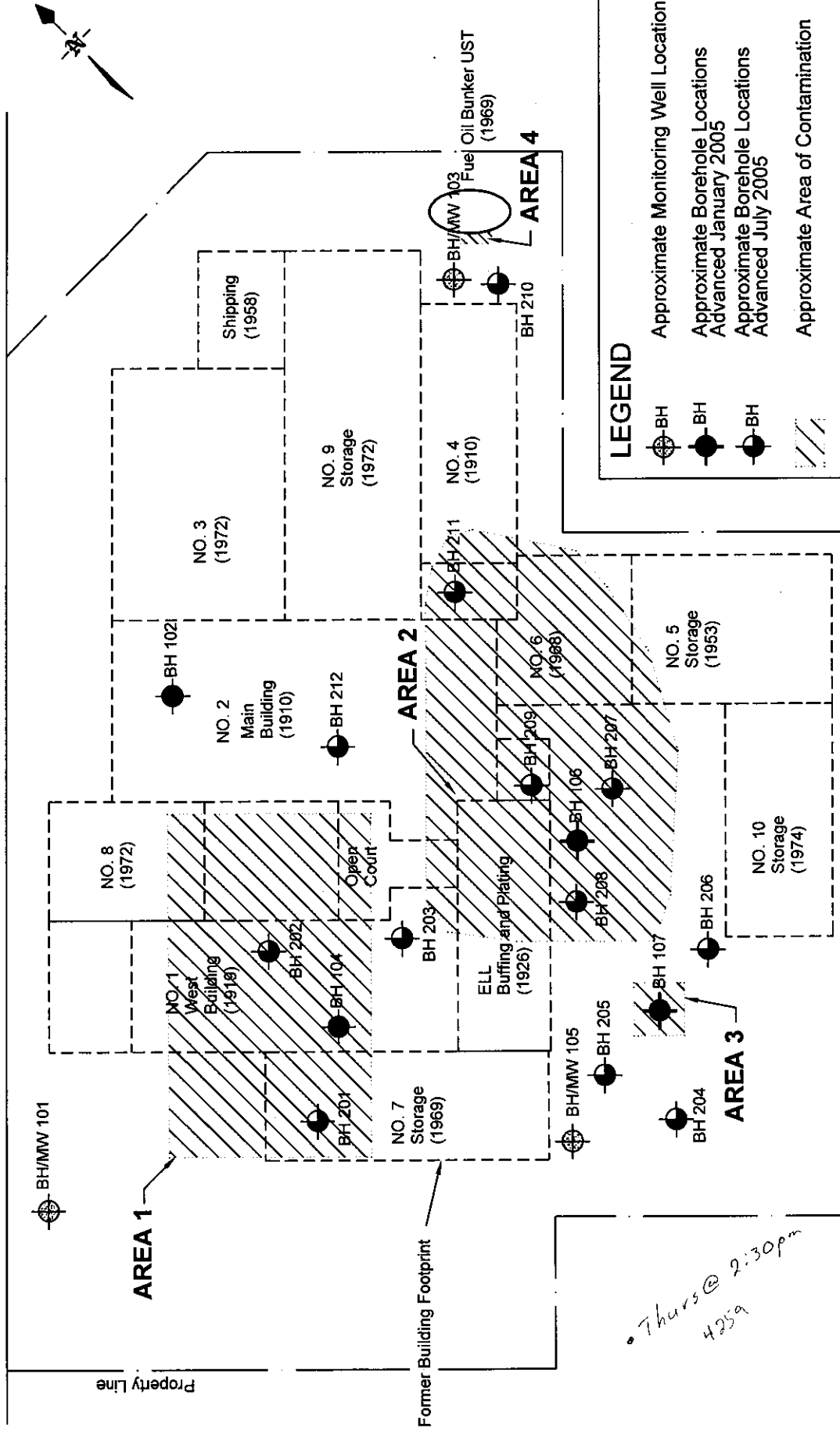


LEGEND

- Approximate Monitoring Well Locations
- Approximate Borehole Locations Advanced January 2005
- Approximate Borehole Locations Advanced July 2005
- Approximate Property Line
- Former Building Footprint

<p>ameco EARTH & ENVIRONMENTAL, A DIVISION OF AMEC AMERICAS LIMITED</p> <p>325 West Street, Suite A201 Brantford, Ontario N3R 3V6</p> <p>Tel: (519)756-1628 Fax: (519)756-3085</p>	<p>FIGURE 1: BOREHOLE/MONITORING WELL LOCATION PLAN</p>		<p>PROJECT: Phase II Environmental Site Assessment 17 Sydenham Street BRANTFORD, ONTARIO</p>	
	<p>CLIENT: City of Brantford</p> <p>PROJECT NO: SW0050707</p>	<p>DRAWN BY: LR</p>	<p>DATE: AUGUST 2005</p>	<p>CHECKED BY: SPK</p>

SYDENHAM STREET



<p>PROJECT: Phase II Environmental Site Assessment 17 Sydenham Street BRANTFORD, ONTARIO</p>	<p>FIGURE 2: ZONES OF SOIL CONTAMINATION PLAN</p>	<p>amec EARTH & ENVIRONMENTAL A DIVISION OF AMEC AMERICAS LIMITED</p> <p>325 West Street, Suite A201 Tel: (519)756-1628 Brantford, Ontario Fax: (519)756-3085 N3R 3V6</p>
<p>DRAWN BY: LR</p>	<p>CLIENT: City of Brantford</p>	<p>DATE: AUGUST 2005</p>
<p>CHECKED BY: SPK</p>	<p>PROJECT NO: SW0050707</p>	<p>SCALE: N.T.S</p>

**APPENDIX A
BOREHOLE LOGS**

LOG OF BOREHOLE 201

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS	
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm		NMC %
[Cross-hatch symbol]	~ 150 mm CONCRETE		99.77								
[Brown cross-hatch symbol]	Mixed sand & gravel FILL, damp no odour, no staining	brown			1	SS	56	34			
[Black cross-hatch symbol]	Slag & sand FILL with trace gravel, damp no odour, no staining	black	99.44		2	SS	33	24			
[Brown cross-hatch symbol]		brown		99	1						
[Brown cross-hatch symbol]		brown			3	SS	58	7			
[Brown cross-hatch symbol]		brown		98	2						
[Brown cross-hatch symbol]	Fine to medium SAND with trace gravel, oxidation stains in upper portion, moist no odour, no staining	brown	98.23		4	SS	67	9			
[Brown cross-hatch symbol]		brown			5	SS	75	51			
[Brown cross-hatch symbol]		brown		97	3						
[Brown cross-hatch symbol]	END OF BOREHOLE		97.02								

Borehole dry & open at completion

ENV-UM-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 29/08/05

VERTICAL SCALE: 1:20

CHECKED BY: **D.D.**



LOG OF BOREHOLE 202

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm	
99.77	~ 150 mm CONCRETE		100							
99.44	Mixed sand & gravel FILL, damp no odour, no staining	brown			1	SS	56	51	0	Borehole dry & open at completion
99.44	Sand FILL with some slag & coal, damp no odour, no staining	black			2	SS	83	20	0	
98.67	Fine to medium SAND faint layering, moist no odour, no staining	brown		99	3	SS	33	7	0	
97.02	-some gravel present below ~ 1.8 m depth	dense		98	4	SS	63	40	0	
97.02	END OF BOREHOLE			97	5	SS	50	36	0	

ENV-IM-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 29/08/05

VERTICAL SCALE: 1:20

CHECKED BY: **D.D.**



LOG OF BOREHOLE 203

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS	
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm		NMC %
99.77	~ 150 mm CONCRETE										
99.44	Mixed sand & gravel FILL, damp no odour, no staining ~ 50 mm seam of black sand & slag	brown			1	SS	67	41	0		
96.78	Sand FILL with trace slag & rootlets, damp no odour, no staining	black			2	SS	63	5	0		
96.78	Fine to medium SAND with oxidation stains in upper portion, moist no odour, no staining	compact brown			3	SS	67	14	0		
97.02	~ 50 mm oxidation seam near 1.8 m depth -trace gravel present below ~ 1.8 m depth	dense			4	SS	92	33	0		
97.02	END OF BOREHOLE				5	SS	83	38	0		

Borehole dry & open at completion

ENV-111-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 28/08/05

VERTICAL SCALE: 1:20

CHECKED BY: D.D.



LOG OF BOREHOLE 204

PROJECT No.: SW0050707 CLIENT: City of Brantford PROJECT NAME: Additional Phase II ESA LOCATION: 17 Sydenham Street, Brantford ON DATE: 28 July 2005	ELEVATION: 100.00 m.a.s.l. DATUM: Below Ground Surface METHOD: Hollow Stem Auger DIAMETER: 200 mm LOGGED BY: M.W., AMEC
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SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS (ppm)	
99.88	50 mm ASPHALT brown		99.88	0	1	SS	63	52	0	
	Mixed sand & gravel FILL, damp no odour, no staining									
99.44	~ 50 mm buried topsoil near ~ 0.46 m depth reddish-brown		99.44	0.56	2	SS	63	16	0	
	SILTY SAND with trace gravel, moist no odour, no staining	compact								
98.78	Fine to medum SAND with trace gravel no odour, no staining brown		98.78	1.22	3	SS	67	12	0	
		compact								
			99	1						
			98	2	4	SS	71	30	0	
		dense								
			97	3	5	SS	71	33	0	
			97.02	3.00						
	END OF BOREHOLE									Borehole dry & open at completion

ENV/IM-BRANTFORD_0-0707LOGSS.GPJ_AMEC.GDT_29/08/05

VERTICAL SCALE: 1:20

 CHECKED BY: **D.D.**


LOG OF BOREHOLE 205

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm	
99.88	50 mm ASPHALT brown				1	SS	67	18	0	
99.66	Mixed sand & gravel FILL, damp no odour, no staining black									
99.44	Sand FILL, some slag & roofing shingles, damp no odour, no staining reddish-brown				2	SS	50	14	0	
99.78	compact SILTY SAND with trace gravel, moist no odour, no staining brown				3	SS	71	19	0	
98.78	compact Fine to medium SAND no odour, no staining dense				4	SS	83	32	0	
97.02	compact END OF BOREHOLE				5	SS	83	34	0	Borehole dry & open at completion

ENV/IM-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 29/08/05

VERTICAL SCALE: 1:20

CHECKED BY: **D.D.**



LOG OF BOREHOLE 207

PROJECT No.: SW0050707 CLIENT: City of Brantford PROJECT NAME: Additional Phase II ESA LOCATION: 17 Sydenham Street, Brantford ON DATE: 28 July 2005	ELEVATION: 100.00 m.a.s.l. DATUM: Below Ground Surface METHOD: Hollow Stem Auger DIAMETER: 200 mm LOGGED BY: M.W., AMEC
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SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm	
X	Sand FILL with some slag, damp no odour, no staining		100.00	0	1	SS	100	14	0	
99.66 compact	Fine to medium SAND, layered, moist no odour, no staining	brown			2	SS	42	10	0	
			99	1						
					3	SS	67	12	0	
			98	2	4	SS	92	48	0	
	dense - trace gravel present below ~ 1.8 m depth				5	SS	83	36	0	
			97	3						
97.02	END OF BOREHOLE									Borehole dry & open at completion

ENV-114-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 29/08/05

VERTICAL SCALE: 1:20

 CHECKED BY: **D.D.**


LOG OF BOREHOLE 208

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm	
[Cross-hatched pattern]	sand FILL, with trace slag & coal, moist no odour, no staining		100	0	1	SS	75	11	0	
[Dotted pattern]	99.44 compact Fine to medium SAND with some gravel, moist no odour, no staining	brown			2	SS	67	12	0	
[Dotted pattern]	dense		99	1	3	SS	63	37	0	
[Dotted pattern]	very dense		98	2	4	SS	50	72	0	
[Dotted pattern]			97	3	5	SS	58	100+	0	
[Dotted pattern]	97.02 END OF BOREHOLE									Borehole dry & open at completion

ENV./M.-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 29/08/05

VERTICAL SCALE: 1:20

CHECKED BY: D.D.



LOG OF BOREHOLE 209

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm	
99.77	~ 150 mm CONCRETE		100							
99.44	Mixed sand & gravel FILL, damp no odour, no staining	brown			1	SS	33	6	0	Borehole dry & open at completion
99.44	Sand FILL with trace gravel, cobbles & slag, moist no odour, no staining	black			2	SS	54	4	0	
98.23	Fine to medium SAND with gravel, damp to wet no odour, no staining	brown			3	SS	42	12	0	
97.02	compact dense				4	SS	75	22	0	
97.02	END OF BOREHOLE				5	SS	67	42	0	

ENV/JM-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 28/08/05

VERTICAL SCALE: 1:20

 CHECKED BY: **D.D.**


LOG OF BOREHOLE 210

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm	
[Symbol]	TOPSOIL no odour, no staining		100.00	0	1	SS	42	5	0	
[Symbol]	99.86 loose SANDY SILT to SILTY SAND, moist no odour, no staining reddish-brown		99.86	0.14	2	SS	63	4	0	
[Symbol]	98.78 loose Fine to medium SAND, moist no odour, no staining brown		98.78	1.22	3	SS	58	7	0	
[Symbol]	compact				4	SS	83	24	0	
[Symbol]	dense				5	SS	75	41	0	
[Symbol]	97.02 END OF BOREHOLE		97.02	2.98	3					Borehole dry & open at completion

ENV-JM-BRANTFORD_0-0707LOGS.GPJ AMEC.GDT_28/08/05

VERTICAL SCALE: 1:20

CHECKED BY: D.D.



LOG OF BOREHOLE 211

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm	
~ 150 mm CONCRETE			99.77							
Sand FILL, wet no odour, no staining	reddish-brown				1	SS	17	1		
					2	SS	50	2		
			99	1						
compact Fine to medium SAND with heavy oxidation stains in upper portion, moist no odour, green staining in upper 1.2 m	brown				3	SS	67	12		
dense					4	SS	75	31		
			98	2						
- trace gravel present, and no staining below ~ 2.4 m depth, moist to wet					5	SS	83	34		
					6	SS	58	45		
			97	3						
END OF BOREHOLE			96.25							Borehole dry & open at completion

ENV-11M-BRANTFORD 0-0707LOGS.GPJ AMEC.GDT 29/08/05

VERTICAL SCALE: 1:20

CHECKED BY: **D.D.**



LOG OF BOREHOLE 212

PROJECT No.: SW0050707	ELEVATION: 100.00 m.a.s.l.
CLIENT: City of Brantford	DATUM: Below Ground Surface
PROJECT NAME: Additional Phase II ESA	METHOD: Hollow Stem Auger
LOCATION: 17 Sydenham Street, Brantford ON	DIAMETER: 200 mm
DATE: 28 July 2005	LOGGED BY: M.W., AMEC

SYMBOL	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & No.	ELEVATION (m)	DEPTH (m)	SAMPLES					REMARKS	
					No.	TYPE	% REC.	N-VALUE	SOIL VAPOURS ppm		NMC %
99.77	~ 150 mm CONCRETE		99.77								
99.44	Sand FILL with trace slag & concrete, moist no odour, no staining	black			1	SS	56	8	0		
99.44	SAND with trace gravel, oxidation stains in upper portion, moist no odour, no staining	loose brown			2	SS	67	5	0		
99.00	compact		99.00	1							
98.50	very dense		98.50		3	SS	63	16	0		
98.00			98.00	2	4	SS	83	25	0		
97.50			97.50		5	SS	92	52	0		
97.02	END OF BOREHOLE		97.02	3							Borehole dry & open at completion

ENV/111-BRANTFORD_0-0707LOGS.GPJ AMEC.GDT_28/08/05

VERTICAL SCALE: 1:20

CHECKED BY: D.D.



APPENDIX B
LABORATORY CERTIFICATES OF APPROVAL

Your Project #: SW0050707
Your C.O.C. #: 357540

Attention: Susan Pelton-Klunder
AMEC Earth & Environmental Ltd
325 West St
Suite A201
Brantford, ON
N3R 3V6

Report Date: 2005/08/10

ANALYTICAL REPORT

MAXXAM JOB #: A572723
Received: 2005/08/02, 15:23

Sample Matrix: SOLID
Samples Received: 21

Analyses	Quantity	Date		Laboratory Method	Method Reference
		Extracted	Analyzed		
Conductivity	2	N/A	2005/08/08	Ont SOP 0071	APHA 2510
Chromium (VI) in Soil	14	2005/08/04	2005/08/04	Ont SOP 0104	EPA 7196
Chromium (VI) in Soil	5	2005/08/05	2005/08/05	Ont SOP 0104	EPA 7196
Petroleum Hydro. CCME FI & BTEX in Soil	2	2005/08/05	2005/08/08	Ont SOP-0816	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	2	2005/08/05	2005/08/08	Ont SOP-0817	CCME CWS
Total Metals in Soil by Axial ICP-AES	19	2005/08/08	2005/08/08	SOP ING-101	EPA SW846-M6010B
MOISTURE	21	N/A	2005/08/05	Ont SOP-0114	MOE HANDBOOK(1983)
PAH Compounds in Soil by GC/MS (SIM)	2	2005/08/05	2005/08/08	EPA 8270	GC/MS
PH	2	2005/08/08	2005/08/08	Ont SOP 0067	APHA 4500H
SAR	2	2005/08/02	2005/08/02	Ont SOP 0072	EPA 6010

MAXXAM ANALYTICS INC.

TROY CARRIERE, B.Sc.
Environmental Scientific Specialist

TCA/rm
encl.

Total cover pages: 1

Mississauga Env: 6740 Campobello Road L5N 2L8 Telephone(905) 817-5700 FAX(905) 817-5777

This document is in electronic format, hard copy is available on request.

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

RESULTS OF ANALYSES OF SOLID

Maxxam ID		H45684	H45685	H45686	H45687	H45688		
Sampling Date		2005/07/28	2005/07/28	2005/07/28	2005/07/28	2005/07/28		
COC Number		357540	357540	357540	357540	357540		
	Units	BH202 (2 TO 4)	BH202 (4 TO 6)	BH202 (6 TO 8)	BH203 (4 TO 6)	BH201 (4 TO 6)	DL	QC Batch

INORGANICS								
Conductivity	umho/cm	374					2	794689
Moisture	%	11	6.7	11	9.5	18	0.2	794206
pH	pH	7.61					N/A	794685
Sodium Adsorption Ratio	N/A	0.730					N/A	791704

QC Batch = Quality Control Batch

Maxxam ID		H45689	H45690	H45691	H45692	H45693		
Sampling Date		2005/07/28	2005/07/28	2005/07/28	2005/07/28	2005/07/28		
COC Number		357540	357540	357540	357540	357540		
	Units	BH201 (6 TO 8)	BH209 (2 TO 4)	BH209 (4 TO 6)	BH209 (6 TO 8)	BH207 (2 TO 4)	DL	QC Batch

INORGANICS								
Moisture	%	6.2	11	8.8	4.1	2.9	0.2	794206

QC Batch = Quality Control Batch

Maxxam ID		H45694	H45695	H45696	H45697	H45698		
Sampling Date		2005/07/28	2005/07/28	2005/07/28	2005/07/28	2005/07/28		
COC Number		357540	357540	357540	357540	357540		
	Units	BH207 (0 TO 2)	BH208 (2 TO 4)	BH208 (0-2)	BH205 (2 TO 4)	BH204 (0 TO 2)	DL	QC Batch

INORGANICS								
Moisture	%	16	5.2	14	8.3	3.3	0.2	794206

QC Batch = Quality Control Batch

Maxxam Job #: A572723
Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
Client Project #: SW0050707
Project name:
Sampler Initials:

RESULTS OF ANALYSES OF SOLID

Maxxam ID		H45699	H45700	H45701	H45702	H45703		
Sampling Date		2005/07/28	2005/07/28	2005/07/28	2005/07/28	2005/07/28		
COC Number		357540	357540	357540	357540	357540		
	Units	BH206 (0 TO 2)	BH211 (0 TO 2)	BH211 (4 TP 6)	BH210 (6 TO 8)	BH302 (2 TO 4)	DL	QC Batch

INORGANICS								
Conductivity	umho/cm					626	2	794689
Moisture	%	13	13	12	8.0	9.0	0.2	794206
pH	pH					8.03	N/A	794685
Sodium Adsorption Ratio	N/A					0.830	N/A	791704

QC Batch = Quality Control Batch

Maxxam ID		H45704		
Sampling Date		2005/07/28		
COC Number		357540		
	Units	BH310 (6 TO 8)	DL	QC Batch

INORGANICS				
Moisture	%	7.1	0.2	794206

QC Batch = Quality Control Batch

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		H45684		H45685		H45686	H45687		
Sampling Date		2005/07/28		2005/07/28		2005/07/28	2005/07/28		
COC Number		357540		357540		357540	357540		
	Units	BH202 (2 TO 4)	DL	BH202 (4 TO 6)	QC Batch	BH202 (6 TO 8)	BH203 (4 TO 6)	DL	QC Batch

METALS									
Total Antimony (Sb)	ug/g	62	1	ND	794767	ND	ND	1	794767
Total Arsenic (As)	ug/g	4.4	1	ND	794767	2.7	5.9	1	794767
Total Barium (Ba)	ug/g	44	0.5	17	794767	16	20	0.5	794767
Total Beryllium (Be)	ug/g	ND	0.5	ND	794767	ND	ND	0.5	794767
Total Cadmium (Cd)	ug/g	12	0.3	ND	794767	ND	ND	0.3	794767
Total Chromium (Cr)	ug/g	8.6	0.5	4.8	794767	7.4	4.2	0.5	794767
Total Cobalt (Co)	ug/g	3.7	0.5	1.7	794767	2.8	2.7	0.5	794767
Total Copper (Cu)	ug/g	3800	0.5	9.6	794767	14	11	0.5	794767
Total Lead (Pb)	ug/g	410	1	6.8	794767	7.2	5.0	1	794767
Total Molybdenum (Mo)	ug/g	0.6	0.5	ND	794767	ND	ND	0.5	794767
Total Nickel (Ni)	ug/g	25	0.5	4.2	794767	5.9	5.4	0.5	794767
Total Selenium (Se)	ug/g	ND	1	ND	794767	ND	ND	1	794767
Total Silver (Ag)	ug/g	1.9	0.3	ND	794767	ND	ND	0.3	794767
Total Thallium (Tl)	ug/g	ND	1	ND	794767	ND	ND	1	794767
Total Vanadium (V)	ug/g	13	0.5	5.6	794767	18	7.3	0.5	794767
Total Zinc (Zn)	ug/g	4100	3	30	794767	57	26	3	794767
METALS									
Chromium (VI)	ug/g	ND	0.5	ND	793350	ND	ND	0.05	793514

ND = Not detected
 QC Batch = Quality Control Batch

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		H45688		H45689		H45690		
Sampling Date		2005/07/28		2005/07/28		2005/07/28		
COC Number		357540		357540		357540		
	Units	BH201 (4 TO 6)	DL	BH201 (6 TO 8)	DL	BH209 (2 TO 4)	DL	QC Batch

METALS								
Total Antimony (Sb)	ug/g	1.6	1	1.4	1	2.1	1	794767
Total Arsenic (As)	ug/g	29	1	3.7	1	48	1	794767
Total Barium (Ba)	ug/g	98	0.5	30	0.5	55	0.5	794767
Total Beryllium (Be)	ug/g	0.5	0.5	ND	0.5	ND	0.5	794767
Total Cadmium (Cd)	ug/g	0.7	0.3	1.1	0.3	8.5	0.3	794767
Total Chromium (Cr)	ug/g	10	0.5	13	0.5	12	0.5	794767
Total Cobalt (Co)	ug/g	15	0.5	3.3	0.5	3.3	0.5	794767
Total Copper (Cu)	ug/g	100	0.5	12	0.5	610	0.5	794767
Total Lead (Pb)	ug/g	67	1	31	1	83	1	794767
Total Molybdenum (Mo)	ug/g	1.1	0.5	ND	0.5	ND	0.5	794767
Total Nickel (Ni)	ug/g	19	0.5	12	0.5	10	0.5	794767
Total Selenium (Se)	ug/g	2.8	1	ND	1	ND	1	794767
Total Silver (Ag)	ug/g	ND	0.3	ND	0.3	1.3	0.3	794767
Total Thallium (Tl)	ug/g	ND	1	ND	1	ND	1	794767
Total Vanadium (V)	ug/g	15	0.5	16	0.5	14	0.5	794767
Total Zinc (Zn)	ug/g	300	3	61	3	430	3	794767
METALS								
Chromium (VI)	ug/g	ND	0.25	0.36	0.05	ND	0.1	793350

ND = Not detected
 QC Batch = Quality Control Batch

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		H45691		H45692		H45693		
Sampling Date		2005/07/28		2005/07/28		2005/07/28		
COC Number		357540		357540		357540		
	Units	BH209 (4 TO 6)	QC Batch	BH209 (6 TO 8)	QC Batch	BH207 (2 TO 4)	DL	QC Batch

METALS								
Total Antimony (Sb)	ug/g	ND	794767	ND	794767	ND	1	794767
Total Arsenic (As)	ug/g	4.6	794767	2.5	794767	1.7	1	794767
Total Barium (Ba)	ug/g	40	794767	25	794767	8.0	0.5	794767
Total Beryllium (Be)	ug/g	ND	794767	ND	794767	ND	0.5	794767
Total Cadmium (Cd)	ug/g	0.6	794767	ND	794767	ND	0.3	794767
Total Chromium (Cr)	ug/g	11	794767	4.6	794767	4.4	0.5	794767
Total Cobalt (Co)	ug/g	4.9	794767	2.4	794767	1.9	0.5	794767
Total Copper (Cu)	ug/g	44	794767	15	794767	15	0.5	794767
Total Lead (Pb)	ug/g	21	794767	9.4	794767	4.9	1	794767
Total Molybdenum (Mo)	ug/g	ND	794767	ND	794767	ND	0.5	794767
Total Nickel (Ni)	ug/g	10	794767	6.4	794767	4.4	0.5	794767
Total Selenium (Se)	ug/g	ND	794767	ND	794767	ND	1	794767
Total Silver (Ag)	ug/g	ND	794767	ND	794767	ND	0.3	794767
Total Thallium (Tl)	ug/g	ND	794767	ND	794767	ND	1	794767
Total Vanadium (V)	ug/g	20	794767	9.4	794767	7.2	0.5	794767
Total Zinc (Zn)	ug/g	130	794767	54	794767	27	3	794767

METALS								
Chromium (VI)	ug/g	ND	793350	ND	793514	ND	0.05	793350

ND = Not detected
 QC Batch = Quality Control Batch

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		H45694		H45695		H45696		
Sampling Date		2005/07/28		2005/07/28		2005/07/28		
COC Number		357540		357540		357540		
	Units	BH207 (0 TO 2)	QC Batch	BH208 (2 TO 4)	DL	BH208 (0-2)	DL	QC Batch

METALS								
Total Antimony (Sb)	ug/g	7.4	794767	ND	1	16	1	794767
Total Arsenic (As)	ug/g	24	794767	4.4	1	180	1	794767
Total Barium (Ba)	ug/g	200	794767	31	0.5	380	0.5	794767
Total Beryllium (Be)	ug/g	0.8	794767	ND	0.5	1.3	0.5	794767
Total Cadmium (Cd)	ug/g	200	794767	16	0.3	780	0.3	794767
Total Chromium (Cr)	ug/g	130	794767	13	0.5	1200	0.5	794767
Total Cobalt (Co)	ug/g	11	794767	4.6	0.5	9.8	0.5	794767
Total Copper (Cu)	ug/g	2100	794767	390	0.5	3200	0.5	794767
Total Lead (Pb)	ug/g	490	794767	19	1	7000	1	794767
Total Molybdenum (Mo)	ug/g	4.1	794767	ND	0.5	2.6	0.5	794767
Total Nickel (Ni)	ug/g	180	794767	40	0.5	780	0.5	794767
Total Selenium (Se)	ug/g	1.6	794767	ND	1	2.5	1	794767
Total Silver (Ag)	ug/g	3.8	794767	ND	0.3	5.0	0.3	794767
Total Thallium (Tl)	ug/g	ND	794767	ND	1	ND	1	794767
Total Vanadium (V)	ug/g	34	794767	21	0.5	50	0.5	794767
Total Zinc (Zn)	ug/g	2300	794767	130	3	2600	3	794767
METALS								
Chromium (VI)	ug/g	ND	793514	ND	0.05	168	2.5	793350

ND = Not detected
 QC Batch = Quality Control Batch

Maxxam Job #: A572723
Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
Client Project #: SW0050707
Project name:
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		H45697		H45698			H45699		
Sampling Date		2005/07/28		2005/07/28			2005/07/28		
COC Number		357540		357540			357540		
	Units	BH205 (2 TO 4)	QC Batch	BH204 (0 TO 2)	DL	QC Batch	BH206 (0 TO 2)	DL	QC Batch

METALS									
Total Antimony (Sb)	ug/g	ND	794767	1.3	1	794767	1.5	1	794767
Total Arsenic (As)	ug/g	5.2	794767	4.6	1	794767	17	1	794767
Total Barium (Ba)	ug/g	31	794767	53	0.5	794767	93	0.5	794767
Total Beryllium (Be)	ug/g	ND	794767	ND	0.5	794767	0.8	0.5	794767
Total Cadmium (Cd)	ug/g	2.9	794767	1.8	0.3	794767	1.6	0.3	794767
Total Chromium (Cr)	ug/g	16	794767	12	0.5	794767	64	0.5	794767
Total Cobalt (Co)	ug/g	3.7	794767	3.2	0.5	794767	7.3	0.5	794767
Total Copper (Cu)	ug/g	36	794767	51	0.5	794767	61	0.5	794767
Total Lead (Pb)	ug/g	39	794767	110	1	794767	86	1	794767
Total Molybdenum (Mo)	ug/g	0.5	794767	ND	0.5	794767	2.3	0.5	794767
Total Nickel (Ni)	ug/g	14	794767	13	0.5	794767	17	0.5	794767
Total Selenium (Se)	ug/g	ND	794767	ND	1	794767	1.2	1	794767
Total Silver (Ag)	ug/g	ND	794767	ND	0.3	794767	ND	0.3	794767
Total Thallium (Tl)	ug/g	ND	794767	ND	1	794767	ND	1	794767
Total Vanadium (V)	ug/g	20	794767	15	0.5	794767	33	0.5	794767
Total Zinc (Zn)	ug/g	71	794767	110	3	794767	190	3	794767
METALS									
Chromium (VI)	ug/g	ND	793350	ND	0.05	793514	ND	0.25	793350

ND = Not detected
QC Batch = Quality Control Batch

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		H45700	H45701	H45703		
Sampling Date		2005/07/28	2005/07/28	2005/07/28		
COC Number		357540	357540	357540		
	Units	BH211 (0 TO 2)	BH211 (4 TP 6)	BH302 (2 TO 4)	DL	QC Batch

METALS						
Total Antimony (Sb)	ug/g	18	95	13	1	794767
Total Arsenic (As)	ug/g	200	1400	12	1	794767
Total Barium (Ba)	ug/g	44	25	71	0.5	794767
Total Beryllium (Be)	ug/g	ND	ND	ND	0.5	794767
Total Cadmium (Cd)	ug/g	0.5	ND	5.4	0.3	794767
Total Chromium (Cr)	ug/g	8.5	18	14	0.5	794767
Total Cobalt (Co)	ug/g	2.9	2.1	4.5	0.5	794767
Total Copper (Cu)	ug/g	400	3500	1400	0.5	794767
Total Lead (Pb)	ug/g	75	130	130	1	794767
Total Molybdenum (Mo)	ug/g	0.6	ND	0.6	0.5	794767
Total Nickel (Ni)	ug/g	16	60	15	0.5	794767
Total Selenium (Se)	ug/g	ND	ND	ND	1	794767
Total Silver (Ag)	ug/g	25	16	0.6	0.3	794767
Total Thallium (Tl)	ug/g	ND	ND	ND	1	794767
Total Vanadium (V)	ug/g	14	18	23	0.5	794767
Total Zinc (Zn)	ug/g	230	200	1800	3	794767
METALS						
Chromium (VI)	ug/g	ND	ND	ND	0.05	793350

ND = Not detected
 QC Batch = Quality Control Batch

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

SEMI-VOLATILE ORGANICS BY GC-MS (SOLID)

Maxxam ID		H45702	H45704		
Sampling Date		2005/07/28	2005/07/28		
COC Number		357540	357540		
	Units	BH210 (6 TO 8)	BH310 (6 TO 8)	DL	QC Batch

PAHs					
Acenaphthene	ug/g	ND	ND	0.01	794181
Acenaphthylene	ug/g	ND	ND	0.005	794181
Anthracene	ug/g	ND	ND	0.005	794181
Benzo(a)anthracene	ug/g	ND	ND	0.01	794181
Benzo(a)pyrene	ug/g	ND	ND	0.005	794181
Benzo(b)fluoranthene	ug/g	ND	ND	0.005	794181
Benzo(g,h,i)perylene	ug/g	ND	ND	0.02	794181
Benzo(k)fluoranthene	ug/g	ND	ND	0.01	794181
Chrysene	ug/g	ND	ND	0.01	794181
Dibenzo(a,h)anthracene	ug/g	ND	ND	0.02	794181
Fluoranthene	ug/g	ND	ND	0.005	794181
Fluorene	ug/g	ND	ND	0.005	794181
Indeno(1,2,3-cd)pyrene	ug/g	ND	ND	0.02	794181
1-Methylnaphthalene	ug/g	ND	ND	0.005	794181
2-Methylnaphthalene	ug/g	ND	ND	0.005	794181
Naphthalene	ug/g	ND	ND	0.005	794181
Phenanthrene	ug/g	ND	ND	0.005	794181
Pyrene	ug/g	ND	ND	0.005	794181
Surrogate Recovery (%)					
2-Fluorobiphenyl	%	93	89		794181
D14-Terphenyl (FS)	%	97	99		794181
D5-Nitrobenzene	%	72	72		794181
ND = Not detected QC Batch = Quality Control Batch					

Maxxam Job #: A572723
 Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
 Client Project #: SW0050707
 Project name:
 Sampler Initials:

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		H45702	H45704		
Sampling Date		2005/07/28	2005/07/28		
COC Number		357540	357540		
	Units	BH210 (6 TO 8)	BH310 (6 TO 8)	DL	QC Batch

F1 PHC and BTEX					
Benzene	ug/g	ND	ND	0.02	794242
Toluene	ug/g	ND	ND	0.02	794242
Ethylbenzene	ug/g	ND	ND	0.02	794242
o-Xylene	ug/g	ND	ND	0.02	794242
p+m-Xylene	ug/g	ND	ND	0.04	794242
Total Xylenes	ug/g	ND	ND	0.04	794242
F1 (C6-C10)	ug/g	ND	ND	10	794242
F1 (C6-C10) - BTEX	ug/g	ND	ND	10	794242
F2-F4 PHC					
F2 (C10-C16 Hydrocarbons)	ug/g	ND	ND	10	794043
F3 (C16-C34 Hydrocarbons)	ug/g	ND	ND	10	794043
F4 (C34-C50 Hydrocarbons)	ug/g	ND	ND	10	794043
Reached Baseline at C50	ug/g	YES	YES	N/A	794043
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	106	106		794242
4-Bromofluorobenzene	%	95	94		794242
D10-Ethylbenzene	%	97	94		794242
D4-1,2-Dichloroethane	%	91	80		794242
o-Terphenyl	%	107	107		794043
ND = Not detected QC Batch = Quality Control Batch					

Maxxam Job #: A572723
Report Date: 2005/08/10

AMEC Earth & Environmental Ltd
Client Project #: SW0050707
Project name:
Sampler Initials:

SEMI-VOLATILE ORGANICS BY GC-MS (SOLID)

PAH Compounds in Soil by GC/MS (SIM):

Duplicate results for QC batch 794181 exceeded RPD acceptance criteria. This is likely due to sample heterogeneity.

Results relate only to the items tested.

AMEC Earth & Environmental Ltd
Attention: Susan Pelton-Klunder
Client Project #: SW0050707
P.O. #:
Project name:

Quality Assurance Report
Maxxam Job Number: MA572723

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
793350 TJO	MATRIX SPIKE	Chromium (VI)	2005/08/04		114	%	75 - 125
	QC STANDARD	Chromium (VI)	2005/08/04		101	%	85 - 115
	Spiked Blank	Chromium (VI)	2005/08/04		94	%	75 - 125
	Method Blank	Chromium (VI)	2005/08/04	ND, DL=0.05		ug/g	
	RPD	Chromium (VI)	2005/08/04	NC		%	35
793514 TJO	MATRIX SPIKE	Chromium (VI)	2005/08/05		93	%	75 - 125
	QC STANDARD	Chromium (VI)	2005/08/05		101	%	85 - 115
	Spiked Blank	Chromium (VI)	2005/08/05		96	%	75 - 125
	Method Blank	Chromium (VI)	2005/08/05	ND, DL=0.05		ug/g	
	RPD	Chromium (VI)	2005/08/05	NC		%	35
794043 BWW	MATRIX SPIKE	o-Terphenyl	2005/08/08		107	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2005/08/08		111	%	60 - 140
		F3 (C16-C34 Hydrocarbons)	2005/08/08		111	%	60 - 140
		F4 (C34-C50 Hydrocarbons)	2005/08/08		111	%	60 - 140
	Spiked Blank	o-Terphenyl	2005/08/08		101	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2005/08/08		96	%	60 - 140
		F3 (C16-C34 Hydrocarbons)	2005/08/08		96	%	60 - 140
		F4 (C34-C50 Hydrocarbons)	2005/08/08		96	%	60 - 140
	Method Blank	o-Terphenyl	2005/08/08		109	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2005/08/08	ND, DL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2005/08/08	ND, DL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2005/08/08	ND, DL=10		ug/g	
	RPD	F2 (C10-C16 Hydrocarbons)	2005/08/08	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2005/08/08	NC		%	50
		F4 (C34-C50 Hydrocarbons)	2005/08/08	NC		%	50
	Reached Baseline at C50	2005/08/08	NC		%	50	
794181 MWG	MATRIX SPIKE	2-Fluorobiphenyl	2005/08/08		82	%	30 - 130
		D14-Terphenyl (FS)	2005/08/08		90	%	30 - 130
		D5-Nitrobenzene	2005/08/08		61	%	30 - 130
		Acenaphthene	2005/08/08		82	%	30 - 130
		Acenaphthylene	2005/08/08		82	%	30 - 130
		Anthracene	2005/08/08		91	%	30 - 130
		Benzo(a)anthracene	2005/08/08		84	%	30 - 130
		Benzo(a)pyrene	2005/08/08		76	%	30 - 130
		Benzo(b/j)fluoranthene	2005/08/08		81	%	30 - 130
		Benzo(g,h,i)perylene	2005/08/08		94	%	30 - 130
		Benzo(k)fluoranthene	2005/08/08		90	%	30 - 130
		Chrysene	2005/08/08		75	%	30 - 130
		Dibenzo(a,h)anthracene	2005/08/08		88	%	30 - 130
		Fluoranthene	2005/08/08		37	%	30 - 130
		Fluorene	2005/08/08		79	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2005/08/08		89	%	30 - 130
		1-Methylnaphthalene	2005/08/08		88	%	30 - 130
		2-Methylnaphthalene	2005/08/08		84	%	30 - 130
		Naphthalene	2005/08/08		74	%	30 - 130
		Phenanthrene	2005/08/08		35	%	30 - 130
		Pyrene	2005/08/08		54	%	30 - 130
	Spiked Blank	2-Fluorobiphenyl	2005/08/08		99	%	30 - 130
		D14-Terphenyl (FS)	2005/08/08		97	%	30 - 130
		D5-Nitrobenzene	2005/08/08		77	%	30 - 130
		Acenaphthene	2005/08/08		92	%	30 - 130
		Acenaphthylene	2005/08/08		85	%	30 - 130
		Anthracene	2005/08/08		110	%	30 - 130
		Benzo(a)anthracene	2005/08/08		102	%	30 - 130
		Benzo(a)pyrene	2005/08/08		92	%	30 - 130
		Benzo(b/j)fluoranthene	2005/08/08		96	%	30 - 130

Mississauga Env: 6740 Campobello Road L5N 2L8 Telephone(905) 817-5700 FAX(905) 817-5777

AMEC Earth & Environmental Ltd
Attention: Susan Pelton-Klunder
Client Project #: SW0050707
P.O. #:
Project name:

Quality Assurance Report (Continued)

Maxxam Job Number: MA572723

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits		
794181 MWG	Spiked Blank	Benzo(g,h,i)perylene	2005/08/08		102	%	30 - 130		
		Benzo(k)fluoranthene	2005/08/08		92	%	30 - 130		
		Chrysene	2005/08/08		101	%	30 - 130		
		Dibenzo(a,h)anthracene	2005/08/08		94	%	30 - 130		
		Fluoranthene	2005/08/08		97	%	30 - 130		
		Fluorene	2005/08/08		87	%	30 - 130		
		Indeno(1,2,3-cd)pyrene	2005/08/08		97	%	30 - 130		
		1-Methylnaphthalene	2005/08/08		97	%	30 - 130		
		2-Methylnaphthalene	2005/08/08		93	%	30 - 130		
		Naphthalene	2005/08/08		93	%	30 - 130		
		Phenanthrene	2005/08/08		102	%	30 - 130		
		Pyrene	2005/08/08		97	%	30 - 130		
		Method Blank	2-Fluorobiphenyl	2005/08/08		89	%	30 - 130	
			D14-Terphenyl (FS)	2005/08/08		98	%	30 - 130	
			D5-Nitrobenzene	2005/08/08		78	%	30 - 130	
			Acenaphthene	2005/08/08	ND, DL=0.01			ug/g	
			Acenaphthylene	2005/08/08	ND, DL=0.005			ug/g	
			Anthracene	2005/08/08	ND, DL=0.005			ug/g	
	Benzo(a)anthracene		2005/08/08	ND, DL=0.01			ug/g		
	Benzo(a)pyrene		2005/08/08	ND, DL=0.005			ug/g		
	Benzo(b,f)fluoranthene		2005/08/08	ND, DL=0.005			ug/g		
	Benzo(g,h,i)perylene		2005/08/08	ND, DL=0.02			ug/g		
	Benzo(k)fluoranthene		2005/08/08	ND, DL=0.01			ug/g		
	Chrysene		2005/08/08	ND, DL=0.01			ug/g		
	Dibenzo(a,h)anthracene		2005/08/08	ND, DL=0.02			ug/g		
	Fluoranthene		2005/08/08	ND, DL=0.005			ug/g		
	Fluorene		2005/08/08	ND, DL=0.005			ug/g		
	Indeno(1,2,3-cd)pyrene		2005/08/08	ND, DL=0.02			ug/g		
	RPD		1-Methylnaphthalene	2005/08/08	ND, DL=0.005			ug/g	
			2-Methylnaphthalene	2005/08/08	ND, DL=0.005			ug/g	
		Naphthalene	2005/08/08	ND, DL=0.005			ug/g		
		Phenanthrene	2005/08/08	ND, DL=0.005			ug/g		
		Pyrene	2005/08/08	ND, DL=0.005			ug/g		
		D14-Terphenyl (FS)	2005/08/08	3.0		%		N/A	
		Acenaphthene	2005/08/08	NC		%		50	
		Acenaphthylene	2005/08/08	14.9		%		50	
Anthracene		2005/08/08	50.8 (1)		%		50		
Benzo(a)anthracene		2005/08/08	18.0		%		50		
Benzo(a)pyrene		2005/08/08	12.4		%		50		
Benzo(b,f)fluoranthene		2005/08/08	13.1		%		50		
Benzo(g,h,i)perylene		2005/08/08	7.5		%		50		
Benzo(k)fluoranthene		2005/08/08	8.4		%		50		
Chrysene		2005/08/08	15.1		%		50		
Dibenzo(a,h)anthracene		2005/08/08	NC		%		50		
Fluoranthene		2005/08/08	30.6		%		50		
Fluorene		2005/08/08	81.9 (1)		%		50		
Indeno(1,2,3-cd)pyrene		2005/08/08	8.8		%		50		
1-Methylnaphthalene		2005/08/08	23.4		%		50		
2-Methylnaphthalene		2005/08/08	21.6		%		50		
Naphthalene	2005/08/08	NC		%		50			
Phenanthrene	2005/08/08	55.8 (1)		%		50			
Pyrene	2005/08/08	22.7		%		50			
794206 SPU	RPD	Moisture	2005/08/05	5.0		%	50		
		Moisture	2005/08/05	1.4		%	50		
794242 GBA	MATRIX SPIKE	1,4-Difluorobenzene	2005/08/08		102	%	60 - 140		
		4-Bromofluorobenzene	2005/08/08		95	%	60 - 140		

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AMEC Earth & Environmental Ltd
Attention: Susan Pelton-Klunder
Client Project #: SW0050707
P.O. #:
Project name:

Quality Assurance Report (Continued)

Maxxam Job Number: MA572723

QA/QC Batch	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits	
Num Init			yyyy/mm/dd					
794242 GBA	MATRIX SPIKE	D10-Ethylbenzene	2005/08/08		91	%	30 - 130	
		D4-1,2-Dichloroethane	2005/08/08		97	%	60 - 140	
		Benzene	2005/08/08		103	%	60 - 140	
		Toluene	2005/08/08		103	%	60 - 140	
		Ethylbenzene	2005/08/08		104	%	60 - 140	
		o-Xylene	2005/08/08		106	%	60 - 140	
		p+m-Xylene	2005/08/08		104	%	60 - 140	
		F1 (C6-C10)	2005/08/08		81	%	60 - 140	
		Spiked Blank	1,4-Difluorobenzene	2005/08/08		102	%	60 - 140
			4-Bromofluorobenzene	2005/08/08		96	%	60 - 140
	D10-Ethylbenzene		2005/08/08		91	%	30 - 130	
	D4-1,2-Dichloroethane		2005/08/08		98	%	60 - 140	
	Benzene		2005/08/08		106	%	60 - 140	
	Toluene		2005/08/08		104	%	60 - 140	
	Ethylbenzene		2005/08/08		105	%	60 - 140	
	o-Xylene		2005/08/08		107	%	60 - 140	
	p+m-Xylene		2005/08/08		107	%	60 - 140	
	F1 (C6-C10)		2005/08/08		82	%	60 - 140	
	Method Blank	1,4-Difluorobenzene	2005/08/08		105	%	60 - 140	
		4-Bromofluorobenzene	2005/08/08		97	%	60 - 140	
		D10-Ethylbenzene	2005/08/08		89	%	30 - 130	
		D4-1,2-Dichloroethane	2005/08/08		90	%	60 - 140	
		Benzene	2005/08/08	ND, DL=0.02			ug/g	
		Toluene	2005/08/08	ND, DL=0.02			ug/g	
		Ethylbenzene	2005/08/08	ND, DL=0.02			ug/g	
		o-Xylene	2005/08/08	ND, DL=0.02			ug/g	
		p+m-Xylene	2005/08/08	ND, DL=0.04			ug/g	
		Total Xylenes	2005/08/08	ND, DL=0.04			ug/g	
	RPD	F1 (C6-C10)	2005/08/08	ND, DL=10			ug/g	
		F1 (C6-C10) - BTEX	2005/08/08	ND, DL=10			ug/g	
		Benzene	2005/08/08	NC			%	50
		Toluene	2005/08/08	NC			%	50
		Ethylbenzene	2005/08/08	NC			%	50
		o-Xylene	2005/08/08	NC			%	50
		p+m-Xylene	2005/08/08	NC			%	50
		Total Xylenes	2005/08/08	NC			%	50
		F1 (C6-C10)	2005/08/08	NC			%	50
		F1 (C6-C10) - BTEX	2005/08/08	NC			%	50
	794685 LS	QC STANDARD	pH	2005/08/08		99	%	90 - 110
		RPD	pH	2005/08/08	0.7		%	35
794689 LS	QC STANDARD	Conductivity	2005/08/08		100	%	85 - 115	
	Method Blank	Conductivity	2005/08/08	ND, DL=2		umho/cm		
794767 GBU	RPD	Conductivity	2005/08/08	0.5		%	35	
	MATRIX SPIKE	Total Antimony (Sb)	2005/08/08		96	%	75 - 125	
		Total Arsenic (As)	2005/08/08		108	%	75 - 125	
		Total Beryllium (Be)	2005/08/08		100	%	75 - 125	
		Total Cobalt (Co)	2005/08/08		94	%	75 - 125	
		Total Molybdenum (Mo)	2005/08/08		102	%	75 - 125	
		Total Selenium (Se)	2005/08/08		93	%	75 - 125	
		Total Silver (Ag)	2005/08/08		95	%	75 - 125	
		Total Thallium (Tl)	2005/08/08		76	%	75 - 125	
		Total Vanadium (V)	2005/08/08		101	%	75 - 125	
	QC STANDARD	Total Arsenic (As)	2005/08/08		114	%	30 - 170	
		Total Barium (Ba)	2005/08/08		107	%	70 - 130	
		Total Chromium (Cr)	2005/08/08		90	%	40 - 160	
		Total Cobalt (Co)	2005/08/08		103	%	75 - 125	

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Quality Assurance Report (Continued)

Maxxam Job Number: MA572723

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
794767 GBU	QC STANDARD	Total Copper (Cu)	2005/08/08		106	%	73 - 127
		Total Lead (Pb)	2005/08/08		103	%	54 - 146
		Total Nickel (Ni)	2005/08/08		104	%	61 - 139
		Total Vanadium (V)	2005/08/08		110	%	50 - 150
		Total Zinc (Zn)	2005/08/08		103	%	72 - 128
	Method Blank	Total Antimony (Sb)	2005/08/08	ND, DL=1		ug/g	
		Total Arsenic (As)	2005/08/08	ND, DL=1		ug/g	
		Total Barium (Ba)	2005/08/08	ND, DL=0.5		ug/g	
		Total Beryllium (Be)	2005/08/08	ND, DL=0.5		ug/g	
		Total Cadmium (Cd)	2005/08/08	ND, DL=0.3		ug/g	
		Total Chromium (Cr)	2005/08/08	ND, DL=0.5		ug/g	
		Total Cobalt (Co)	2005/08/08	ND, DL=0.5		ug/g	
		Total Copper (Cu)	2005/08/08	ND, DL=0.5		ug/g	
		Total Lead (Pb)	2005/08/08	ND, DL=1		ug/g	
		Total Molybdenum (Mo)	2005/08/08	ND, DL=0.5		ug/g	
		Total Nickel (Ni)	2005/08/08	ND, DL=0.5		ug/g	
		Total Selenium (Se)	2005/08/08	ND, DL=1		ug/g	
		Total Silver (Ag)	2005/08/08	ND, DL=0.3		ug/g	
		Total Thallium (Tl)	2005/08/08	ND, DL=1		ug/g	
		Total Vanadium (V)	2005/08/08	ND, DL=0.5		ug/g	
		Total Zinc (Zn)	2005/08/08	ND, DL=3		ug/g	
	RPD	Total Antimony (Sb)	2005/08/08	1.9		%	20
		Total Arsenic (As)	2005/08/08	7.7		%	20
		Total Barium (Ba)	2005/08/08	10.5		%	20
		Total Beryllium (Be)	2005/08/08	NC		%	20
		Total Cadmium (Cd)	2005/08/08	12.0		%	20
		Total Chromium (Cr)	2005/08/08	6.8		%	20
		Total Cobalt (Co)	2005/08/08	7.9		%	20
		Total Copper (Cu)	2005/08/08	6.2		%	20
		Total Lead (Pb)	2005/08/08	5.2		%	20
		Total Molybdenum (Mo)	2005/08/08	8.0		%	20
		Total Nickel (Ni)	2005/08/08	4.6		%	20
		Total Selenium (Se)	2005/08/08	NC		%	20
		Total Silver (Ag)	2005/08/08	1.0		%	20
		Total Thallium (Tl)	2005/08/08	NC		%	20
		Total Vanadium (V)	2005/08/08	6.8		%	20
		Total Zinc (Zn)	2005/08/08	5.5		%	20

ND = Not detected

N/A = Not Applicable

NC = Non-calculable

RPD = Relative Percent Difference

QC Standard = Quality Control Standard

SPIKE = Fortified sample

(1) Please note that the recovery of some compounds are outside control limits however the overall quality control for this analysis meets our acceptability criteria.

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LIMITATIONS INTRUSIVE INVESTIGATIONS

1. The work performed in this report was carried out in accordance with the Standard Terms and Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract.
2. The report has been prepared in accordance with generally accepted environmental study and/or engineering practices. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.
3. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site, which were unavailable for direct observation, reasonably beyond the control of AMEC Earth & Environmental.
4. The objective of this report was to assess the environmental conditions at the site, given the context of our contract, with respect to existing environmental regulations within the applicable jurisdiction. Compliance of past owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.
5. The site history performed herein relies in information supplied by others, such as local, provincial and federal agencies as well as plant personnel. No attempt has been made to independently verify the accuracy of such information, unless specifically noted in our report.
6. Our visual observations relating to potential contaminant materials in the environment at the site are described in this report. Where testing was performed, it was executed in accordance with our contract for these services. It should be noted that other compounds or materials not tested for may be present in the site environment.
7. The conclusions of this report are based, in part, on the information provided by others. The possibility remains that unexpected environmental conditions may be encountered at the site in locations not specifically investigated. Should such an event occur, AMEC Earth & Environmental must be notified in order that we may determine if modifications to our conclusions are necessary.
8. The utilization of AMEC Earth & Environmental services during the implementation of any remedial measures will allow AMEC Earth & Environmental to observe compliance with the conclusions and recommendations contained herein. It will also provide for changes as necessary to suit field conditions as they are encountered.
9. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. AMEC Earth & Environmental accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.