

**PHASE II
ENVIRONMENTAL SITE ASSESSMENT**

**CARTE INTERNATIONAL INC.
1995 LOGAN AVENUE
WINNIPEG, MANITOBA**

Prepared for:

CARTE INTERNATIONAL INC.
1995 Logan Avenue
Winnipeg, Manitoba
R2R 0H8

Attention: Mr. Gary Mowat

Pinchin Project No. 35204

June 22, 2006

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EXECUTIVE SUMMARY

Pinchin Environmental Ltd. (Pinchin) was retained by Carte International Inc. (Carte) to conduct a Phase II Environmental Site Assessment (ESA) of 1995 Logan Avenue in Winnipeg, Manitoba (hereafter referred to as the "Site").

The purpose of this Phase II ESA was to determine if the remediation conducted at the Site in 1996 removed the impacted soil to current day guidelines and criteria. The current ESA involved utility clearances, borehole drilling, soil sampling, consulting services, laboratory analysis, and reporting.

On the basis of the information gathered to-date, as a part of this Phase II ESA for the Site, the significant findings were identified as noted below.

- The 1996 remediation conducted at the Site by Wardrop has removed the majority of impacted soil from the Site and has removed the source of the hydrocarbon impacts. Residual impacts remain on-Site as determined by this Phase II ESA. The soil samples submitted for laboratory analyses do not exceed the most stringent applicable human health guideline, the vapour inhalation (indoor) guideline used to protect personnel working within a slab-on-grade structure from any health effects from hydrocarbon infiltration through openings and cracks within the concrete slab.
- Recovery wells located south and north of the original excavation are emptied biannually by Carte. Minor amounts of hydrocarbon sheen were reported within the most southern well (located approximately 10 m from the location of BH-4). This well was being emptied the day of Pinchin's Phase II ESA. Ms. Joanne Lanoie of Pinchin observed only small amounts of hydrocarbons within the recovery well.
- Monitoring wells located within the building and outdoors are monitored biannually by Carte. The readings obtained within the monitoring wells are recorded. The most recent readings were provided to Pinchin to review. No significant findings were noted.
- Manitoba Conservation was contacted via telephone regarding the Site. Mr. Dean Kasur of the Contaminated Sites program has no concerns regarding the residual material remaining on-Site. A copy of this report should be forwarded to Mr. Kasur for review along with a request for Manitoba Conservation to issue a closure letter for the Site.
- Given the current and future Site use, the fact that the source of the impact has been removed, that only residual impacts remain on-Site and that all of the samples analyzed had concentrations of petroleum hydrocarbon parameters below regulatory criteria applicable to the protection of human health, it is Pinchin's opinion that no further environmental work is required at the Site.

On the basis of the information gathered as a part of this Phase II ESA for the Site, no further action is recommended at this time.

1. PURPOSE OF THE STUDY

Pinchin Environmental Ltd. (Pinchin) was retained by Carte International Inc. (Carte) to conduct a Phase II Environmental Site Assessment (ESA) of 1995 Logan Avenue in Winnipeg, Manitoba (hereafter referred to as the "Site").

The purpose of this Phase II ESA was to determine if the remediation conducted at the Site in 1996 removed the impacted soil to current day guidelines and criteria. The current ESA involved utility clearances, borehole drilling, soil sampling, consulting services, laboratory analysis, and reporting.

2. SITE DESCRIPTION

Carte manufactures single-phase and three-phase pole and pad-mounted transformers, network transformers, submersible transformers, and small power transformers on Site. The Site building occupies approximately 29% of the Site and is located within an industrial area of Winnipeg, Manitoba.

A Site location plan and borehole (BH) location plan are provided as Figures 1 and 2 in Appendix I.

The closest surface body of water is a retention pond approximately 0.25 km north of the Site. Omand's Creek is located approximately 1.5 km southwest of the Site and the Red River is located approximately 7 km east of the Site.

Groundwater monitoring wells were installed on-Site and monitored by Wardrop Engineering Ltd. (Wardrop) as part of the investigation and remediation conducted on the Site. According to the report, Wardrop 1996a, groundwater flow is in a southerly direction. Specifically, groundwater on the east portion of the Site was moving to the southeast and groundwater on the west portion of the Site was moving to the southwest.

The direction of groundwater flow can be influenced by the presence of underground utilities and underground building structures. Specifically, the gravel pack used around utilities, such as storm sewers, can act as interceptors and redirect groundwater flow along the direction of the pipe.

3. PREVIOUS REPORTS

The following reports were reviewed:

- Pinchin Environmental Ltd., Revised Phase I Environmental Site Assessment, Carte International Inc., 1995 Logan Avenue, Winnipeg, Manitoba, 2006 (Pinchin, 2006).

The Phase I ESA conducted by Pinchin (Pinchin, 2006) reviewed previous reports related to a transformer oil spill that occurred at the site in 1987 and subsequent environmental assessments and remedial work. The report (Pinchin, 2006) concluded that the 1996 remediation appears to have removed the majority of impacted soil from the Site. Since the time of the remediation (1996), the manners in which petroleum hydrocarbon impacts are analyzed and regulated have changed. For this reason it is not possible to directly compare analytical results obtained during the 1996 remediation with current regulatory criteria. However, based on the soil sample results from the Phase II ESA and the closure samples from the remediation walls and base, it appears that the residual impacts present at the Site are such that they would likely be within current criteria based on the information supplied by the Wardrop reports. This Phase II ESA was initiated to confirm or deny that residual impacts associated with the 1987 transformer oil spill are less than current applicable regulatory criteria.

4. SCOPE OF WORK

The scope of work for the Phase II ESA involved the following:

- on-Site supervision of utility clearances;
- advancement of four BHs;
- submission of four soil samples for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and petroleum hydrocarbons (fractions F1 thru F4) analysis; and
- consulting and reporting.

The locations of the areas investigated are shown on Figure No. 2 provided in Appendix I.

5. REGULATORY FRAMEWORK

The ESA was conducted in general compliance with Canada Standards Association (CSA) "Z769-00 Phase II Environmental Site Assessment," dated March 2000 and Manitoba Conservation's "Guideline for Environmental Site Investigations in Manitoba," dated June 1998.

Mr. Dean Kasur and Mr. Randy Webber of Manitoba Conservation were contacted regarding the applicable exposure pathways specific to the Site. According to Manitoba Conservation, the vapour inhalation pathway is the most applicable pathway as described within the Tables below.

Manitoba Conservation has adopted the Canadian Council of the Ministers of the Environment (CCME) "*Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil*" dated January 2001 for assessing sites with PHC impacts. The Canada-Wide Standard (CWS) is a risk-based remedial standard used to develop site-specific guidelines for PHC impacts in soil based on land usage and applicable environmental and human health receptors and/or exposure pathways. The Tier 2 Site specific analyses of applicable pathways are evaluated in Table 1.

Table 1 Tier 2 Site Specific Pathway Analysis Canada Wide Standards for Petroleum Hydrocarbons in Soil 1995 Logan Avenue, Winnipeg, Manitoba		
Pathway	Applicability to the Site	Reason for rejection
Soil ingestion	Not Applicable	Asphalt cover limits contact with the soil.
Dermal contact	Not Applicable	Asphalt cover limits contact with the soil.
Vapour inhalation (indoor)	Applicable	
Protection of Potable Ground Water	Not applicable	Potable water in the area of the Site is not supplied from groundwater aquifers.
Protection of Potable Ground Water for aquatic life	Not applicable	Nearest surface water body is greater than 10 m from the Site.
Nutrient Cycling	Applicable	
Eco soil contact	Not Applicable	No eco soil contact beneath building foundation.
* Pathway in bold font [vapour inhalation (indoor)] represents the most stringent criteria of the applicable exposure pathways and thus is referenced in this report		

Criteria pertaining to BTEX are contained within the CCME "*Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health*" Update 4.0 dated December, 2004. Manitoba Conservation has adopted the 10^{-6} incremental cancer risk guidelines presented in this document which have been referenced in this report. The Tier 2 site specific analyses of applicable pathways are evaluated in Table 2.

Table 2 Tier 2 Site Specific Pathway Analysis Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health 1995 Logan Avenue, Winnipeg, Manitoba		
Pathway	Applicability to the Site	Reason for Rejection
Soil Quality Guideline for Human Health		
Soil ingestion	Not Applicable	Asphalt cover limits contact with the soil.
Soil dermal contact	Not Applicable	Asphalt cover limits contact with the soil.
Soil inhalation	Not Applicable	Asphalt cover limits contact with the soil.
Inhalation of indoor air (basement)	Not Applicable	No buildings with basements are present at the Site.
Inhalation of indoor air (slab-on-grade)	Applicable	
Off-Site migration check	Applicable	
Groundwater check (drinking water)	Not Applicable	Potable water in the area of the Site is not supplied from groundwater aquifers.
Produce, meat and milk check	Not Applicable	Current land use is not agricultural.
Soil Quality Guideline for Environmental Health		
Soil contact	Not Applicable	No eco soil contact beneath building foundation.
Soil and food ingestion	Not Applicable	No eco soil contact beneath building foundation.
Nutrient and energy cycling check	Applicable	
Off-Site migration check	Applicable	
Groundwater check (livestock)	Not Applicable	Groundwater in the area of the Site is not used for livestock watering.
Groundwater check (aquatic life)	Not Applicable	Nearest surface water body is greater than 10m from the Site.
* Pathways in bold font Inhalation of Indoor Air (slab on grade) and Soil Contact represent the most stringent criteria of the applicable exposure pathways and thus are referenced in this report.		

The current and anticipated future use of the Site is for industrial purposes; as a result, the **industrial guidelines** are referenced for each document. In addition, the soils in the area are assumed to be fine grained comprising of mainly clays and silts. As a result the most stringent criteria (applicable to the Site) representing fine-grained soils on industrial properties are referenced in this report.

6. METHODOLOGY

Pinchin's investigation comprised the following:

6.1 Pre-subsurface Investigation Activities

Utilities were cleared for Manitoba Hydro (gas and electrical), MTS (telephone), Shaw Cable, and the City of Winnipeg sewer and waste.

6.2 Organic Vapour Monitoring

An organic vapour meter (OVM) calibrated to Hexane, which measures organic vapours based on the principle of flame ionization detection (FID), was used during this investigation. The OVM was used to measure vapours produced in the open boreholes and from the soil samples. Soil subjected to organic vapour monitoring was prepared by placing approximately 250 to 300 ml of the sample into a sealed plastic sampling bag. The soil was allowed to warm to room temperature. Monitoring was accomplished by puncturing and inserting the OVM sampling probe into the bag while manually agitating the soil. The highest concentration observed was recorded. Hydrocarbon vapour concentrations between 100% of the lower explosive limit (LEL) and 600% LEL may explode if exposed to an ignition source. One percent (1%) LEL is the equivalent of approximately 125 parts per million (ppm). Organic concentrations of 100 ppm or greater suggest the presence of petroleum hydrocarbons.

6.3 Soil Sampling Program

Maple Leaf Drilling Ltd. provided and operated the Cricket B20 soil drilling rig (mounted on skids) on June 7, 2006. The drilling rig was equipped with 150 mm diameter solid-stem, continuous-flight augers. Maple Leaf Drilling Ltd. advanced a total of three BHs, two outdoors and one indoors.

Prior to arriving on-Site, Maple Leaf Drilling Ltd. decontaminated the auger flights with phosphate-free detergent and hot water to minimize cross-contamination. The lead auger flight was changed after each borehole.

In addition to the BHs advanced by Maple Leaf Drilling, Pinchin advanced one hand augered borehole.

Disposable latex sampling gloves were worn during sampling and were changed between sampling events. Soil samples selected for possible laboratory analysis were placed in laboratory supplied glass 125 ml wide mouth sampling jars. The jars were completely filled (no headspace) to minimize losses of volatile contaminants.

The soils encountered were generally logged according to the Unified Soil Classification System with any abnormalities in colour, composition, and odour noted. The BH logs are provided in Appendix III.

BH positions were based on the highest vapour readings remaining on-Site as provided by the Wardrop remediation reports as well as the accessibility of these locations. BH locations have been provided in Figure 2 within Appendix I.

6.4 Analytical Program

The selection of soil samples for analysis was based on the organic vapour results, visual and olfactory examination and changes in soil stratigraphy. Four soil samples were analyzed for BTEX and petroleum hydrocarbon fractions F1 thru F4. The analytical results were then correlated with soil sample vapour concentrations to assess for the magnitude and extent of any potential impact.

All of the samples were kept cool (approximately 4 °C) prior to being shipped to ALS Laboratory Group (formerly Enviro-Test Laboratories) in Winnipeg, Manitoba for analysis.

6.5 Monitoring Wells

Monitoring wells are present on-Site and are monitored by Carte bi-annually. Additional monitoring wells were not installed as part of this Phase II ESA.

7. FINDINGS

The following sections present the findings of Pinchin's Phase II ESA.

7.1 Underground Utilities

Utilities were cleared for Manitoba Hydro (gas and electrical), MTS (telephone), Shaw Cable and the City of Winnipeg sewer and waste. No utilities were identified within the areas to be drilled. Mr. Kahowchyk of Carte indicated that private utilities were not located in the areas to be drilled.

7.2 Soil Stratigraphy and Soil Sampling Observations

The soil stratigraphy generally comprised of 0.15 m of concrete followed by a sand and gravel fill to approximately 0.5 m below surface grade (bsg). This fill was followed by black clay with high organic content to a depth of approximately 1.0 m bsg. Silt layers and/or silty clay was observed at various depths and ranged from 0.1 m to 0.7 m thick. No silt layer was observed within BH 4. A stiff olive grey to olive green clay with high plasticity was then observed to the end of each BH, approximately 4.5 m bsg.

Hydrocarbon odours and staining were noted within BH 4.

7.3 Organic Vapour Analysis

Organic vapour analysis was conducted following sampling. The highest organic vapour reading obtained from the soil samples taken during the Phase II ESA drilling program for each BH are as follows: BH-1: 200 ppm; BH-2: 95 ppm; BH-3: 675 ppm; and BH-4: 413 ppm. The results are plotted on the individual borehole logs, provided in Appendix III.

7.4 Soil Sample Analytical Results

Soil samples collected from BH-1 at 2.2 m bsg, BH-3 at 1.2 m bsg, BH-4 at 0.75 m bsg and BH-4 at 1.0 m bsg were submitted for BTEX and petroleum hydrocarbon analysis. Chemical analysis of the samples revealed that all samples were within applicable CCME criteria. Refer to Table 1 in Appendix II for the summary of laboratory data and refer to Appendix IV for detailed laboratory results, including the QA/QC results.

8. DISCUSSION AND CONCLUSIONS

The 1996 remediation conducted at the Site by Wardrop has removed the majority of impacted soil from the Site and has removed the source of the hydrocarbon impacts. Residual impacts remain on-Site as determined by this Phase II ESA. The soil samples submitted for laboratory analyses do not exceed the most stringent applicable human health guideline, the vapour inhalation (indoor) guideline used to protect personnel working within a slab-on-grade structure from any health effects from hydrocarbon infiltration through openings and cracks within the concrete slab.

Recovery wells located south and north of the original excavation are emptied bi-annually by Carte. Minor amounts of hydrocarbon sheen were reported within the most southern well (located approximately 10 m from the location of BH-4). This well was being emptied the day of Pinchin's Phase II ESA. Ms. Joanne Lanoie of Pinchin observed only small amounts of hydrocarbons within the recovery well.

Monitoring wells located within the building and outdoors are monitored bi-annually by Carte. The readings obtained within the monitoring wells are recorded. The most recent readings were provided to Pinchin to review. No significant findings were noted.

Manitoba Conservation was contacted via telephone regarding the Site. Mr. Dean Kasur of the Contaminated Sites program has no concerns regarding the residual material remaining on-Site. A copy of this report should be forwarded to Mr. Kasur for review along with a request for Manitoba Conservation to issue a closure letter for the Site.

Given the current and future Site use, the fact that the source of the impact has been removed, that only residual impacts remain on-Site and that all of the samples analyzed had concentrations of petroleum hydrocarbon parameters below regulatory criteria applicable to the protection of human health, it is Pinchin's opinion that no further environmental work is required at the Site.

9. RECOMMENDATIONS

On the basis of the information gathered as a part of this Phase II ESA for the Site, no further action is recommended at this time.

10. LIMITATIONS

This Phase II Environmental Site Assessment (ESA) was performed in order to identify *recognized environmental conditions*. The term *recognized environmental conditions* means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations.

No Phase II ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on the property. Performance of this ESA to the standards established by Pinchin is intended to reduce, but not eliminate uncertainty regarding the potential for recognized environmental conditions on the property, and recognizes reasonable limits on time, work scope, and cost.

The Phase II ESA is based on the observations of the assessor, assumed to be correct. Personnel were interviewed and historical data was reviewed. Pinchin has not conducted any independent investigations to confirm the accuracy and completeness of information obtained from personal interviews or other secondary sources.

Pinchin warrants that this Phase II ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Carte requests, as applicable to this property. This report is intended for Carte use only. Any use of this report by a third party, or any reliance on or decisions made based on the findings described in this report, are the sole responsibility of such third parties, and Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted based on this report. No other warranties are implied or expressed.

11. REFERENCES

The following persons or organizations provided information used in this report:

1. CCME, Canadian Environmental Quality Guidelines, 1999;
2. CCME, Canadian Environmental Quality Guidelines, Update 4.0, 2004;
3. CCME, Recommended Canadian Soil Quality Guidelines, March 1997;
4. CSA, Z769-00 Phase II Environmental Site Assessments, 2000;
5. Manitoba Conservation, Guideline for Environmental Site Investigations in Manitoba, June 1998;
6. Pinchin Environmental Ltd., Revised Phase I Environmental Site Assessment, Carte International Inc., 1995 Logan Avenue, Winnipeg, Manitoba, 2006;
7. Wardrop Engineering Inc., Site Remediation 1995 Logan Avenue, Winnipeg, Manitoba, 1996;
8. Wardrop Engineering Inc., Contamination Delineation and Identification Transformer Oil and Diesel Fuel Southwest Plant and Property, 1996;
9. Wardrop Engineering Inc., Phase II Environmental Assessment Transformer Oil Storage Tank Area, 1995; and
10. ENSIS Corporation Inc., Phase I Environmental Site Assessment of Carte International Inc., Winnipeg, Manitoba, 1995.

**Phase II Environmental Site Assessment
Carte International Inc.
1995 Logan Avenue, Winnipeg, Manitoba**

Thank you for this opportunity to be of further service.

Pinchin Environmental Ltd.

Per:

Per:

Original signed by:

Original signed by:

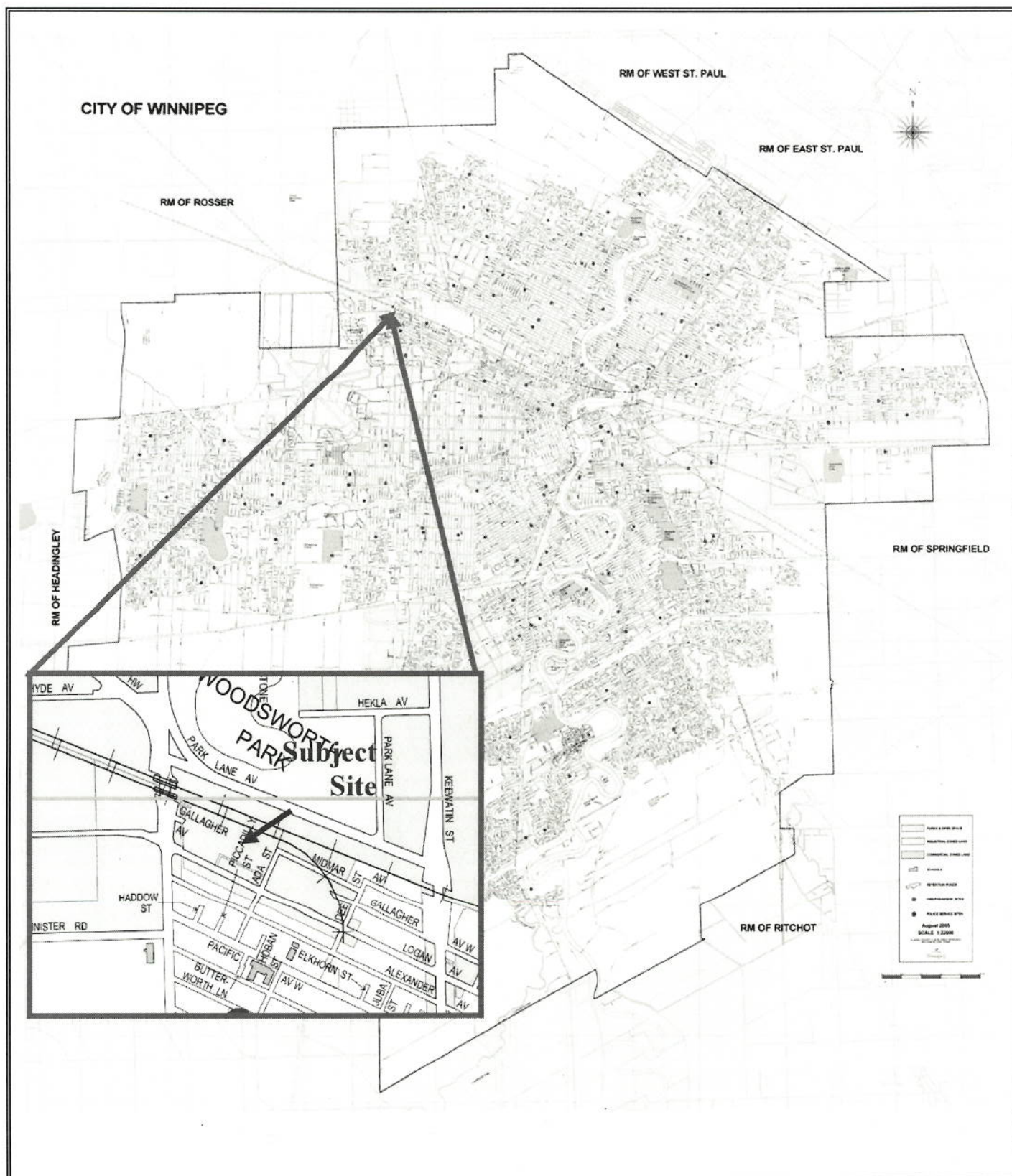
Joanne Lanoie, M.Sc., B.Sc.
Environmental Scientist

Reviewed by: Grant Eftoda, M.Sc. (Eng.)
Manager

File: Job35204 - 1995 Logan - Report - Phase II ESA - June 22, 2006

APPENDIX I

FIGURES



172 Marion Street
Winnipeg, Manitoba R2H 0T4
(204) 452-0983 Fax: (204) 453-0788

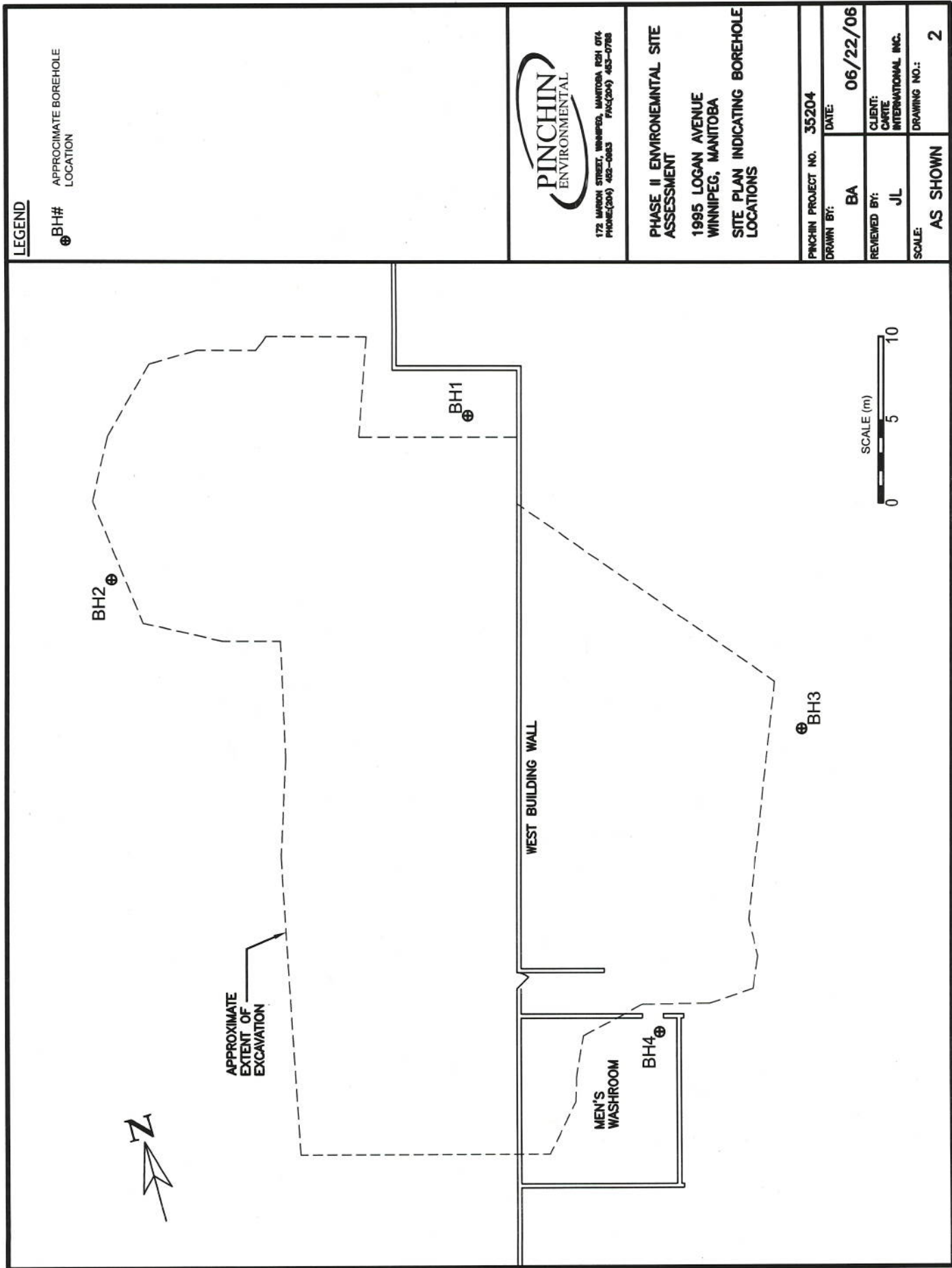
PHASE I ENVIRONMENTAL SITE ASSESSMENT
1995 LOGAN AVENUE
WINNIPEG, MANITOBA

SITE LOCATION MAP

FIGURE NO. 1

Pinchin Environmental Ltd.
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Project No. 35204
Date: June 2006



APPENDIX II

TABLES

Table 1
Laboratory Analysis of Soil Samples for BTEX and PHCs
 Carte International
 1995 Logan Avenue
 Winnipeg, Manitoba

Sample Id	PHCs				BTEX			
	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Xylenes
BH1-2.2	<5	<5	9	7	<0.005	<0.01	<0.01	<0.01
BH3-1.2	<5	<5	9	10	<0.005	<0.01	<0.01	<0.01
BH4-0.75	<5	4000	1800	92	<0.005	0.02	0.06	0.07
BH4-1.0	6	790	270	<5	<0.005	<0.01	0.05	<0.01
Surface Soil < 1.5 m bsg	4600 ¹	25000 ¹	NA ¹	NA ¹	0.28 ²	13000 ²	6500 ²	1600 ²
Subsurface Soil > 1.5 m bsg	4800 ¹	26000 ¹	NA ¹	NA ¹	0.29 ²	13000 ²	6700 ²	1600 ²

Note: All concentrations in micrograms per gram (ug/g) = parts per million (ppm) unless otherwise stated

Concentration in **BOLD** print is in excess of current guideline

F1 = C6 to C10 carbon range

F2 = >C10 to C16 carbon range

F3 = >C16 to C34 carbon range

F4 = C35+ carbon range

1 Vapour Inhalation (indoor), Fine-Grained Soils, CCME Canada Wide Standards for Petroleum Hydrocarbons in Soil - Technical Supplement, 2001

2 Human Health Guidelines/Check Values, Inhalation of Indoor Air, Fine-Grained Soils, CCME Canadian Soil Quality Guideline for the Protection of Environmental and Human Health - Update 4.0, 2004 (10⁻⁶ incremental risk for benzene)

< = less than laboratory's minimum detection limit

APPENDIX III
BOREHOLE LOGS



Borehole: <u>2</u>	Client: Carte International Inc.
Date Drilled: <u>7-Jun-06</u>	Site: <u>1995 Logan Avenue, Winnipeg, Manitoba</u>
Project No.: <u>35204</u>	Location: <u>West of excavation limit.</u>
Elevation (m):	Drilled By: <u>Maple Leaf Drilling</u>
Logged By: <u>JML</u>	Drill Type: <u>Cricket (B-20)</u>
Notes: Vapour Reading in Open Borehole = <u>30 ppm</u>	

Depth (m)	Well Detail	Soil Symbol	Soil Description	Sam. Type	Organic Vapour (ppm)				
					0	100	200	300	400
0			Asphalt	G					
0.3			Sand fill, some gravel						
0.6			Clay	G					
0.9			- high in organics						
1.2			- stones up to 1.5mm, some sand and silt						
1.5			- firm, black	G					
1.8			Silt - brown, moist						
2.1			Clay	G					
2.4			- olive grey						
2.7			- high plasticity						
3			- softer with depth	G ₃					
3.3									
3.6				G _{3.6}					
3.9									
4.2			End of borehole	G					
4.5									

Note: G = GRAB; SS = SPLIT SPOON; ST = SHELBY TUBE



Borehole: 3	Client: Carte International Inc.
Date Drilled: 7-Jun-06	Site: 1995 Logan Avenue, Winnipeg, Manitoba
Project No.: 35204	Location: East of excavation limit
Elevation (mad):	Drilled By: Maple Leaf Drilling
Logged By: JML	Drill Type: Cricket (B-20)
Notes: Vapour Reading in Open Borehole = 870 ppm	

Depth (m)	Well Detail	Soil Symbol	Soil Description	Sam. Type	Organic Vapour (ppm)				
					0	100	200	300	400
0			Concrete	0					
0.3			Sand and gravel fill						
0.6			Clay	0.6					
0.9			- Olive grey, moist	G					
1.2			Silty Clay - black and grey, moist, soft, Some organics	G					
1.5			Silt - loose, wet	G					
1.8			stained grey						
2.1			light brown	G					
2.4			Clay	G					
2.7			- Olive green	G					
3				G					
3.3									
3.6				G					
3.9									
4.2			End of borehole	G					
4.5									

Note: G = GRAB; SS = SPLIT SPOON; ST = SHELBY TUBE



Borehole: <u>4</u>	Client: <u>Carte International Inc.</u>
Date Drilled: <u>7-Jun-06</u>	Site: <u>1995 Logan Avenue, Winnipeg, Manitoba</u>
Project No.: <u>35204</u>	Location: <u>Men's Washroom</u>
Elevation (m):	Drilled By: <u>Pinchin</u>
Logged By: <u>JML</u>	Drill Type: <u>Hand augered</u>
Notes: <u>Vapour Reading in Open Borehole =</u>	

Depth (m)	Well Detail	Soil Symbol	Soil Description	Sam. Type	Organic Vapour (ppm)				
					0	100	200	300	400
0			Concrete		0				
0.3			Sand and gravel fill - moist						
0.6					0.6				
0.9			Clay - black, some silt, moist, organics, <i>Petroleum hydrocarbon odour</i> to wet	G					
1.2				G					
1.5			Clay - olive grey		1.2				
1.8			- moist to wet						
2.1			- high plasticity	G					
2.4			- softer with depth						
2.7				G					
3			end of bore hole	G					
3.3									
3.6									
3.9									
4.2									
4.5									

Note: G = GRAB; SS = SPLIT SPOON; ST = SHELBY TUBE

APPENDIX IV
DETAILED LABORATORY RESULTS

RECEIVED

JUN 22 2006

ANALYTICAL REPORT

PINCHIN ENVIRONMENTAL

ATTN: JOANNE LANOIE

172 MARION ST

WINNIPEG MB R2H 0T4

Reported On: 16-JUN-06 03:20 PM

Lab Work Order #: **L397966**

Date Received: **08-JUN-06**

Project P.O. #:

Job Reference: 35204

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:

APPROVED BY: Paul Nicolas

PAUL NICOLAS

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

Manitoba Technology Centre Ltd.

Part of the **ALS Laboratory Group**

1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4

Phone: +1 204 225 9720 Fax: +1 204 225 9721 www.alsglobal.com

A Campbell Brothers Limited Company

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L	Units	Extracted	Analyzed	By	Batch
L397966-1 BH1-2.2								
Sample Date: 07-JUN-06								
Matrix: SOIL								
CCME BTEX, TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5	IPT	5	mg/kg		15-JUN-06		
F1-BTEX	<5		5	mg/kg		15-JUN-06		
F2 (C10-C16)	<5		5	mg/kg		15-JUN-06		
F3 (C16-C34)	9		5	mg/kg		15-JUN-06		
F4 (C34-C50)	7		5	mg/kg		15-JUN-06		
Total Hydrocarbons (C6-C50)	16		5	mg/kg		15-JUN-06		
Chromatogram to baseline at nC50	YES							
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					14-JUN-06	15-JUN-06	GVZ/	R409366
CCME BTEX								
Benzene	<0.005		0.005	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
Toluene	<0.01		0.01	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
Ethylbenzene	<0.01		0.01	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
Xylenes	<0.01		0.01	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
% Moisture	29		0.1	%	14-JUN-06	15-JUN-06	AKK	R409489
L397966-2 BH3 - 1.2								
Sample Date: 07-JUN-06								
Matrix: SOIL								
CCME BTEX, TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5	IPT	5	mg/kg		15-JUN-06		
F1-BTEX	<5		5	mg/kg		15-JUN-06		
F2 (C10-C16)	<5		5	mg/kg		15-JUN-06		
F3 (C16-C34)	9		5	mg/kg		15-JUN-06		
F4 (C34-C50)	10		5	mg/kg		15-JUN-06		
Total Hydrocarbons (C6-C50)	19		5	mg/kg		15-JUN-06		
Chromatogram to baseline at nC50	YES							
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					14-JUN-06	15-JUN-06	GVZ/	R409366
CCME BTEX								
Benzene	<0.005		0.005	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
Toluene	<0.01		0.01	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
Ethylbenzene	<0.01		0.01	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
Xylenes	<0.01		0.01	mg/kg	14-JUN-06	15-JUN-06	KEB	R409921
% Moisture	27		0.1	%	14-JUN-06	15-JUN-06	AKK	R409489
L397966-3 BH4 - 0.75								
Sample Date: 07-JUN-06								
Matrix: SOIL								
CCME BTEX, TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5	IPT	5	mg/kg		15-JUN-06		
F1-BTEX	<5		5	mg/kg		15-JUN-06		
F2 (C10-C16)	4000		5	mg/kg		15-JUN-06		
F3 (C16-C34)	1800		5	mg/kg		15-JUN-06		
F4 (C34-C50)	92		5	mg/kg		15-JUN-06		
Total Hydrocarbons (C6-C50)	5900		5	mg/kg		15-JUN-06		
Chromatogram to baseline at nC50	YES					15-JUN-06		

ENVIRO-TEST ANALYTICAL REPORT[illegible]

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
IPT	Instrument performance showing response factors for C6 and C10 not within 30% of the response factor for toluene.

Methods Listed (If applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
ETL-BTX,TVH-CCME-CL	Soil	CCME BTEX	CCME CWS-PHC DEC2000	CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TEH-CCME-CL	Soil	CCME Total Extractable Hydrocarbons	CCME CWS-PHC DEC2000	CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TVH,TEH-CCME-CL	Soil	CCME Total Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

PREP-MOISTURE-CL	Soil	% Moisture	Oven dry 105C-Gravimetric
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** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA		

Reference Information

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

~~*Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.*~~

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.



Environmental Division

ALS Laboratory Group Quality Control Report

Workorder: L397966

Report Date: 16-JUN-06

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Client: PINCHIN ENVIRONMENTAL
172 MARION ST
WINNIPEG MB R2H 0T4

Contact: JOANNE LANOIE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ETL-BTX,TVH-CCME-CL Soil								
Batch	R409921							
WG454742-2	DUP	L397966-1						
Benzene		<0.005	<0.005	RPD-NA	mg/kg	N/A	46	15-JUN-06
Ethylbenzene		<0.01	<0.01	RPD-NA	mg/kg	N/A	46	15-JUN-06
Toluene		<0.01	<0.01	RPD-NA	mg/kg	N/A	46	15-JUN-06
TVH: (C6-C10 / No BTEX Correction)		<5	<5	RPD-NA	mg/kg	N/A	46	15-JUN-06
Xylenes		<0.01	<0.01	RPD-NA	mg/kg	N/A	46	15-JUN-06
WG454742-1	MB							
Benzene			<0.005		mg/kg		0.005	15-JUN-06
Ethylbenzene			<0.01		mg/kg		0.01	15-JUN-06
Toluene			<0.01		mg/kg		0.01	15-JUN-06
TVH: (C6-C10 / No BTEX Correction)			<5		mg/kg		5	15-JUN-06
Xylenes			<0.01		mg/kg		0.01	15-JUN-06
WG454742-3	MS	L397966-2						
Benzene			95		%		45-137	15-JUN-06
Ethylbenzene			105		%		49-142	15-JUN-06
Toluene			97		%		59-144	15-JUN-06
TVH: (C6-C10 / No BTEX Correction)			92		%		46-145	15-JUN-06
Xylenes			102		%		48-143	15-JUN-06
ETL-TEH-CCME-CL Soil								
Batch	R409366							
WG455090-4	DUP	L399083-1						
TEH: (C10-C16)		34	36	J	mg/kg	2	20	14-JUN-06
TEH: (C16-C34)		<5	13		mg/kg	N/A	46	14-JUN-06
TEH: (C34-C50)		<5	5	RPD-NA	mg/kg	N/A	46	14-JUN-06
WG455090-8	DUP	L398653-4						
TEH: (C10-C16)		480	410		mg/kg	14	46	15-JUN-06
TEH: (C16-C34)		1900	1400		mg/kg	25	46	15-JUN-06
TEH: (C34-C50)		540	420		mg/kg	23	46	15-JUN-06
WG455090-9	DUP	L397966-1						
TEH: (C10-C16)		<5	<5	RPD-NA	mg/kg	N/A	46	15-JUN-06
TEH: (C16-C34)		9	16	J	mg/kg	6	20	15-JUN-06
TEH: (C34-C50)		7	10	J	mg/kg	3	20	15-JUN-06
WG455090-10	MS	L397966-2						
TEH: (C10-C16)			100		%		42-126	15-JUN-06
TEH: (C16-C34)			100		%		42-126	15-JUN-06

ALS Laboratory Group Quality Control Report

Workorder: L397966

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>ETL-TEH-CCME-CL</u>		<u>Soil</u>						
Batch	R409366							
WG455090-10 MS		L397966-2						
TEH: (C34-C50)			100		%		42-126	15-JUN-06
WG455090-5 MS		L399083-2						
TEH: (C10-C16)			101		%		42-126	14-JUN-06
TEH: (C16-C34)			101		%		42-126	14-JUN-06
TEH: (C34-C50)			101		%		42-126	14-JUN-06
<u>PREP-MOISTURE-CL</u>		<u>Soil</u>						
Batch	R409489							
WG455220-1 DUP		L397798-1						
% Moisture		5.5	5.8		%	5.3	15	15-JUN-06
WG455220-2 DUP		L397961-8						
% Moisture		9.5	9.7		%	2.3	15	15-JUN-06
WG455220-3 DUP		L397966-1						
% Moisture		29	29		%	1.5	15	15-JUN-06
WG455220-4 DUP		L398857-1						
% Moisture		15	16		%	4.4	15	15-JUN-06

ALS Laboratory Group Quality Control Report

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Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated chloride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
J	Duplicate results and limit(s) are expressed in terms of absolute difference.
K	The sample referenced above is of a non-standard matrix type; standard QC acceptance criteria may not be achievable.