This report done through Provincial "Tank Remediation Program"

Just but the report has been filed under the land title - property

PHASE II ENVIRONMENTAL SITE ASSESSMENT
PTMAA SITE 00123-3662: FORMER GARAGE FACILITY
NORTH OF CLANDONALD, ALBERTA
(SE 1/4 SEC. 31-53-5-W4M)

Municipality owned from Nov 9/2000 to April 11/2004

Report

to

County of Vermillion River No. 24
&
A D Williams Engineering Inc.

PROFESSIONAL ENGINEER ALBERTA DOUGLAS SMITH

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D. Smith, M. Eng., P. Eng.
Senior Environmental Engineer

PERMIT TO PRACTICE
THURBER ENVIRONMENTAL CONSULTANTS LTD.
Signature _____
Date May 13/2002
PERMIT NUMBER: P 5187
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

PROFESSIONAL ENGINEER ALBERTA NEAL H. FERNUIK

N.H. Fernuik, P. Biol., P. Eng.
Review Principal

Date: May 10, 2002
File: 19-3752-0

EXECUTIVE SUMMARY

This report documents a Phase II Environmental Site Assessment that Thurber Environmental Consultants Ltd. ("Thurber") completed for The County of Vermillion River No. 24 further to a grant provided by Alberta Municipal Affairs ("AMA"). AMA is responsible to implement the Alberta government's Underground Petroleum Storage Tank Site Remediation Program.

The site that Thurber assessed is known as the former Clandonald Garage, just north of Clandonald, Alberta. It can be described as a portion of SE ¼ Sec. 31-53-5-W4M.

The objective was to confirm the presence/ absence of petroleum contaminated soils and groundwater beneath the site, based on the proposed number of samples and the laboratory analyses that were completed. The summarized scope of work included the following activities:

- completing a site reconnaissance;
- undertaking a field program consisting of locating underground utilities, drilling boreholes, installing monitoring wells, and obtaining soil and groundwater samples ;
- completing a laboratory testing program in which three (3) soil samples and one (1) groundwater sample was analyzed for selected analytes, as well as conducting a grain size analysis on one (1) soil sample ;
- evaluating petroleum compounds in context of Alberta Environment's ("AENV's") Risk Management Guidelines for Petroleum Storage Tank (PST) Sites (2001) guideline and assessing the degree/ extent of petroleum contaminated soils/ groundwater;
- documenting the activities and the findings of the above herein.

Soil and groundwater at the borehole and monitoring well locations meet the applied AENV PST "Soil and Groundwater Risk Management Criteria for Groundwater Ingestion Pathway" (fine-grained soil).

Use of this report is subject to the Statement of General Conditions that is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they are followed for the proper use and interpretation of this report. This report has been prepared for the use of the landowner and A D Williams Engineering Inc.

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1. INTRODUCTION

1.1 General

This report documents a Phase II Environmental Site Assessment that Thurber Environmental Consultants Ltd. ("Thurber") completed for The County of Vermillion River No. 24 through a government grant administered by Alberta Municipal Affairs ("AMA"). AMA is responsible to implement the Alberta government's Underground Petroleum Storage Tank Site Remediation Program.

The site that Thurber assessed is known as the former Clandonald Garage, just north of Clandonald, Alberta, and can be described as a portion of SE ¼ Sec. 31-53-5-W4M. Photographs of the site are included in Appendix A. The location of site is marked on Drawings 19-3752-0-1 and 19-3752-0-2 of Appendix B.

1.2 Objective/ Scope of Work

The objective was to confirm the presence/ absence of petroleum contaminated soils and groundwater beneath the site, based on the proposed number of samples and the laboratory analyses that were completed.

The summarized scope of work included the following activities:

- completing a site reconnaissance;
- undertaking a field program consisting of locating underground utilities, drilling boreholes, installing monitoring wells, and obtaining soil and groundwater samples;
- completing a laboratory testing program in which three (3) soil samples and one (1) groundwater sample was analyzed for selected analytes, as well as conducting a grain size analysis on one (1) soil sample;

- evaluating petroleum compounds in context of Alberta Environment's ("AENV's") Risk Management Guidelines for Petroleum Storage Tank (PST) Sites (2001) guideline and assessing the degree/ extent of petroleum contaminated soils/ groundwater;

- documenting the activities and the findings of the above herein.

1.3 Limitations

Use of this report is subject to the Statement of General Conditions that is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they are followed for the proper use and interpretation of this report.

2. BACKGROUND

2.1 Site Occupants

The site that Thurber investigated had been formerly occupied by the Clandonald Garage. This site had been previously used to retail gasoline.

2.2 Petroleum Releases

The Let'r Buck Consulting Ltd.[1] report for the site indicated that there were no hydrocarbon contaminants at this location. Thurber was not provided with any additional information (from the PTMAA or others) that pertained to the integrity of the former fuel system or the environmental condition of the land.

3. DESCRIPTION

3.1 Site

The site was relatively flat with a gentle slope to the north. For the most part, the site was tree covered. Although standing water or surface water run-off were not observed on the date of Thurber's investigation, surface water run-off likely would flow northward. The buildings on the site comprised of a house, an office shed,

[1] Let'r Buck Consulting Ltd., May 2000, "Audit Report to the County of Vermillion River".

and two other sheds. Photographs of the site are included in Appendix A. The approximate locations of these features are marked on Drawing 19-3752-0-2 of Appendix B.

3.2 Infrastructure

Thurber did not have access to any PTMAA "Tank Management System" database report for site 00123-3662.

Thurber did not observe any pumps or dispensers on the property. According to Let'r Buck Consulting Ltd.[1] (2000), there are presently no underground storage tanks (USTs) at the site. Aside from the underground Telus facilities in the driveway to the existing home on site and gas lines on the west side of the lot, underground infrastructure related to the former fuel dispensing system are unknown.

3.3 Adjoining Lands

Adjoining land north of the site is rural residential, tree covered; land east is public roadway (Rural Route 55) and to the east of RR 55 is Raft Lake; south is rural residential, tree covered and land west is rural residential, tree covered.

4. FIELD INVESTIGATIONS

4.1 Soil Sampling Protocol

The boreholes were targeted in reference to the Let'r Buck Consulting Ltd. (2000) report and discussions with the County of Vermillion River No. 24. McAllister Holdings Ltd. used an auger rig and solid-stem augers to advance the boreholes on April 9, 2002 under the supervision of Thurber's field technician. The seven (7) 15-cm diameter boreholes (CD02-01 through CD02-07) were advanced to depths that ranged between 8.0 and 8.4 m. The approximate locations of Thurber's boreholes are plotted on Drawing 19-3752-0-2 of Appendix B.

Generally, soils were sampled at 0.5 m increments from the ground's surface to the total borehole depth. Thurber classified and sampled the soils at recovery. Each of the 0.1 m intervals of soil that was sampled was split into two sub-samples using a stainless steel putty knife; one portion was preserved for organic vapour

analysis in the field, the other portion was preserved for potential chemical analyses. Borehole logs are presented in Appendix C.

4.2 Soil Observations

The soil samples were visually inspected at recovery for indications of petroleum contamination. No odours of gasoline/ diesel fuel or staining were observed on samples from each borehole.

Thurber used an RKI Eagle combustible gas meter in the field to measure the concentration of organic vapours in the soil gas over the samples (i.e., the sample "headspace"). The headspace concentrations ranged between 0 to 55 ppmv (parts per million by volume) in several samples recovered from each of boreholes CD02-01 through CD02-07.

Field observations of petroleum stains, odours and the field measured headspace concentrations are reported on the borehole logs in Appendix C.

4.3 Geology

Approximately 2 to 4 m of sand/clay fill overlaid clay till that extended beyond the maximum 8.4 m depth of investigation in borehole CD02-05. Bedrock was not intersected in any of the boreholes. Borehole logs are included in Appendix C.

4.4 Groundwater Sampling Protocol

Groundwater monitoring wells were installed in boreholes CD02-02, CD02-05 and CD02-07. The wells were completed with 50 mm diameter schedule 40 PVC risers threaded to 0.020" machine-slotted screens. Screens were packed with clean silica frac sand and bentonite chips were placed on the pack to seal the annulus to grade. All wells were secured with steel stick up protectors. Completion details for the monitoring wells are included in Table 4.1 and in the borehole logs of Appendix C.

4.5 Groundwater Observations

Thurber tested the headspace over the water in the monitoring wells with an RKI Eagle and dipped the wells with an oil-water interface probe on April 19, 2002. The concentration of organic vapours ranged between 0 and 5 ppmv (parts per

Table 4.1:

Observation Well Completion and Monitoring Data

Phase II ESA

PTMAA Site 00123-3662; County of Vermillion River No. 24

Clandonald, Alberta

Parameter	Units	CD02-02	CD02-05	CD02-07
Completed	date	19-Apr-02	19-Apr-02	19-Apr-02
Ground Elevation	m	99.67	100.58	100.74
Top of riser	m	100.42	101.24	100.74
Top of screen	m	99.17	99.78	100.04
Intersects	unitless	clay till	clay till	clay till
Bottom of screen	m	91.67	92.58	92.74
Total depth	m	91.27	92.18	92.44
Monitored	date	09-Feb-01	09-Feb-01	21-Feb-01
LNAPL depth	mBGL	ND	ND	ND
Uncorrected water level	mBGL	6.22	DRY	DRY
Uncorrected water elevation	m	93.45	NA	NA
Apparent thickness LNAPL	m	ND	ND	ND
True thickness LNAPL	m	NA	NA	NA
Corrected water level	mBGL	6.22	DRY	DRY
Corrected water elevation	m	93.45	N/A	N/A
Organic vapour concentration	ppmv	5	NA	NA

Elevations referenced from assumed datum benchmark: 100.00 m
Benchmark as marked on Drawing 19-3752-0-3
ND - not detected
NA - not applicable
DRY - water not detected when dipped
UNKNOWN - dry well, can't calculate water table elevation
True thickness LNAPL overstated (actually thickness of mobile oil, immobile oil and water capillary)

DS 10/05/02

million by volume), in monitoring wells CD02-02, CD02-05 and CD02-07, respectively. Monitoring wells CD02-02, CD02-05 and CD02-07 were dry when installed on April 9, 2002 and monitoring wells CD02-05 and CD02-07 were dry during the monitoring event of April 19, 2002. Free-phase petroleum was not detected in any of the wells.

4.6 Hydrogeology

The ground elevations at the monitoring wells were surveyed on April 19, 2002 using an assumed elevation datum of 100.000 m. On April 19, 2002, the groundwater in monitoring well CD02-02 was 6.22 metres below ground level (mBGL). The results are summarized in Table 4.1. Based on this water level and the local topography, shallow groundwater beneath the site is inferred to have potential to flow northeasterly, as plotted on Drawing 19-3752-0-2 of Appendix B.

4.7 Quality Control and Environmental Practice

Clean lead auger flights were used at each borehole. All sampling tools were decontaminated between successive samples by using a tri-sodium phosphate solution cleanser and a tap water rinse. The oil-water interface probe was similarly decontaminated between successive monitoring wells. The groundwater was sampled by using a dedicated bailer to reduce the chance of contaminants being transferred from other wells.

5. LABORATORY INVESTIGATIONS

5.1 Soil Samples and Analytes

Maxxam Analytics Inc. analyzed soil samples from boreholes CD02-01, CD02-03, and CD02-04. Selection of these soil samples was based on field headspace measurements of organic vapours.

The soil samples were analyzed for petroleum hydrocarbon fractions F_1 through F_4, benzene, toluene, ethylbenzene, and xylene (BTEX), as well as lead. The three samples were also analyzed for grain size distribution. These analytes were appropriate given the potential for refined petroleum contaminants and the criteria cited by Alberta Environment (AENV) in its 2001 Petroleum Storage Tank (PST) guidelines. The laboratory's analytical report and QA/ QC summaries are included in Appendix D.

5.2 Criteria

As there is an existing drinking water well on the property, the guideline that was applied to assess the petroleum concentrations in soil and groundwater was AENV's 2001 PST "Soil and Groundwater Risk Management Criteria for Groundwater Ingestion Pathway (fine-grained).

5.3 Findings - Soil

The analytical results from the laboratory's report are presented in Table 5.1 with the applied AENV 2001 PST criteria. As shown, the measured concentrations of all constituents from each sample do not exceed (i.e. soil quality meets) the applied AENV 2001 PST criteria. The laboratory's analytical report is included in Appendix D.

5.4 Groundwater Samples and Analytes

Maxxam Analytics Inc. analyzed one groundwater sample from monitoring well CD02-02, as the other two monitoring wells were dry at the time of sampling.

The groundwater sample was analyzed for petroleum hydrocarbon fractions F_1 and F_2, as well as BTEX. Laboratory documents are included in Appendix D.

5.5 Findings - Groundwater

The analytical results from the laboratory's report are presented in Table 5.2 with the applied criteria. As shown, the measured concentrations of all constituents did not exceed (i.e. groundwater quality meets) the applied AENV 2001 PST criteria. The laboratory's analytical report is presented in Appendix D.

5.6 Quality Assurance

The laboratory's quality assurance report indicated that its extraction method was efficient (i.e., surrogate recovered from purge), its analytical equipment was performing within the accepted tolerance (i.e., calibration checks), and that the analytical equipment did not bias the analyses (i.e., laboratory blanks).

Table 5.1:

Soil Chemical Data: Sampled April 9, 2002

Phase II ESA

PTMAA Site 00123-3662; County of Vermillion River No. 24
Clandonald, Alberta

Analyte	**MDL**	**PST Criteria**	**CD02-01**	**CD02-03**	**CD02-04**
depth			3.9 to 4.1m	3.9 to 4.1 m	1.3 to 1.5 m
soil type			sand/clay (till)	clay (till)	clay (fill)
all values reported in mg/ kg (ppm)					
F_1	20	1900	<20	<20	<20
F_2	10	2600	<10	<10	<10
F_3	10	NA	<10	<10	<10
F_4	10	NA	<10	<10	<10
F4G	1000	NS	<1000	<1000	<1000
benzene	0.04	0.073	<0.04	<0.04	<0.04
toluene	0.04	0.86	<0.04	<0.04	<0.04
ethylbenzene	0.04	0.19	<0.04	<0.04	<0.04
total xylene	0.08	25	<0.08	<0.08	<0.08
lead	0.3	NS	5.7	4.9	2.6

NA - not applicable
NS - not specified

PST - Alberta Environment *Risk Management Guidelines for Petroleum Storage Tank Sites, October 2001*
"Soil and Groundwater Risk Management Criteria for Groundwater Ingestion Pathway": fine-grained soil
contaminant concentration exceeds the applied PST criteria

Table 5.2:

Groundwater Chemical Data: Sampled April 19, 2002

Phase II ESA

PTMAA Site 00123-3662; County of Vermillion River No. 24
Clandonald, Alberta

Analyte	MDL	PST Criteria	CD02-02	CD02-05*	CD02-07*
all values reported in mg/ L (ppm)					
F_1	0.1	5	<0.1		
F_2	0.1	2	<0.1		
F_3		NA			
F_4		NA			
benzene	0.0004	0.005	<0.0004		
toluene	0.0004	0.024	<0.0004		
ethylbenzene	0.0004	0.0024	<0.0004		
total xylenes	0.0008	0.3	<0.0008		

NA - not applicable
NS - not specified
* Monitoring Wells reported dry on April 19, 2002.
PST - Alberta Environment *Risk Management Guidelines for Petroleum Storage Tank Sites, October 2001*
"Soil and Groundwater Risk Management Criteria for Groundwater Ingestion Pathway": fine-grained soil contaminant concentration exceeds the applied PST criteria

6. SITE ASSESSMENT

The BTEX, F_1, F_2, F_3, and F_4 petroleum hydrocarbon fractions in all of the soil samples were less than (i.e. soil quality met) the respective 2001 AENV PST "Soil and Groundwater Risk Management Criteria for Groundwater Ingestion Pathway" (fine grained soil) guidelines. Although there is no criteria for lead, it meets the criteria for fine grained soils for residential use (140mg/kg).

Free phase petroleum hydrocarbons were not detected on the groundwater beneath the site. Dissolved phase petroleum contaminants were not detected in the groundwater. BTEX, F_1, and F_2 petroleum hydrocarbon fractions were less than (i.e., groundwater quality met) 2001 AENV PST guidelines.

7. CONCLUSIONS

The concentrations of petroleum hydrocarbon fractions F_1 through F_4, BTEX in soils and groundwater beneath the site at the three borehole and monitoring well locations meet the applied risk management criteria that are set out in AENV's 2001 PST guidelines.

STATEMENT OF GENERAL CONDITIONS

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering or environmental consulting practices in this area. No other warranty, expressed or implied, is made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorize only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorized use of the Report.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgemental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

(see over...)

APPENDIX A

Photographs

PHOTO 1 : LOOKING WESTWARD

PHOTO 2 : LOOKING NORTHEAST

THURBER PROJECT #19-3752-0

ENGINEER DS	ALBERTA MUNICIPAL AFFAIRS	THURBER
DRAWN MNG	SITE PHOTOGRAPHS	
DATE MAY 2002		
APPROVED		
SCALE	PHASE III ESA — CLANDONALD, AB	DRAWING No. PLATES 1&2

PHOTO 3 : LOOKING SOUTHWARD

PHOTO 4 : LOOKING NORTHWARD

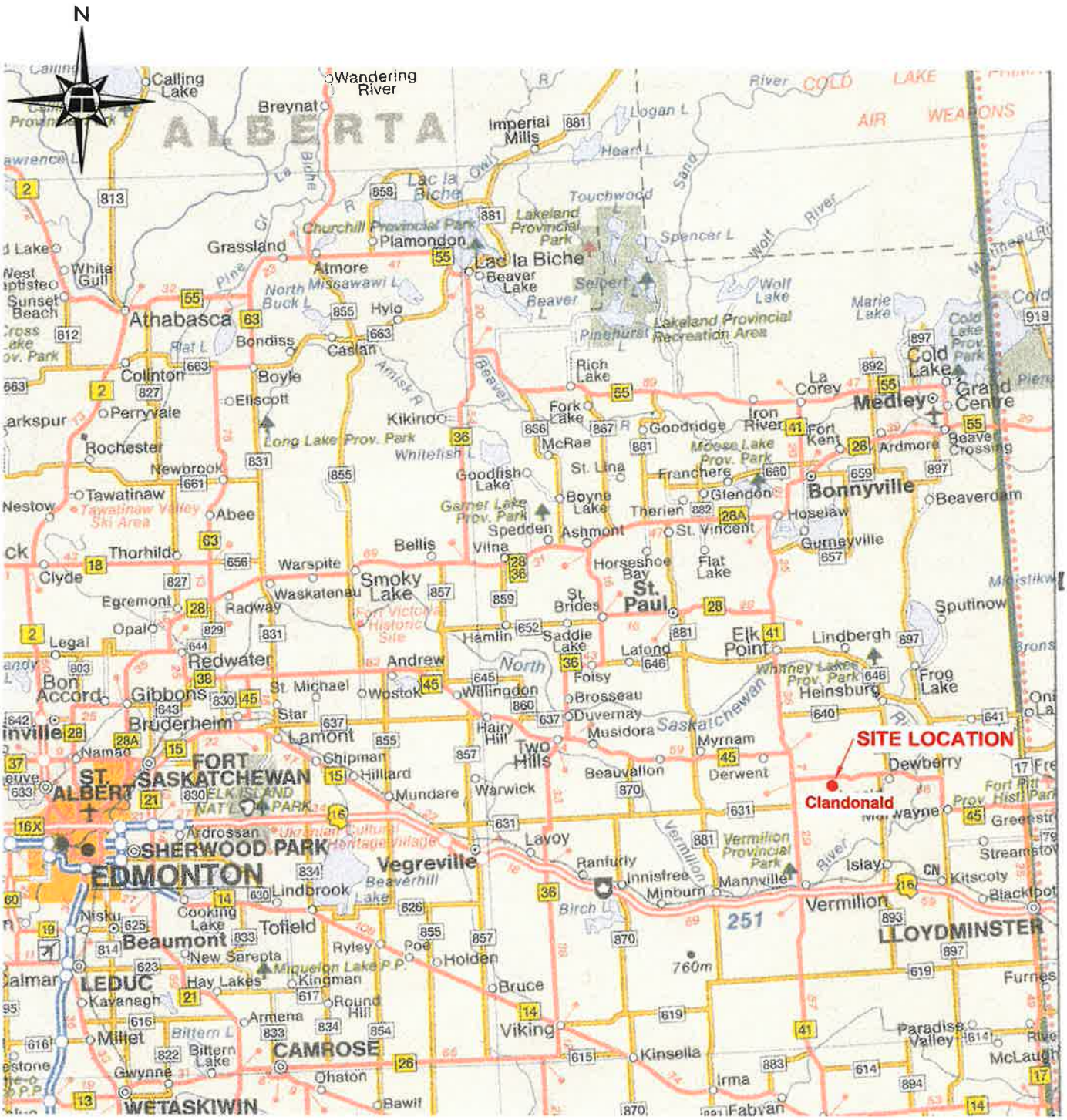
THURBER PROJECT #19-3752-0

ENGINEER DS	ALBERTA MUNICIPAL AFFAIRS	THURBER
DRAWN MNG	SITE PHOTOGRAPHS	
DATE MAY 2002		
APPROVED		
SCALE	PHASE III ESA — CLANDONALD, AB	DRAWING No. PLATES 3&4

APPENDIX B

Drawings

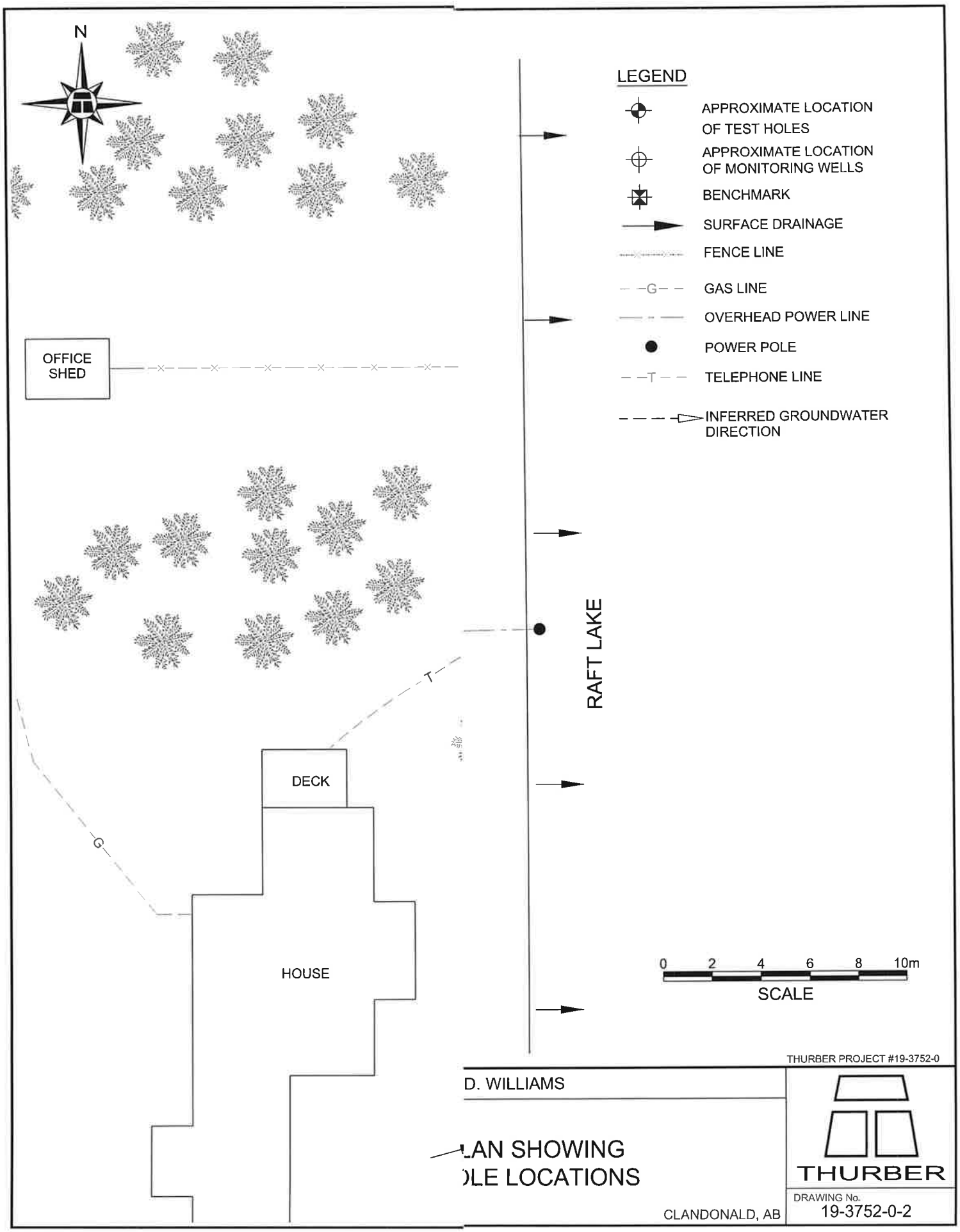
THURBER



BASE MAP PROVIDED BY MAPART

THURBER PROJECT #19-3752-0

ENGINEER	DS	A. D. WILLIAMS	THURBER
DRAWN	ZD	REGIONAL MAP	
DATE	APRIL 2002		
APPROVED			DRAWING No. 19-3752-0-1
SCALE	N. T. S.	PHASE II ESA	CLANDONALD, AB


N
LEGEND
APPROXIMATE LOCATION OF TEST HOLES
APPROXIMATE LOCATION OF MONITORING WELLS
BENCHMARK
SURFACE DRAINAGE
FENCE LINE
GAS LINE
OVERHEAD POWER LINE
POWER POLE
TELEPHONE LINE
INFERRED GROUNDWATER DIRECTION
OFFICE SHED
RAFT LAKE
DECK
HOUSE
G
T
0 2 4 6 8 10m
SCALE
THURBER PROJECT #19-3752-0
D. WILLIAMS
LAN SHOWING
OLE LOCATIONS
CLANDONALD, AB
THURBER
DRAWING No.
19-3752-0-2

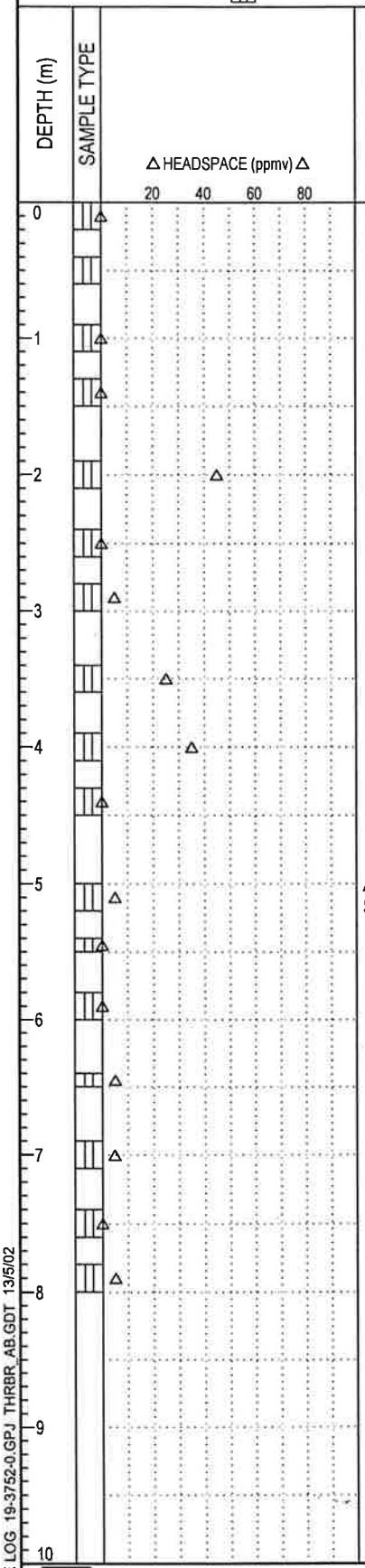
APPENDIX C

Borehole Logs

THURBER

CLIENT: A D Williams	PROJECT: Phase II ESA - Clandonald	BOREHOLE NO: **CD02-01**
DRILLING COMPANY: McAllister Holdings Ltd.	DATE DRILLED: April 9, 2002	PROJECT NO: 19-3752-0
DRILL/METHOD: Solid Stem Auger	LOCATION: See Dwg. 19-3752-0-2	ELEVATION:

SAMPLE TYPE ▥ GRAB SAMPLE



REMARKS	SOIL DESCRIPTION	DEPTH (m)
	SAND brown, silty, fine grained	0
	-becomes more coarse,trace clay	1
	-becomes clayey	2
	CLAY (TILL) brown, some sand lenses, trace black seams, trace gravel, trace oxides	3
April 9, 2002 Seepage at 5.0 mbgl	-becomes grey	4
	END OF TEST HOLE AT 8.0 m UPON COMPLETION: -No slough BACKFILLED WITH DRILL CUTTINGS	5
		6
		7
		8
		9
		10

BOREHOLE LOG 19-3752-0.GPJ THRBR_AB.GDT 13/5/02

THURBER

Thurber Environmental Consultants Ltd.
Edmonton, Alberta

LOGGED BY: KD	COMPLETION DEPTH: 8.0 m
REVIEWED BY: MFH	COMPLETION DATE: 9/4/02
	Page 1 of 1

CLIENT: A D Williams	PROJECT: Phase II ESA - Clandonald	BOREHOLE NO: **CD02-02**
DRILLING COMPANY: McAllister Holdings Ltd.	DATE DRILLED: April 9, 2002	PROJECT NO: 19-3752-0
DRILL/METHOD: Solid Stem Auger	LOCATION: See Dwg. 19-3752-0-2	ELEVATION: 99.666 (m)

SAMPLE TYPE: GRAB SAMPLE

BACKFILL TYPE: SAND, BENTONITE

DEPTH (m)	SAMPLE TYPE	△ HEADSPACE (ppmv) △ 20 40 60 80	REMARKS	SOIL DESCRIPTION	ELEVATION (m)
0				SAND AND CLAY (FILL) fine to coarse sand, clay pockets, trace gravel	99
1					
2				-some gravel	98
3				CLAY (TILL) brown, some sand, trace oxides	97
4					96
5				-some gravel -trace sand lense	95
6				-becomes grey	94
7					93
8					92
9				END OF TEST HOLE AT 8.0 m UPON COMPLETION: -No slough MONITORING WELL INSTALLED GRONDWATER DEPTH BELOW GROUND SURFACE: April 19, 2002 - 6.22m	91
10					90

BOREHOLE LOG 19-3752-0.GPJ THRBR_AB.GDT 13/5/02

THURBER

Thurber Environmental Consultants Ltd.
Edmonton, Alberta

LOGGED BY: KD	COMPLETION DEPTH: 8.0 m
REVIEWED BY: MFH	COMPLETION DATE: 9/4/02
	Page 1 of 1

CLIENT: A D Williams	PROJECT: Phase II ESA - Clandonald	BOREHOLE NO: **CD02-03**
DRILLING COMPANY: McAllister Holdings Ltd.	DATE DRILLED: April 9, 2002	PROJECT NO: 19-3752-0
DRILL/METHOD: Solid Stem Auger	LOCATION: See Dwg. 19-3752-0-2	ELEVATION:

SAMPLE TYPE ▥ GRAB SAMPLE

DEPTH (m)	SAMPLE TYPE	△ HEADSPACE (ppmv) △ 20 40 60 80	REMARKS	SOIL DESCRIPTION	DEPTH (m)
0	▥	△		SAND (FILL) fine grained, silty, some clay	0
1	▥	△			1
	▥	△			
2	▥	△		-becomes clayey	2
	▥	△			
3	▥	△		CLAY (TILL) brown, very sandy, trace gravel, trace coal, trace oxides	3
	▥	△			
4	▥	△			4
	▥				
5	▥	△	April 9, 2002 Seepage at 5.5 mbgl	-trace coarse sand lense	5
	▥	△		-becomes grey-brown mottled	
6	▥	△			6
	▥			-becomes grey	
7	▥	△			7
	▥	△			
8	▥	△		END OF TEST HOLE AT 8.0 m UPON COMPLETION: -No slough BACKFILLED WITH DRILL CUTTINGS	8
9					9
10					10

BOREHOLE LOG 19-3752-0.GPJ THRBR_AB.GDT 13/5/02

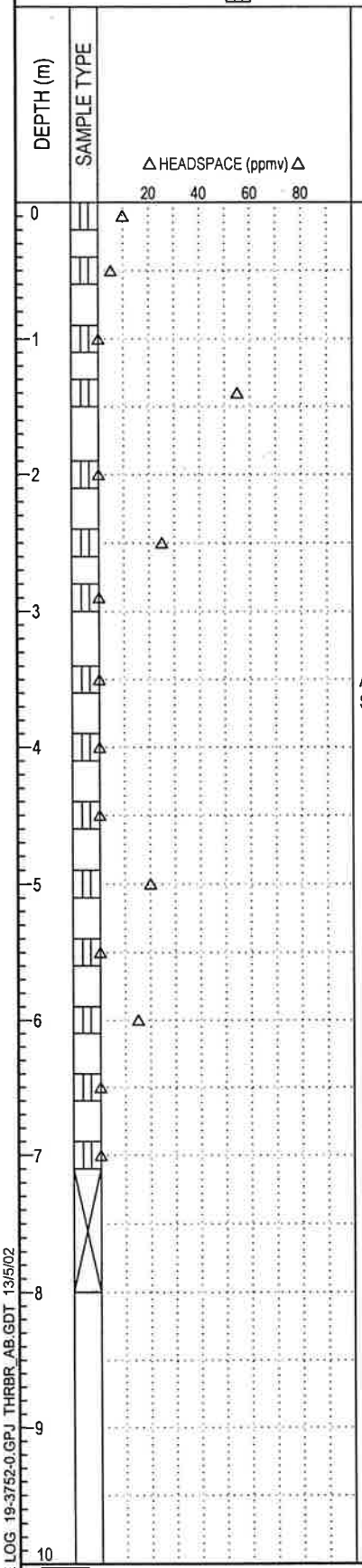
THURBER

Thurber Environmental Consultants Ltd.
Edmonton, Alberta

LOGGED BY: KD	COMPLETION DEPTH: 8.0 m
REVIEWED BY: MFH	COMPLETION DATE: 9/4/02
	Page 1 of 1

CLIENT: A D Williams	PROJECT: Phase II ESA - Clandonald	BOREHOLE NO: **CD02-04**
DRILLING COMPANY: McAllister Holdings Ltd.	DATE DRILLED: April 9, 2002	PROJECT NO: 19-3752-0
DRILL/METHOD: Solid Stem Auger	LOCATION: See Dwg. 19-3752-0-2	ELEVATION:

SAMPLE TYPE ▥ GRAB SAMPLE ☒ NO RECOVERY



REMARKS	SOIL DESCRIPTION	DEPTH (m)
	CLAY (FILL) brown, very sandy, silty	0
	CLAY (TILL) sandy, trace gravel, trace oxides	2
April 9, 2002 Seepage at 3.5 mbgl	-trace coarse sand lense	3
	-no sand lense	4
	-trace silt pockets	5
	-some oxides	6
Sample lost from auger 7.1 m - 8.0 m		7
	END OF TEST HOLE AT 8.0 m UPON COMPLETION: -No slough BACKFILLED WITH DRILL CUTTINGS	8
		9
		10

BOREHOLE LOG 19-3752-0.GPJ THRBR_AB.GDT 13/5/02

THURBER

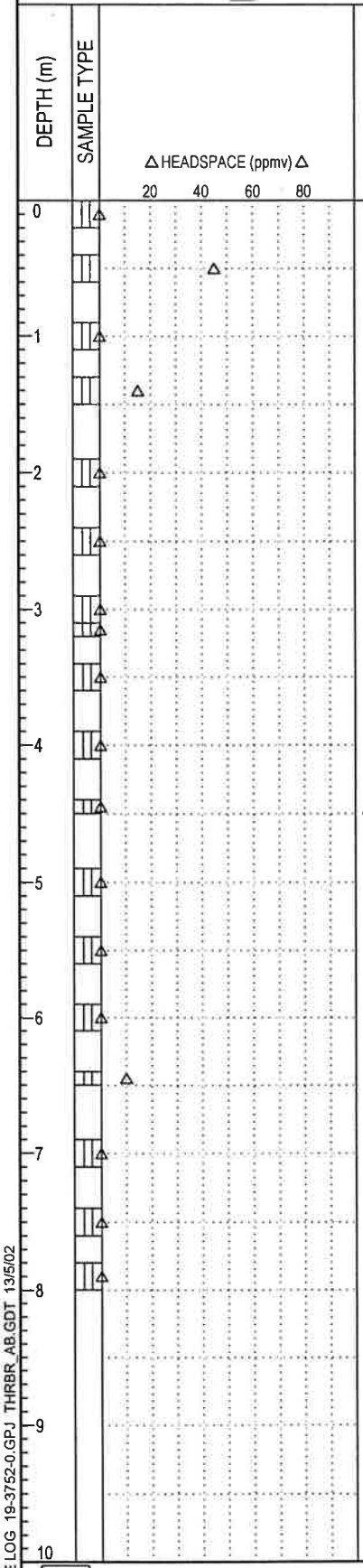
Thurber Environmental Consultants Ltd.
Edmonton, Alberta

LOGGED BY: KD	COMPLETION DEPTH: 8.0 m
REVIEWED BY: MFH	COMPLETION DATE: 9/4/02
	Page 1 of 1

CLIENT: A D Williams	PROJECT: Phase II ESA - Clandonald	BOREHOLE NO: **CD02-05**
DRILLING COMPANY: McAllister Holdings Ltd.	DATE DRILLED: April 9, 2002	PROJECT NO: 19-3752-0
DRILL/METHOD: Solid Stem Auger	LOCATION: See Dwg. 19-3752-0-2	ELEVATION: 100.578 (m)

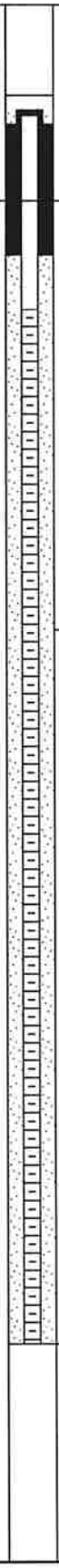
SAMPLE TYPE: GRAB SAMPLE

BACKFILL TYPE: SAND; BENTONITE



REMARKS

April 9, 2002
Seepage at 4.45 mbgl



SOIL DESCRIPTION

SAND (FILL)
brown, medium grained, trace clay

-becomes medium to coarse grained, trace silt

CLAY (TILL)
brown, trace sand lense

-some gravel

-becomes grey

END OF TEST HOLE AT 8.4 m
UPON COMPLETION:
-No slough
-Groundwater between 4.5 m and 5.0 m
MONITORING WELL INSTALLED
April 19, 2002 - Dry

ELEVATION (m): 100, 99, 98, 97, 96, 95, 94, 93, 92, 91

BOREHOLE LOG 19-3752-0.GPJ THRBR_AB.GDT 13/5/02

THURBER

Thurber Environmental Consultants Ltd.
Edmonton, Alberta

LOGGED BY: KD	COMPLETION DEPTH: 8.4 m
REVIEWED BY: MFH	COMPLETION DATE: 9/4/02

CLIENT: A D Williams	PROJECT: Phase II ESA - Clandonald	BOREHOLE NO: **CD02-06**
DRILLING COMPANY: McAllister Holdings Ltd.	DATE DRILLED: April 9, 2002	PROJECT NO: 19-3752-0
DRILL/METHOD: Solid Stem Auger	LOCATION: See Dwg. 19-3752-0-2	ELEVATION:

SAMPLE TYPE ▥ GRAB SAMPLE

DEPTH (m)	SAMPLE TYPE	△ HEADSPACE (ppmv) △ 20 40 60 80	REMARKS	SOIL DESCRIPTION	DEPTH (m)
0	▥	△		SAND (FILL) brown, silty	0
1	▥	△ △			1
2	▥	△			2
3	▥	△ △		CLAY (TILL) sandy, silty, trace gravel, trace oxides -0.3 m sand lense	3
4	▥	△			4
5	▥	△			5
6	▥	△		-trace sand	6
7	▥	△ △			7
8	▥	△		-becomes grey END OF TEST HOLE AT 8.0 m UPON COMPLETION: -No slough -Dry BACKFILLED WITH DRILL CUTTINGS	8
9					9
10					10

BOREHOLE LOG 19-3752-0.GPJ THRBR_AB.GDT 13/5/02

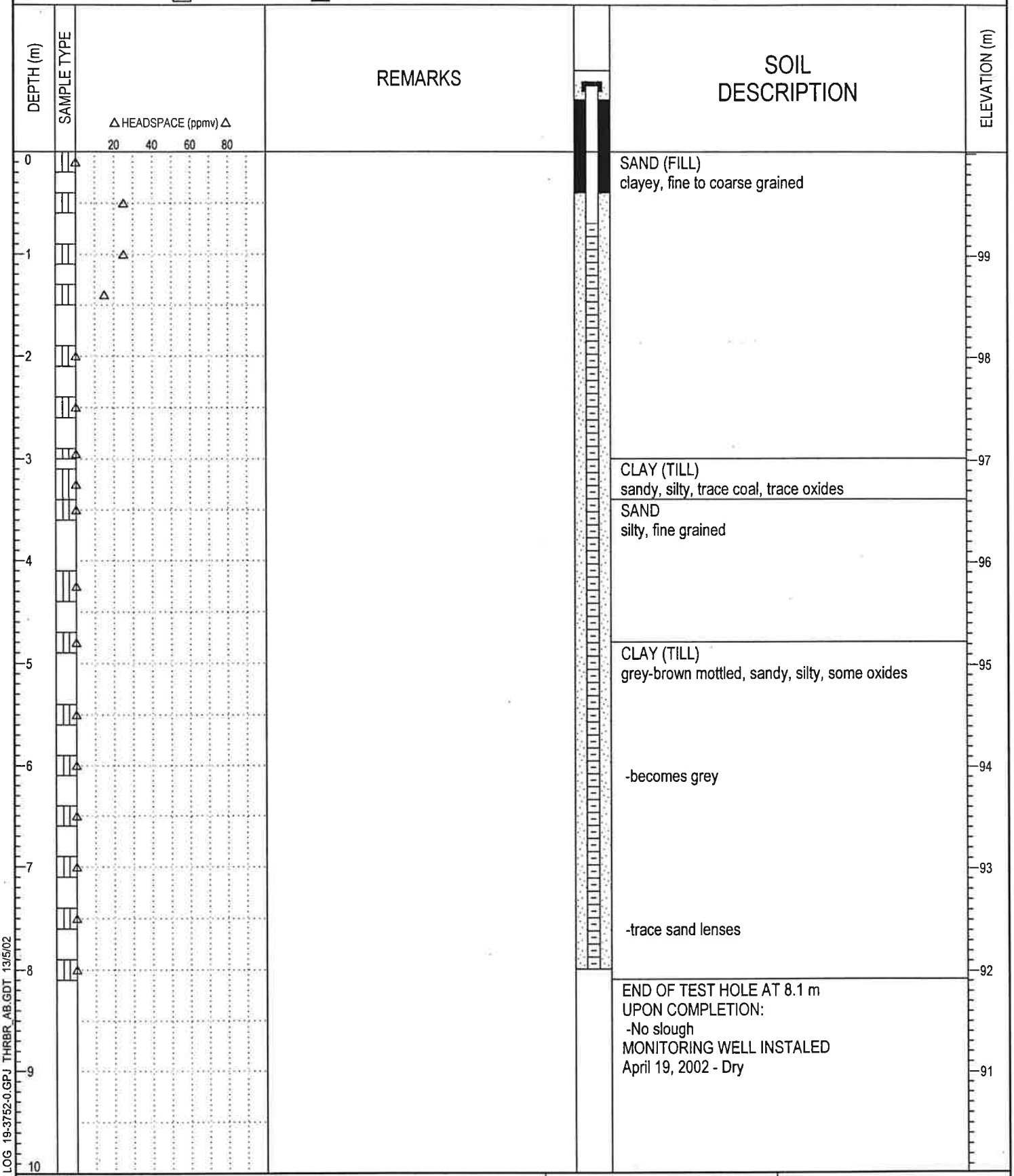
THURBER **Thurber Environmental Consultants Ltd.**
Edmonton, Alberta

LOGGED BY: KD	COMPLETION DEPTH: 8.0 m
REVIEWED BY: MFH	COMPLETION DATE: 9/4/02
	Page 1 of 1

CLIENT: A D Williams	PROJECT: Phase II ESA - Clandonald	BOREHOLE NO: **CD02-07**
DRILLING COMPANY: McAllister Holdings Ltd.	DATE DRILLED: April 9, 2002	PROJECT NO: 19-3752-0
DRILL/METHOD: Solid Stem Auger	LOCATION: See Dwg. 19-3752-0-2	ELEVATION: 100.02 (m)

SAMPLE TYPE: GRAB SAMPLE

BACKFILL TYPE: SAND, BENTONITE



BOREHOLE LOG 19-3752-0.GPJ THRBR_AB.GDT 13/5/02

THURBER

Thurber Environmental Consultants Ltd.
Edmonton, Alberta

LOGGED BY: KD	COMPLETION DEPTH: 8.1 m
REVIEWED BY: MFH	COMPLETION DATE: 9/4/02
	Page 1 of 1

APPENDIX D

Laboratory Reports

THURBER

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
SUITE 200, 9636 - 51 AVENUE
EDMONTON, AB
CANADA T6E 6A5

Attention: NEAL FERNUIK

Report Date: 2002/04/16

Your P.O. #: 19-3752-0
Your Project #: 19-3752-0
Site: CLANDONALD, AB

RECEIVED
APR 24 2002
NHF

ANALYTICAL REPORT

MAXXAM JOB #: A203233
Received: 2002/04/11, 9:00

Sample Matrix: SOIL
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX (MSD)	3	N/A	2002/04/15	CAL SOP# 0048 E1034R4	GC/MS-PURGE & TRAP
Moisture (ccme)	3	2002/04/15	2002/04/15	CAL SOP# 0028, E1062R5	
Oil % (Mineral, Gravimetric, hexane,Sil)	3	N/A	2002/04/16	CAL SOP# 0065	CCME
Lead	3	N/A	2002/04/16		ICP-AES
Purgeable Hydrocarbons C6-C10	3	2002/04/15	2002/04/16	CAL SOP# 0066	CCME
Particle Size by Wet Sieve (75 micron)	3	2002/04/16	2002/04/16	CAL SOP# 0104	GRAVIMETRIC
Total Extractable Hydrocarbons (CCME)	3	2002/04/15	2002/04/12	CAL SOP# 0066	CCME

MAXXAM Analytics Inc.

AZMINA MERALI

AM/ns
encl.

Total Cover pages: 1

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	:	CD02-01 G9 3.9-4.1	Maxxam Sample Number	:	313530
Sample Date & Time	:	2002/04/09	Maxxam Job Number	:	CA203233
Sampled By	:	KD	Sample Access	:	
Sample Type	:		Sample Matrix	:	SOIL
Sample Received Date		2002/04/11	Report Date	:	2002/04/16
Sample Station Code	:				

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Physical Properties						
Moisture	16	%	BAL	170613	1	2
Sieve - #200 (>0.075mm -TS)	14	%	SIEV	170775	0.01	0.02
Sieve - Pan	86	%	SIEV	170775	0.01	0.02

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	:	CD02-01 G9 3.9-4.1	Maxxam Sample Number	:	313530
Sample Date & Time	:	2002/04/09	Maxxam Job Number	:	CA203233
Sampled By	:	KD	Sample Access	:	
Sample Type	:		Sample Matrix	:	SOIL
Sample Received Date		2002/04/11	Report Date	:	2002/04/16
Sample Station Code	:				

Elements by Atomic Spectroscopy

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Elements						
Total Lead (Pb)	5.7	mg/kg	ICPM	170710	0.3	0.6

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	: CD02-01 G9 3.9-4.1	Maxxam Sample Number	: 313530
Sample Date & Time	: 2002/04/09	Maxxam Job Number	: CA203233
Sampled By	: KD	Sample Access	:
Sample Type	:	Sample Matrix	: SOIL
Sample Received Date	2002/04/11	Report Date	: 2002/04/16
Sample Station Code	:		

Petroleum Hydrocarbons (CCME Tier 1)

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Ext. Pet. Hydrocarbon						
F1 (C06-C10) - BTEX	<20	mg/kg	GC/FID	170611	20	40
F2 (C11-C16 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F3 (C17-C34 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F4 (C35-C50 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F4G-sg (Gravimetric HC-Silica Gel)	<1000	mg/kg	GRAV	170427	1000	2000
Reached Baseline at C50	YES	mg/kg	GC/FID	170426	N/A	N/A

N/A = Not Applicable
MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Results for F1, (F1-BTEX), and BTEX are reported on a dry weight basis.
F2,F3 and F4 are reported on a dry weight basis. Silica gel cleanup was used on F2, F3 and F4.
F4G is reported on a dry weight basis. Silica gel cleanup was used for F4G.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	:	CD02-01 G9 3.9-4.1	Maxxam Sample Number	:	313530
Sample Date & Time	:	2002/04/09	Maxxam Job Number	:	CA203233
Sampled By	:	KD	Sample Access	:	
Sample Type	:		Sample Matrix	:	SOIL
Sample Received Date		2002/04/11	Report Date	:	2002/04/16
Sample Station Code	:				

Volatile Organics by GC-MS

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
VOLATILES						
Purgeable (MeOH) Benzene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) Toluene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) Ethylbenzene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) m & p-Xylene	<0.08	mg/kg	PT/MSD	170414	0.08	0.2
Purgeable (MeOH) o-Xylene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Surrogate Recoveries (%):						
D8-TOLUENE (sur.):	100	Control Limits: 80 - 117				

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	: CD02-03 G9 3.9-4.1	Maxxam Sample Number	: 313531
Sample Date & Time	: 2002/04/09	Maxxam Job Number	: CA203233
Sampled By	: KD	Sample Access	:
Sample Type	:	Sample Matrix	: SOIL
Sample Received Date	2002/04/11	Report Date	: 2002/04/16
Sample Station Code	:		

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Physical Properties						
Moisture	11	%	BAL	170613	1	2
Sieve - #200 (>0.075mm -TS)	44	%	SIEV	170775	0.01	0.02
Sieve - Pan	56	%	SIEV	170775	0.01	0.02

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	:	CD02-03 G9 3.9-4.1	Maxxam Sample Number	:	313531
Sample Date & Time	:	2002/04/09	Maxxam Job Number	:	CA203233
Sampled By	:	KD	Sample Access	:	
Sample Type	:		Sample Matrix	:	SOIL
Sample Received Date		2002/04/11	Report Date	:	2002/04/16
Sample Station Code	:				

Elements by Atomic Spectroscopy

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Elements						
Total Lead (Pb)	4.9	mg/kg	ICPM	170710	0.3	0.6

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	:	CD02-03 G9 3.9-4.1	Maxxam Sample Number	:	313531
Sample Date & Time	:	2002/04/09	Maxxam Job Number	:	CA203233
Sampled By	:	KD	Sample Access	:	
Sample Type	:		Sample Matrix	:	SOIL
Sample Received Date		2002/04/11	Report Date	:	2002/04/16
Sample Station Code	:				

Petroleum Hydrocarbons (CCME Tier 1)

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Ext. Pet. Hydrocarbon						
F1 (C06-C10) - BTEX	<20	mg/kg	GC/FID	170611	20	40
F2 (C11-C16 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F3 (C17-C34 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F4 (C35-C50 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F4G-sg (Gravimetric HC-Silica Gel)	<1000	mg/kg	GRAV	170427	1000	2000
Reached Baseline at C50	YES	mg/kg	GC/FID	170426	N/A	N/A

N/A = Not Applicable
MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Results for F1, (F1-BTEX), and BTEX are reported on a dry weight basis.
F2,F3 and F4 are reported on a dry weight basis. Silica gel cleanup was used on F2, F3 and F4.
F4G is reported on a dry weight basis. Silica gel cleanup was used for F4G.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	:	CD02-03 G9 3.9-4.1	Maxxam Sample Number	:	313531
Sample Date & Time	:	2002/04/09	Maxxam Job Number	:	CA203233
Sampled By	:	KD	Sample Access	:	
Sample Type	:		Sample Matrix	:	SOIL
Sample Received Date		2002/04/11	Report Date	:	2002/04/16
Sample Station Code	:				

Volatile Organics by GC-MS

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
VOLATILES						
Purgeable (MeOH) Benzene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) Toluene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) Ethylbenzene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) m & p-Xylene	<0.08	mg/kg	PT/MSD	170414	0.08	0.2
Purgeable (MeOH) o-Xylene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Surrogate Recoveries (%):						
D8-TOLUENE (sur.):	100	Control Limits: 80 - 117				

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	: CD02-04 G4 1.3-1.5	Maxxam Sample Number	: 313532
Sample Date & Time	: 2002/04/09	Maxxam Job Number	: CA203233
Sampled By	: KD	Sample Access	:
Sample Type	:	Sample Matrix	: SOIL
Sample Received Date	2002/04/11	Report Date	: 2002/04/16
Sample Station Code	:		

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Physical Properties						
Moisture	6.2	%	BAL	170613	1	2
Sieve - #200 (>0.075mm -TS)	63	%	SIEV	170775	0.01	0.02
Sieve - Pan	37	%	SIEV	170775	0.01	0.02

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	:	CD02-04 G4 1.3-1.5	Maxxam Sample Number	:	313532
Sample Date & Time	:	2002/04/09	Maxxam Job Number	:	CA203233
Sampled By	:	KD	Sample Access	:	
Sample Type	:		Sample Matrix	:	SOIL
Sample Received Date		2002/04/11	Report Date	:	2002/04/16
Sample Station Code	:				

Elements by Atomic Spectroscopy

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Elements						
Total Lead (Pb)	2.6	mg/kg	ICPM	170710	0.3	0.6

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	: CD02-04 G4 1.3-1.5	Maxxam Sample Number	: 313532
Sample Date & Time	: 2002/04/09	Maxxam Job Number	: CA203233
Sampled By	: KD	Sample Access	:
Sample Type	:	Sample Matrix	: SOIL
Sample Received Date	2002/04/11	Report Date	: 2002/04/16
Sample Station Code	:		

Petroleum Hydrocarbons (CCME Tier 1)

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Ext. Pet. Hydrocarbon						
F1 (C06-C10) - BTEX	<20	mg/kg	GC/FID	170611	20	40
F2 (C11-C16 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F3 (C17-C34 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F4 (C35-C50 Hydrocarbons)	<10	mg/kg	GC/FID	170426	10	20
F4G-sg (Gravimetric HC-Silica Gel)	<1000	mg/kg	GRAV	170427	1000	2000
Reached Baseline at C50	YES	mg/kg	GC/FID	170426	N/A	N/A

N/A = Not Applicable
MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Results for F1, (F1-BTEX), and BTEX are reported on a dry weight basis.
F2,F3 and F4 are reported on a dry weight basis. Silica gel cleanup was used on F2, F3 and F4.
F4G is reported on a dry weight basis. Silica gel cleanup was used for F4G.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Sample Description	: CD02-04 G4 1.3-1.5	Maxxam Sample Number	: 313532
Sample Date & Time	: 2002/04/09	Maxxam Job Number	: CA203233
Sampled By	: KD	Sample Access	:
Sample Type	:	Sample Matrix	: SOIL
Sample Received Date	2002/04/11	Report Date	: 2002/04/16
Sample Station Code	:		

Volatile Organics by GC-MS

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
VOLATILES						
Purgeable (MeOH) Benzene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) Toluene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) Ethylbenzene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Purgeable (MeOH) m & p-Xylene	<0.07	mg/kg	PT/MSD	170414	0.07	0.14
Purgeable (MeOH) o-Xylene	<0.04	mg/kg	PT/MSD	170414	0.04	0.08
Surrogate Recoveries (%):						
D8-TOLUENE (sur.):	100	Control Limits: 80 - 117				

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3752-0
P.O. #: 19-3752-0
Site Reference: CLANDONALD, AB

Quality Assurance Report

Maxxam Job Number: CA203233

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
170414 CR	Calibration Check	Purgeable (MeOH) Benzene	2002/04/15		88	%	85 - 115
		Purgeable (MeOH) Toluene	2002/04/15		85	%	85 - 115
		Purgeable (MeOH) Ethylbenzene	2002/04/15		90	%	85 - 115
		Purgeable (MeOH) m & p-Xylene	2002/04/15		96	%	85 - 115
		Purgeable (MeOH) o-Xylene	2002/04/15		91	%	85 - 115
	SPIKE	Purgeable (MeOH) Benzene	2002/04/15		79	%	75 - 125
		Purgeable (MeOH) Toluene	2002/04/15		80	%	75 - 125
		Purgeable (MeOH) Ethylbenzene	2002/04/15		82	%	75 - 125
		Purgeable (MeOH) m & p-Xylene	2002/04/15		82	%	75 - 125
		Purgeable (MeOH) o-Xylene	2002/04/15		85	%	75 - 125
	BLANK	Purgeable (MeOH) D8-TOLUENE (sur.)	2002/04/15		100	%	
		Purgeable (MeOH) Benzene	2002/04/15	<0.04		mg/kg	
		Purgeable (MeOH) Toluene	2002/04/15	<0.04		mg/kg	
		Purgeable (MeOH) Ethylbenzene	2002/04/15	<0.04		mg/kg	
		Purgeable (MeOH) m & p-Xylene	2002/04/15	<0.07		mg/kg	
		Purgeable (MeOH) o-Xylene	2002/04/15	<0.04		mg/kg	
170426 JMA	Calibration Check	F2 (C11-C16 Hydrocarbons)	2002/04/12		103	%	N/A
		F3 (C17-C34 Hydrocarbons)	2002/04/12		102	%	N/A
		F4 (C35-C50 Hydrocarbons)	2002/04/12		99	%	N/A
	BLANK	F2 (C11-C16 Hydrocarbons)	2002/04/12	<10		mg/kg	
		F3 (C17-C34 Hydrocarbons)	2002/04/12	<10		mg/kg	
		F4 (C35-C50 Hydrocarbons)	2002/04/12	<10		mg/kg	
		Reached Baseline at C50	2002/04/12	YES		mg/kg	
170427 LSH	BLANK	F4G-sg (Gravimetric HC-Silica Gel)	2002/04/16	<1000		mg/kg	
170611 JB	Calibration Check	F1 (C06-C10) - BTEX	2002/04/15		0	%	N/A
	BLANK	F1 (C06-C10) - BTEX	2002/04/15	<20		mg/kg	
170613 RC	RPD	Moisture	2002/04/15	NC		%	N/A
170710 NR	Calibration Check	Total Lead (Pb)	2002/04/16		87	%	N/A
	BLANK	Total Lead (Pb)	2002/04/16	<0.3		mg/kg	
	RPD	Total Lead (Pb)	2002/04/16	NC		%	N/A

N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
SUITE 200, 9636 - 51 AVENUE
EDMONTON, AB
CANADA T6E 6A5

RECEIVED
MAY 0 6 2002
DHF

Attention: NEAL FERNUIK

Report Date: 2002/04/30

Your Project #: 19-3572-0
Site: CLANDONALD

ANALYTICAL REPORT

MAXXAM JOB #: A203599
Received: 2002/04/22, 14:55

Sample Matrix: WATER
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX and purgeables (C6-C10-BTEX) (MSD)(1)	1	N/A	2002/04/25	CAL SOP# 0048, E1034R4	GC/MS-PURGE & TRAP
Total Extractable Hydrocarbon C11-C30(1)	1	N/A	2002/04/25	CAL SOP# 0063, EDM SOP# 0047	Mod. EPA 3610A, 8000
Extractable Hydrocarbons (C11-C16)(1)	1	2002/04/25	2002/04/30	CAL SOP# 0066	CCME

(1) This test was performed by Maxxam Edmonton

MAXXAM Analytics Inc.

AZMINA MERALI
Manager - Inorganics

AM/pc
encl.

Total Cover pages: 1

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3572-0
P.O. #:
Site Reference: CLANDONALD

Sample Description : CS02-02
Sample Date & Time : 2002/04/19
Sampled By : KD
Sample Type : Grab
Sample Received Date : 2002/04/22
Sample Station Code :

Maxxam Sample Number : 315798
Maxxam Job Number : EA203599
Sample Access :
Sample Matrix : WATER
Report Date : 2002/04/30

Petroleum Hydrocarbons (CCME Tier 1)

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
Ext. Pet. Hydrocarbon						
F2 (C11-C16 Hydrocarbons)	<0.1	mg/L	GC/FID	171757	0.1	0.2

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3572-0
P.O. #:
Site Reference: CLANDONALD

Sample Description	:	CS02-02	Maxxam Sample Number	:	315798
Sample Date & Time	:	2002/04/19	Maxxam Job Number	:	EA203599
Sampled By	:	KD	Sample Access	:	
Sample Type	:	Grab	Sample Matrix	:	WATER
Sample Received Date		2002/04/22	Report Date	:	2002/04/30
Sample Station Code	:				

Volatile Organics by GC-MS

PARAMETER DESCRIPTION	RESULTS	Units	INST.	QA/QC Batch	MDL	RDL
VOLATILES						
Purgeable Benzene	<0.0004	mg/L	PT/MSD	171837	0.0004	0.0008
Purgeable Toluene	<0.0004	mg/L	PT/MSD	171837	0.0004	0.0008
Purgeable Ethylbenzene	<0.0004	mg/L	PT/MSD	171837	0.0004	0.0008
Purgeable Xylenes (Total)	<0.0008	mg/L	PT/MSD	171837	0.0008	0.002
Purgeable F1 (C06-C10) - BTEX	<0.1	mg/L	PT/MSD	171837	0.1	0.2
Surrogate Recoveries (%):						
D8-TOLUENE (sur.):	107	Control Limits: 88 - 110				

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3572-0
P.O. #:
Site Reference: CLANDONALD

Sample Description	: CS02-02	Maxxam Sample Number	: 315798
Sample Date & Time	: 2002/04/19	Maxxam Job Number	: EA203599
Sampled By	: KD	Sample Access	:
Sample Type	: Grab	Sample Matrix	: WATER
Sample Received Date	2002/04/22	Report Date	: 2002/04/30
Sample Station Code	:		

Extractable Hydrocarbons by GC-FID

PARAMETER DESCRIPTION	RESULTS	Units	BOILING RANGE	QA/QC Batch	MDL	RDL
Extractable Hydrocarbons						
C 11	<0.02	mg/L	174.3 TO 196.0	171811	0.02	0.04
C 12	<0.02	mg/L	196.1 TO 216.0	171811	0.02	0.04
C 13	<0.02	mg/L	216.1 TO 236.0	171811	0.02	0.04
C 14	<0.02	mg/L	236.1 TO 253.0	171811	0.02	0.04
C 15	<0.02	mg/L	253.1 TO 271.0	171811	0.02	0.04
C 16	<0.02	mg/L	271.1 TO 287.0	171811	0.02	0.04
C 17	<0.02	mg/L	287.1 TO 302.0	171811	0.02	0.04
C 18	<0.02	mg/L	302.1 TO 317.0	171811	0.02	0.04
C 19	<0.02	mg/L	317.1 TO 331.0	171811	0.02	0.04
C 20	<0.02	mg/L	331.1 TO 344.0	171811	0.02	0.04
C 21	<0.02	mg/L	344.1 TO 357.0	171811	0.02	0.04
C 22	<0.02	mg/L	357.1 TO 366.0	171811	0.02	0.04
C 23	<0.02	mg/L	366.1 TO 380.0	171811	0.02	0.04
C 24	<0.02	mg/L	380.1 TO 391.0	171811	0.02	0.04
C 25	<0.02	mg/L	391.1 TO 402.0	171811	0.02	0.04
C 26	<0.02	mg/L	402.1 TO 412.0	171811	0.02	0.04
C 27	<0.02	mg/L	412.1 TO 422.0	171811	0.02	0.04
C 28	<0.02	mg/L	422.1 TO 432.0	171811	0.02	0.04
C 29	<0.02	mg/L	432.1 TO 441.0	171811	0.02	0.04
C 30	<0.02	mg/L	441.1 TO 449.0	171811	0.02	0.04
Total Extractables C11 to C30	<0.7	mg/L		171811	0.7	1.4

Surrogate Recoveries (%):

OCTANE (sur.):	122	Control Limits: 66 - 131

MDL = Method Detection Limit - Calculated on the basis of the instrument detection level, the dilution used, and the weight of the sample.
RDL = Reliable Detection Limit (2 x MDL)
Results are not corrected for surrogate or moisture values unless otherwise stated.

Maxxam Analytics Inc

THURBER ENVIRONMENTAL CONSULTANTS LTD.
Attention: NEAL FERNUIK
Client Project #: 19-3572-0
P.O. #:
Site Reference: CLANDONALD

Quality Assurance Report

Maxxam Job Number: EA203599

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
171757 CD1	Calibration Check	F2 (C11-C16 Hydrocarbons)	2002/04/30		110	%	N/A
	BLANK	F2 (C11-C16 Hydrocarbons)	2002/04/30	<0.15		mg/L	
171811 CD1	Calibration Check	C 11	2002/04/25		106	%	75 - 125
		C 15	2002/04/25		115	%	75 - 125
		C 24	2002/04/25		101	%	75 - 125
		C 30	2002/04/25		113	%	75 - 125
	BLANK	OCTANE (sur.)	2002/04/25		105	%	
		C 11	2002/04/25	<0.02		mg/L	
		C 12	2002/04/25	<0.02		mg/L	
		C 13	2002/04/25	<0.02		mg/L	
		C 14	2002/04/25	<0.02		mg/L	
		C 15	2002/04/25	<0.02		mg/L	
		C 16	2002/04/25	<0.02		mg/L	
		C 17	2002/04/25	<0.02		mg/L	
		C 18	2002/04/25	<0.02		mg/L	
		C 19	2002/04/25	<0.02		mg/L	
		C 20	2002/04/25	<0.02		mg/L	
		C 21	2002/04/25	<0.02		mg/L	
		C 22	2002/04/25	<0.02		mg/L	
		C 23	2002/04/25	<0.02		mg/L	
		C 24	2002/04/25	<0.02		mg/L	
		C 25	2002/04/25	<0.02		mg/L	
		C 26	2002/04/25	<0.02		mg/L	
		C 27	2002/04/25	<0.02		mg/L	
		C 28	2002/04/25	<0.02		mg/L	
		C 29	2002/04/25	<0.02		mg/L	
		C 30	2002/04/25	<0.02		mg/L	
		Total Extractables C11 to C30	2002/04/25	<0.7		mg/L	
171837 CD1	Calibration Check	Purgeable Benzene	2002/04/25		103	%	85 - 115
		Purgeable Toluene	2002/04/25		98	%	85 - 115
		Purgeable Ethylbenzene	2002/04/25		92	%	85 - 115
	BLANK	Purgeable D8-TOLUENE (sur.)	2002/04/25		106	%	
		Purgeable Benzene	2002/04/25	<0.0004		mg/L	
		Purgeable Toluene	2002/04/25	<0.0004		mg/L	
		Purgeable Ethylbenzene	2002/04/25	<0.0004		mg/L	
		Purgeable Xylenes (Total)	2002/04/25	<0.0008		mg/L	
		Purgeable F1 (C06-C10) - BTEX	2002/04/25	<0.1		mg/L	

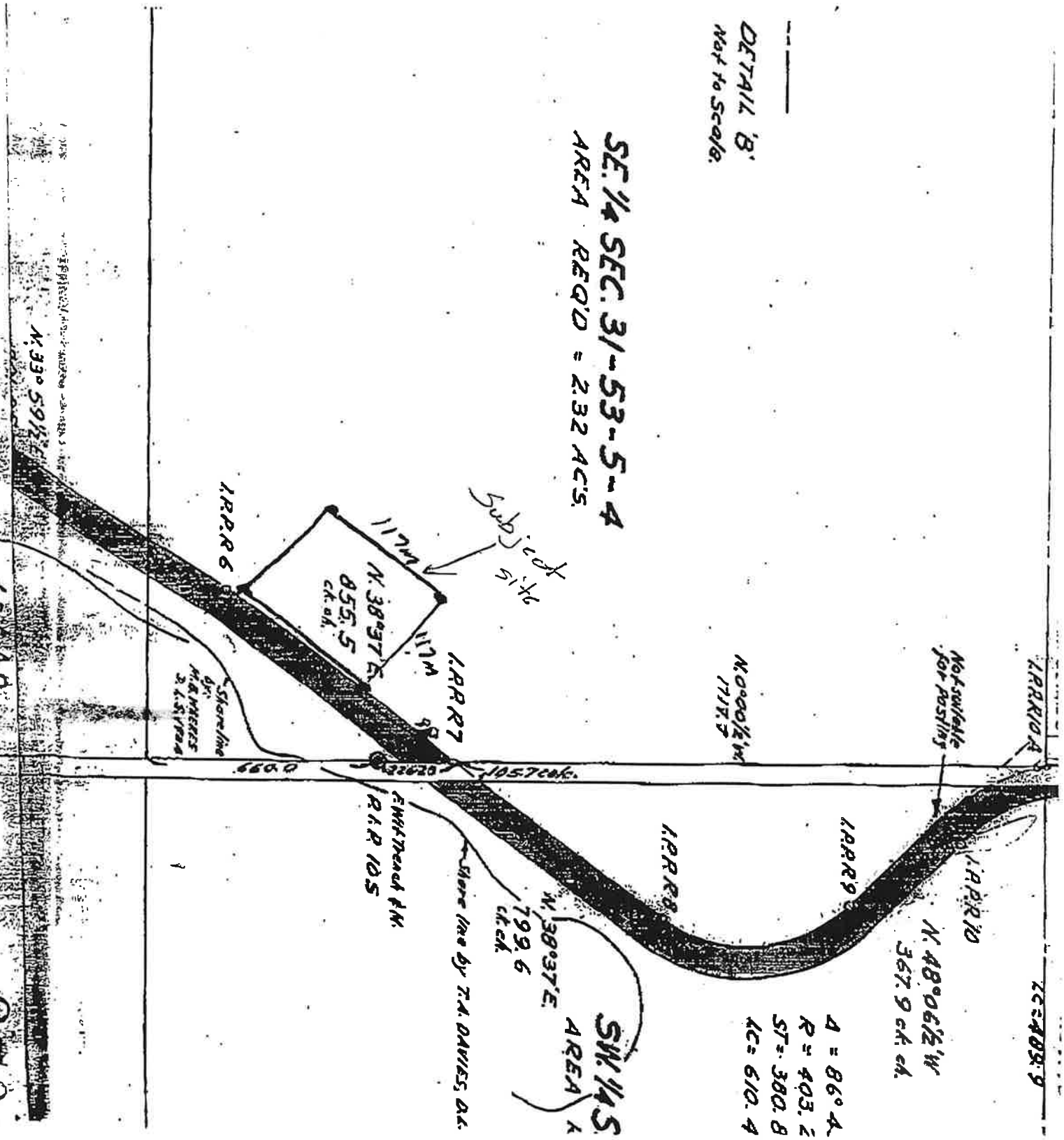
N/A = Not Applicable

APPENDIX E

Let'R Buck Phase I ESA Report

THURBER

The Accredited Consulting Engineer shall provide a proposal for services and an estimate of fees to conduct the Environmental Site Assessment to the satisfaction of the Minister.



1.0 INTRODUCTION

PSE 31-53-5-W4

I was contacted by Randy Belliveau of the County of Vermillion River to audit a site north of the town of Clandonald, Alberta. The acreage site was once used as a garage facility. There was concerns that there may have been under ground tanks in use at this facility at one time. There is presently no under ground tanks at this location. County equipment and personnel were used to excavate two holes in the areas that were felt to have possibly contained the underground tanks. Excavations were completed to a depth on approximately ten feet.

2.0 FIELD RECONNAISSANCE

During the time of excavation there was no evidence of ground disturbance. However, due to the sandy soil conditions and the age of the site this is very hard to determine. There were no indication of hydrocarbons or other contaminants in the excavation areas. There was no staining or odors on the walls of the excavation, nor on the floor of the excavation. To ensure that there were no hydrocarbons present two composite samples were taken from the excavations comprising of wall and floor material. These were sent to Maxxam Analytics Inc. in Calgary and submitted to tests for extractable hydrocarbons by GC/FID and volatile organics by GC/MS.

3.0 ATTACHED PHOTOS

Photograph #1: Shows old garage and surrounding excavations.

Photograph #2: Shows excavation area number one.

Photograph #3: Shows excavation area number two.

N

CD02-01

CONCRETE

BM

SHED #1

CD02-02

CD02-07

OFFICE SHED

SHED #2

CD02-06

CD02-03

CD02-04

CD02-05

DECK

HOUSE

DOMESTIC WELL

RR 55

RAFT LAKE

LEGEND

- APPROXIMATE LOCATION OF TEST HOLES
- APPROXIMATE LOCATION OF MONITORING WELLS
- BENCHMARK
- SURFACE DRAINAGE
- FENCE LINE
- GAS LINE
- OVERHEAD POWER LINE
- POWER POLE
- TELEPHONE LINE
- INFERRED GROUNDWATER DIRECTION

0 2 4 6 8 10m

SCALE

THURBER PROJECT #19-3752-0

ENGINEER	DS
DRAWN	ZD
DATE	APRIL 2002
APPROVED	
SCALE	1:200

A. D. WILLIAMS

STIE PLAN SHOWING TEST HOLE LOCATIONS

PHASE II ESA

CLANDONALD, AB

THURBER

DRAWING No. 19-3752-0-2