## **APPENDIX B**

**Borehole Logs** 

LC	G	NO: EW-	01							BOREHOLE LO	G
PAGE	≣ 1 0	F 1									
			4-000								_
PRO.	IECT I	NAME Cold Lake	CFB	PRO	OJE(	CT LO	CATION	Cold Lak	ke, AB	i	-
			Core Drilling								
			Stem	NO	RTH	ING _	EVATION			EASTINGTOC ELEVATION	—
		<b>E</b> 9/30/16 <b>BY</b> Ben Laird	CHECKED BY	GR	OUN	ID ELE	TER LEV	EL 🔽	( )	TOC ELEVATION	—
			WELL DIAMETER 3"								
DЕРТН (m)	GRAPHIC LOG		MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
- 0.2											0.2
- 0.4											0.2
- 0.6											0.6
- 0.8											
										l Ki≟kii ⊢	0.8
- 1.0										l	1.0
- 1.2										l (%)=   (%)   -	1.2
- 1.4											1.4
- 1.6											1.6
- 1.8										l Maria	1.8
- 2.0										l Service F	2.0
- 2.2 - 2.4											· 2.2 · 2.4
- 2.6											2.4
- 2.8											2.8
- 3.0						61	1-1-1				3.0
- 3.2											3.2
- 3.4											3.4
- 3.6											3.6
											3.8

NOTES: LAB ANALYSIS: SAMPLE TYPE:
mas! = Meters Above Sea Level M= Metals F1 = PHC F1 Split Spoon

LEL = Lower Explosive Limit P = PAH L/H = LEPH/HEPH
G = GLYCOL VPH = VPH

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party.

ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO:	EW-02							BOREHOLE LO	G
PAGE 1 OF 1									
	R _702584-000				/GSC				
PROJECT NAME _	Cold Lake CFB	PRO	)JE	CT LO	CATION	Cold Lak	ke, AB		
	ACTOR Core Drilling	PR0	OJE	CTION	I				
DRILLING METHOI DRILL DATE 9/30	D Hollow Stem							EASTINGTOC ELEVATION	
	Laird CHECKED BY								
	6" WELL DIAMETER 3"								
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8									- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 3.0 - 3.2 - 3.3 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO: EW	<b>'-03</b>							<b>BOREHOLE LOG</b>
PAGE 1 OF 1								
PROJECT NUMBER 7025	84-000	CLI	ENT	_PW	/GSC			
PROJECT NAME Cold La	ke CFB	PRO	OJE	CT LO	CATION	Cold Lak	ke, AB	<u> </u>
DRILLING CONTRACTOR	Core Drilling	PRO	OJE	CTION	I			
	ow Stem							EASTING
DRILL DATE 9/30/16  LOGGED BY Ben Laird	CHECKED BY		OUN	ID ELI	EVATION ATER LEV	EL V	( )	TOC ELEVATION
	WELL DIAMETER 3"							
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E) H
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8								- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.4 - 2.6 - 2.8 - 3.0 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG I	NO: EW-	04							BOREHOLE LO	)G
PAGE 1 OF	F 1									
PROJECT N	NUMBER 702584	I-000	CLI	ENT	_PW	'GSC				
		CFB		)JE(	CT LO	CATION	Cold Lak	ke, AB		
DRILLING C	CONTRACTOR _C	Core Drilling	PR0	IJΕ	CTION	l				
		Stem	NOI	RTH	ING _				EASTING	
	<b>E</b> 9/30/16 <b>Y</b> Ben Laird	CHECKED BY		OUN	ID ELE	EVATION TER LEV	FI V	( )	TOC ELEVATION	
		WELL DIAMETER 3"								
DEPTH (m) GRAPHIC LOG		MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DЕРТН (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8										- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO	D: <i>EW-05</i>								BOREHOL	E LOG
PAGE 1 OF 1										
						'GSC				
PROJECT NAME	E Cold Lake CFB		PRO	)JE(	CT LO	CATION	Cold Lak	ke, AB		
		illing	PRO	)JE	CTION	l				
	HOD <u>Hollow Stem</u> 9/30/16								EASTING TOC ELEVATION	
		CHECKED BY								
		WELL DIAMETER 3"								
DEPTH (m) GRAPHIC LOG	MATE	ERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGR	MA DEPTH (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8										- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.4 - 2.6 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO	: <b>EW</b> -06							BOREHOLE LOG
PAGE 1 OF 1								
PROJECT NUMBE	<b>ER</b> _702584-000	CLI	ENT	_PW	'GSC			
PROJECT NAME	Cold Lake CFB	PRO	)JE(	CT LO	CATION	Cold Lak	e, AB	
DRILLING CONTR	RACTOR Core Drilling	PR0	IJΕ	CTION	l			
	DD Hollow Stem	NOI	RTH	ING _				EASTING
	80/16 en Laird CHECKED BY		OUN	D ELE	EVATION TER LEV	FI V	( )	TOC ELEVATION
	WELL DIAMETER 3"							
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8								

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LC	)G	NO: EW-	07							BOREHOLE LOG
PAG	E 1 C	DF 1								
			1-000							
PRO	JECT I	NAME Cold Lake	CFB	PR	OJE	CT LO	CATION	Cold Lak	ke, AB	i
			Core Drilling							
			Stem	NO	RTH	ING _	TVATION.			EASTING
		<b>E</b> 9/30/16 <b>BY</b> Ben Laird	CHECKED BY	GR GR	OUN	D WA	TER LEV	EL 🔽	( )	TOC ELEVATION
			WELL DIAMETER 3"							
DEPTH (m)	GRAPHIC LOG		MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E) HELD
- 0.2										- - - 0
- 0.4										
- 0.6										
- 0.8										
- 1.0										l
- 1.2										- 1 - 1
- 1.4										
- 1.6										
- 1.8 - 2.0										
- 2.2										- 2
- 2.4										
- 2.6										_ 2
- 2.8										- 2
- 3.0										- 3
- 3.2										- 3
- 3.4										_ 3
- 3.6										
										- 3

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO: EW	<b>'-08</b>							<b>BOREHOLE LOC</b>
PAGE 1 OF 1								
PROJECT NUMBER 7025	584-000	CLI	ENT	PW	'GSC			
PROJECT NAME Cold La	ke CFB	PRO	)JE(	CT LO	CATION	Cold Lak	ke, AB	
DRILLING CONTRACTOR	Core Drilling		)JE(	CTION	l			
	ow Stem	NOI	RTH	ING _				EASTING
DRILL DATE 10/1/16  LOGGED BY Ben Laird	CHECKED BY		OUN	D WA	TER LEV	EL 🔽	( )	TOC ELEVATION
	WELL DIAMETER 3"							
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8								

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LC	)G	NO: EW-	10							BOREHOLE LOG
PAG	E 1 C	OF 1								
			1-000							
PRO	JECT I	NAME Cold Lake	CFB	PR	OJE	CT LO	CATION	Cold Lak	ke, AB	3
			Core Drilling							
			Stem	NO	RTH	ING _	TVATION			EASTING
		TE 10/2/16  BY Ben Laird	CHECKED BY	GR GR	OUN	ID ELE	TER LEV	EL V	( )	TOC ELEVATION
			WELL DIAMETER 3"							
DEPTH (m)	GRAPHIC LOG		MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E) ###################################
- 0.2										
- 0.4										- 0.
- 0.6										
- 0.8										- 0.
- 1.0										- 1.
- 1.2										
- 1.4										
- 1.6										
- 1.8										
- 2.0										- 2.
- 2.2										- 2.
- 2.4										- 2.
- 2.6										- 2.
- 2.8										- 2.
- 3.0										- 3.
- 3.2										- 3.
- 3.4										- 3.
- 3.6										- 3.
										- 3.

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO	: <b>EW-15</b>							BOREHOLE LOG
PAGE 1 OF 1								
PROJECT NUMBI	ER _702584-000	CLI	ENT	PW	'GSC			
	Cold Lake CFB		OJE	CT LO	CATION	Cold Lak	e, AB	
DRILLING CONTE	RACTOR Core Drilling		OJE	CTION	l			
	OD Hollow Stem	NOI	RTH	ING _				EASTING
	2/2/16 CHECKED BY CHECKED BY		OUN	D ELE	EVATION TER I EV	FI 🔽	( )	TOC ELEVATION
	R 6" WELL DIAMETER 3"							
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E) H
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8								- 0 - 0 - 0 - 0 - 1 - 1 - 1 - 1 - 1 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 3 - 3 - 3 - 3

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



RELLING CONTRACTOR Core Drilling PROJECTION  RELLING METHOD Hollow Stem NORTHING ROUND ELEVATION TOC ELEVAT  GROUND ELEVATION GROUND WATER LEVEL ▼ ()  GROUND WATER LEVEL		IOLE LO	G
PROJECT NAME COID Lake CFB  PROJECT LOCATION Coid Lake, AB  PROJECTION  PROJE	AGI		
PROJECT NAME Cold Lake CFB  PROJECT LOCATION Cold Lake, AB  PR	RO		
NORTHING			
RILL DATE 10/2/16 _OGGED BY _Ben Laird	RIL		
CHECKED BY   Sen_Laird   CHECKED BY   GROUND WATER LEVATION   Material Description   Mat			
MATERIAL DESCRIPTION		)N	
02 04 06 08 10 12 14 16 18 20 22 24 26 28 30 32 34 36	IOLI		
0 0 2 0 4 0 4 0 6 0 6 0 8 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	DEРТН (m)	DIAGRAM	DЕРТН (m)
04			- - 0.2
0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6			- 0.4
0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6			- - 0.6
1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6			- 0.8
14			- - 1.0
1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6	1.2		- - 1.2
1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6	1.4		- - 1.4
2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6	1.6		- - 1.6
22 - 24 - 26 - 28 - 30 - 32 - 34 - 36 - 36	1.8		- - 1.8
- 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6	2.0		- 2.0
- 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6	2.2		_ 2.2
- 2.8 - 3.0 - 3.2 - 3.4 - 3.6	2.4		_ 2.4
3-3-4	2.6		_ 2.6
3.3 3.4 3.6 3.6	2.8		_ 2.8
- 3.2 - 3.4 - 3.6	3.0		3.0
- 3.6	3.2		- 3.2 -
	3.4		- 3.4 -
- 3.8			— 3.6 –
	3.8		- 3.8 -



LOG I	NO: EW-	17							BOREHOLE LO	)G
PAGE 1 OF	F 1									
PROJECT N	NUMBER 702584	-000	CLI	ENT	PW	'GSC				
		CFB		)JE	CT LO	CATION	Cold Lak	ke, AB		
DRILLING C	CONTRACTOR _C	Core Drilling		IJΕ	CTION	l				
		Stem	NOI	RTH	ING _				EASTING	
	E 10/2/16  V Ben Laird	CHECKED BY	GR:	OUN	D ELE	EVATION TER LEV	FI V	( )	TOC ELEVATION	
		WELL DIAMETER 3"								
DEPTH (m) GRAPHIC LOG		MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8										- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.4 - 2.6 - 2.6 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO: EV	<i>V-18</i>							<b>BOREHOLE LOG</b>
PAGE 1 OF 1								
PROJECT NUMBER 702	2584-000	CLI	ENT	_PW	/GSC			
PROJECT NAME Cold L	ake CFB	PRO	OJE	CT LO	CATION	Cold Lak	ke, AB	
DRILLING CONTRACTOR	Core Drilling		OJE	CTION	I			
	Ilow Stem							EASTING
DRILL DATE 10/2/16 LOGGED BY Ben Laird	CHECKED BY		OUN	ID ELI	EVATION ATER LEV	EL V	( )	TOC ELEVATION
	WELL DIAMETER 3 "							
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E) H
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8								- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.4 - 2.6 - 2.8 - 3.0 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO:	<i>EW-19</i>							BOREHOLE LO	)G
PAGE 1 OF 1									
PROJECT NUMBER	702584-000	CLI	ENT	PW	GSC				
PROJECT NAME _	Cold Lake CFB	PRO	)JE	CT LO	CATION	Cold Lak	ke, AB		
DRILLING CONTRA	ACTOR Core Drilling	PRO	IJΕ	CTION	l				
	D Hollow Stem							EASTING	
DRILL DATE <u>10/3</u> LOGGED BY Ben	Laird CHECKED BY							TOC ELEVATION	
	6 " WELL DIAMETER _3 "								
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEРТН (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8									- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.8 - 3.0 - 3.6 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG I	NO: EW-2	20							BOREHOLE LO	)G
PAGE 1 OF	F 1									
PROJECT N	IUMBER _702584	-000	CLI	ENT	_PW	'GSC				
		CFB		)JE	CT LO	CATION	Cold Lak	ke, AB		
DRILLING C	CONTRACTOR C	Core Drilling		IJΕ	CTION	l				
		Stem	NOI	RTH	ING _				EASTING	
	E 10/3/16  V Ben Laird	CHECKED BY		OUN	D ELE	EVATION TER LEV	FI V	( )	TOC ELEVATION	
		WELL DIAMETER _3 "								
DEPTH (m) GRAPHIC LOG		MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8										- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LC	G	NO: EW-	21							BOREHOLE LOG
PAGI	E 1 O	F 1								
			4-000							
PRO	IECT I	NAME Cold Lake	CFB	PR	OJE	CT LC	CATION	Cold Lak	ke, AB	3
			Core Drilling							
			Stem	NO	RTH	ING _	=VATION			EASTING
		<b>E</b> 10/3/16 <b>BY</b> Ben Laird	CHECKED BY	GR GR	OUN	ID WA	TER LEV	EL V	( )	TOC ELEVATION
			WELL DIAMETER 3"							
DЕРТН (m)	GRAPHIC LOG		MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E)
- 0.2										-
- 0.4										
- 0.6										
- 0.8										
- 1.0										
- 1.2										
- 1.4										
- 1.6										
- 1.8										
- 2.0										
- 2.2 - 2.4										
- 2.6										
- 2.8										
- 3.0										
- 3.2					X		3-2-3			
- 3.4										
- 3.6										

NOTES: LAB ANALYSIS: SAMPLE TYPE:
mas! = Meters Above Sea Level M= Metals F1 = PHC F1 Split Spoon
three = Meters Relow Ground Surface L = Ingranics F2 = PHC F2.F4

G = GLYCOL VPH = VPH

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party.

ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG N	O: EW-22	2							BOREHOLE LO	G
PAGE 1 OF	1									
PROJECT NUM	MBER _ 702584-00	00	CLI	ENT	_PW	'GSC				
		В		)JE	CT LO	CATION	Cold Lak	e, AB		
DRILLING COI	NTRACTOR Core	e Drilling		IJΕ	CTION	l				
		em	NOI	RTH	ING _				EASTING	
-	10/2/16 Ben Laird	CHECKED BY		OUN	D ELE	EVATION TER LEV	FI V	( )	TOC ELEVATION	
		WELL DIAMETER 3"								
DEPTH (m) GRAPHIC LOG	N	IATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8										- 0.2 - 0.4 - 0.6 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.4 - 2.6 - 2.4 - 2.6 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO: I	EW-23							BOREHOLE LO	G
PAGE 1 OF 1									
PROJECT NUMBER	702584-000	CLI	ENT	_PW	/GSC				
PROJECT NAME <u>C</u>	old Lake CFB	PRO	)JE	CT LO	CATION	Cold Lak	ke, AB		
	CTOR Core Drilling	PRO	)JE	CTION	I				
DRILLING METHOD  DRILL DATE 10/3/1	Hollow Stem							EASTINGTOC ELEVATION	
	aird CHECKED BY								
	WELL DIAMETER 3"								
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8									- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NC	): EW-24							BOREHOLE LOG
PAGE 1 OF 1								
PROJECT NUME	BER _702584-000	CLI	ENT	_PW	'GSC			
	Cold Lake CFB		)JE	CT LO	CATION	Cold Lak	e, AB	
DRILLING CONT	RACTOR Core Drilling		IJΕ	CTION	l			
	HOD Hollow Stem	NO	RTH	ING _				EASTING
	0/2/16           Ben Laird         CHECKED BY		OUN	D ELE	EVATION TER LEV	FI V	( )	TOC ELEVATION
	R 6 "   WELL DIAMETER 3 "							
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM
- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 2.8 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8								

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



.C	G	NO: EW-25							BOREHOLE LO
١GI	E 1 O	F 1							
		NUMBER 702584-000				/GSC			
O.	JECT N	NAME Cold Lake CFB	PR	OJE	CT LC	CATION	Cold Lal	ke, AB	
		CONTRACTOR Tundra	PR	OJE	CTION	<b>I</b>			
		METHOD Hollow Stem							EASTING
		Y Ben Laird CHECKED BY							TOC ELEVATION
		METER _12 " WELL DIAMETER _3 "							mbgs ( )
,,,	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM
		SAND, brown, fine grained, loose, dry  1.52  SAND, grey, fine grained, loose, wet, hydrocarbon odour 2.90  CLAY, trace sand, grey, soft, moist 3.05				3-4-24-24			
3.6		End of Borehole at 3.96meters 3.96							

NOTES: LAB ANALYSIS: SAMPLE TYPE: masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
G = GLYCOL F1 = PHC F1 F2 = PHC F2-F4 PCB = PCB's Pes = Pesticides L/H = LEPH/HEPH VPH = VPH Split Spoon



	)G	NO: EW-26							<b>BOREHOLE LOG</b>
'AG	E 1 O	DF 1							
RO	JECT N	NUMBER _ 702584-000	CLI	ENT	_PW	/GSC			
RO	JECT N	NAME Cold Lake CFB	PRO	OJE	CT LC	CATION	Cold Lal	ke, AB	1
RIL	LING (	CONTRACTOR _Tundra							
		METHOD Hollow Stem							EASTING
		FE         3/10/17           3Y         Ben Laird         CHECKED BY							TOC ELEVATION
		METER 12" WELL DIAMETER 3"							mbgs ( )
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E) HELD
		SAND, trace gravel, brown, fine grained, loose, dry				_			
0.2									- 0. - 0.
0.4									
0.8									
1.0									- 1/
1.2									- 12
1.4									
1.6		SAND, brown, fine grained, loose, dry							
1.8						3-5-3-3			[ 1)
2.0				$/ \setminus$					- 2.1
2.2									2.
2.4									- 2
2.6									2.1
2.8		SAND, grey, fine grained, loose, wet, hydrocarbon odour <sup>2.90</sup>							- 2.
3.0		CLAY, trace sand, grey, soft, moist 3.05							3.
3.2						3-5-5-5			3.
3.4				$  / \rangle$					3.
3.8									- 3.
		End of Borehole at 3.96meters 3.96							

NOTES: LAB ANALYSIS: SAMPLE TYPE: masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
G = GLYCOL F1 = PHC F1 F2 = PHC F2-F4 PCB = PCB's Pes = Pesticides L/H = LEPH/HEPH VPH = VPH Split Spoon

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



1 IMBER								
MBER _ 702584-000								
				'GSC				
ME Cold Lake CFB	PRO	OJEC	CT LO	CATION	Cold Lak	e, AB		
ONTRACTOR _Tundra	PR	OJEC	CTION	l				
· <del></del>								
MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	3LOW COUNTS	/APOUR READINGS	AB ANALYSIS	WELL DIAGRAM	DEPTH (m)
SAND, trace gravel, brown, fine grained, loose, dry, hydrocarbon odour  SAND, grey, fine grained, loose, wet, hydrocarbon odour  1.83  CLAY, trace sand, grey, soft, moist, hydrocarbon odour  3.35	0.2			1-3-2-3				- 0.6 - 0.6 - 0.6 - 1.6 - 1.6 - 1.6 - 2.6 - 2.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6 - 3.6
\$ H	MATERIAL DESCRIPTION  SAND, trace gravel, brown, fine grained, loose, dry, nydrocarbon odour  SAND, grey, fine grained, loose, wet, hydrocarbon odour 1.83	Ben Laird CHECKED BY GR  FER 12" WELL DIAMETER 3" GR  MATERIAL DESCRIPTION  SAND, trace gravel, brown, fine grained, loose, dry, hydrocarbon odour  SAND, grey, fine grained, loose, wet, hydrocarbon odour 1.83	GROUN  GROUN  GROUN  GROUN  MATERIAL DESCRIPTION  GROUN  MATERIAL DESCRIPTION  GROUN  MATERIAL DESCRIPTION  GROUN  GROUN  MATERIAL DESCRIPTION  GROUN  GROUN  A HER	GROUND ELE GROUND WA  TER 12" WELL DIAMETER 3" GROUND WA  MATERIAL DESCRIPTION  BAND, trace gravel, brown, fine grained, loose, dry, hydrocarbon odour  SAND, grey, fine grained, loose, wet, hydrocarbon odour 1.83	GROUND ELEVATION  Ben Laird  CHECKED BY  WELL DIAMETER 3"  MATERIAL DESCRIPTION  GROUND WATER ELE  SIMPLE 13 WELL SIMPLE 13 WAS	GROUND ELEVATION GROUND WATER LEVEL FOR 12 " WELL DIAMETER 3" GROUND WATER ELEVATION  MATERIAL DESCRIPTION  BAND, trace gravel, brown, fine grained, loose, dry, hydrocarbon odour  SAND, grey, fine grained, loose, wet, hydrocarbon odour 1.83  SAND, grey, fine grained, loose, wet, hydrocarbon odour 1.83  1-3-2-3	GROUND ELEVATION  GROUND WATER LEVEL  GROUND WATER ELEVATION  GROUND WATER ELEVATION  GROUND WATER ELEVATION  GROUND WATER ELEVATION  MATERIAL DESCRIPTION  GROUND WATER ELEVATION  JAMBUR LEVEL  WELL DIAMETER 3."  MATERIAL DESCRIPTION  JAMBUR LEVEL  WELL DIAMETER 3."  SSAND, trace gravel, brown, fine grained, loose, dry, nydrocarbon odour  1.833	SAND, trace gravel, brown, fine grained, loose, dry, hydrocarbon odour 1.83  SAND, grey, fine grained, loose, wet, hydrocarbon odour 1.83  GROUND ELEVATION GROUND WATER ELEVATION FOR COUND WATER ELEV

NOTES:

masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit

LAB ANALYSIS:

M= Metals F1 = PHC F1 | F1 = PHC F1 | F2-F4 | F2 = PHC F2-F4 | F2 = PHC F2-F4 |

V = VOC's PCB = PCB's | F2 = PHC F2-F4 |

V = VOC's PCB = PCB's | F2 = PHC F2-F4 |

V = VOC's PCB = PCB's | F2 = PHC F2-F4 |

V = VOC's PCB = PCB's |

V =

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



.OG	NO: EW-28							<b>BOREHOLE LOC</b>
AGE 1	OF 1							
	T NUMBER				/GSC			
ROJECT	F NAME Cold Lake CFB	PRO	OJE	CT LC	CATION	Cold Lal	ke, AB	<u> </u>
	G CONTRACTOR Tundra	PR	OJE	CTION	I			
	ATE _3/10/17							EASTINGTOC ELEVATION
	BY Ben Laird CHECKED BY							TOG ELEVATION
	AMETER 12" WELL DIAMETER 3"							mbgs ( )
GRAPHIC	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM
0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0	SAND, trace gravel, brown, fine grained, loose, dry  SAND, grey, fine grained, loose, wet, hydrocarbon odour 1.52							
3.2 3.4 3.6 3.8	CLAY, trace sand, grey, soft, hydrocarbon odour  3.05  End of Borehole at 3.96meters 3.96				3-5-4-6			

NOTES: LAB ANALYSIS: SAMPLE TYPE: masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit M = Metals
I = Inorganics
V = VOC's
B = BTEX
P = PAH
G = GLYCOL F1 = PHC F1 F2 = PHC F2-F4 PCB = PCB's Pes = Pesticides L/H = LEPH/HEPH VPH = VPH Split Spoon



## LOG NO: MW-7-73 **BOREHOLE LOG** PAGE 1 OF 1 **PROJECT NUMBER** \_ 702584-000 **CLIENT** PWGSC PROJECT NAME Cold Lake CFB PROJECT LOCATION Cold Lake, AB PROJECTION \_\_\_ DRILLING CONTRACTOR Core Drilling \_\_\_\_\_ EASTING \_\_\_ NORTHING \_\_\_ DRILLING METHOD Hollow Stem GROUND ELEVATION TOC ELEVATION **DRILL DATE** 9/28/16 **GROUND WATER LEVEL** <u>₹ 3.20 mbtoc ( 9/28/2016 )</u> LOGGED BY Ben Laird CHECKED BY HOLE DIAMETER 6" \_\_ WELL DIAMETER \_2 "\_\_\_ GROUND WATER ELEVATION This is the second of **BLOW COUNTS** SAMPLE TYPE ANALYSIS RECOVERY VAPOUR READINGS $\widehat{\mathbb{E}}$ Ξ GRAPHIC LOG MATERIAL DESCRIPTION WELL DIAGRAM SAMPLE NUMBER DEPTH DEPTH AB ( ORGANICS, with fine sand, trace gravel, brown, loose, dry<sub>0.05</sub> SAND, trace gravel, brown, fine grained, loose, dry 0.2 0.2 0.4 0.4 0.6 0.6 0.8 0.8 50 3-6-7 1.0 1.0 1.2 1.4 **SAND**, white, fine grained, dry, hydrocarbon odour 44 2-5-5 1.8 1.8 20 20 2.2 2.2 2.4 2.4 **SAND**, grey, fine grained, loose, wet, hydrocarbon odour 56 3-4-3 26 26 2.8 2.8 3.0 3.0 CLAY, trace fine sand, trace fine gravel, grey, soft, wet 3.2 3.2 56 3-3-4 3.4 3.6 3.6 3.8 3.8 4.0 4.0

NOTES: LAB ANALYSIS: SAMPLE TYPE: M= Metals F1 = PHC F1 I = Inorganics F2 = PHC F2-F4 V = VOC's PCB = PCR'e B = RTEV masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit Split Spoon

4 42

PCB = PCB's
Pes = Pesticides
L/H = LEPH/HEPH B = BTEX  $P = P\Delta H$ G = GLYCOL VPH = VPH

4.2

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.

End of Borehole at 4.42meters



2-4-7

LOG NO: MW-7-74						<b>BOREHOLE</b> L	OG
PAGE 1 OF 1							
PROJECT NUMBER _ 702584-000 PROJECT NAME _ Cold Lake CFB	CLIEN			Cold Lak	e, AB	i	
DRILLING CONTRACTOR Core Drilling DRILLING METHOD Hollow Stem						EASTING	
DRILL DATE _9/28/16						TOC ELEVATION	
LOGGED BY Ben Laird CHECKED BY						mbtoc ( 9/28/2016 )	
HOLE DIAMETER 6 " WELL DIAMETER 2 "	GROU	ND WA	TER ELE	VATION	<u>.</u>	mbgs ( 9/28/2016 )	
MATERIAL DESCRIPTION  (G) (G) (G) (G) (G) (G) (G) (G) (G) (G	SAMPLE NUMBER SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
ORGANICS, with fine sand, trace gravel, brown, loose, dry							-
- 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4							- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.4 - 1.5
- 1.6 SAND, white, fine grained, loose, dry, hydrocarbon odour 1.32 - 1.8 - 2.0 - 2.2		44	3-4-7				- 1.6 - 1.8 - 2.0 - 2.2
SAND, grey, fine grained, loose, dry, no odour 2.29  - 2.6						<b>Y</b>	- 2.4 - 2.6 - 2.8 - 3.0
CLAY, trace fine sand, trace fine gravel, grey, soft, wet  3.05  3.4  3.6  3.8		50	3-6-6				- 3.2 - 3.4 - 3.6 - 3.8
End of Borehole at 3.96meters 3.96		1	I		I	<u> </u>	

NOTES: LAB ANALYSIS: SAMPLE TYPE:
masl = Meters Above Sea Level M= Metals F1 = PHC F1
where = Meters Pelaw Crowd Surface L= Neuropiae F2 = PHC F2 F4

ppm = Parts Per Willion

LEL = Lower Explosive Limit

P = PAH

L/H = LEPH/IEPH

G = GLYCOL

VPH = VPH

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party.

ARCADIS accepts no liability for third party decisions/actions made based on this log.



LC	OG .	NO: MW-7-75								BOREHOLE LO	)G	
PAG	E 1 O	F 1										
PRO	JECT N	NUMBER _ 702584-000		CLIENT PWGSC								
		NAME Cold Lake CFB		PRO	OJE	CT LO	CATION	Cold Lak	ke, AB			
	PRILLING CONTRACTOR Core Drilling											
	DRILLING METHOD Hollow Stem  DRILL DATE 9/28/16									EASTINGTOC ELEVATION		
	LOGGED BY Ben Laird CHECKED BY									nbtoc ( 9/28/2016 )		
HOL	E DIAN	METER 6" WELL DIAMETER 2"		GR	OUN	D WA	TER ELE	VATION	<u>.</u>	mbgs (9/28/2016)		
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)	
-		ORGANICS, with fine sand, trace gravel, brown, loose, c SAND, trace gravel, brown, fine grained, loose, dry	dry <sub>0.05</sub> [								- 0.2	
- 0.2 - - 0.4		, trace graver, brown, fine granted, roose, dry									- 0.2 - 0.4	
- - 0.6											- - 0.6	
- 0.8					$\bigvee$	44	4-6-8				- - 0.8	
- 1.0 -					$\triangle$						_ 1.0	
- 1.2 -											- 1.2 -	
- 1.4 -											- 1.4 -	
- 1.6 -		SAND, white, fine grained, loose, dry	1.58		$\bigvee$	39	5-6-8				- 1.6 -	
- 1.8 - - 2.0					$\triangle$			_			- 1.8 - - 2.0	
- - 2.2		Wet	2.13								- - 2.2	
- 2.4		CLAY, with fine sand, trace gravel, grey, wet	2.29					-			- - 2.4	
- - 2.6						50	0-3-6				2.6	
- - 2.8 - - 3.0		CLAY, trace fine sand, trace fine gravel, grey, soft, wet	2.74		/ \						2.8 - - 3.0	
- - 3.2											- - 3.2	
- - 3.4					$\mathbb{N}$		3-4-3				- - 3.4	
- - 3.6 -											- - 3.6	
- 3.8 -											- 3.8 -	
	<u> </u>	End of Borehole at 3.96meters	3.96				ı	1		<u> </u>	1	

NOTES: LAB ANALYSIS: SAMPLE TYPE: masl = Meters Above Sea Level M= Metals F1 = PHC F1 ∑ Split Spoon

G = GLYCOL VPH = VPH

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party.

ARCADIS accepts no liability for third party decisions/actions made based on this log.



LOG NO: MW-7-76									BOREHOLE L	OG		
PAG	E 1 C	DF 1										
PRO	JECT I	NUMBER _702584-000	CLIENT PWGSC									
PRO	JECT I	NAME Cold Lake CFB	PROJECT LOCATION Cold Lake, AB									
DRIL	DRILLING CONTRACTOR Core Drilling				CTION	l						
DRIL	LING	METHOD Hollow Stem	NO	RTH	ING _				EASTING			
		TE							TOC ELEVATION			
		BY Ben Laird CHECKED BY WELL DIAMETER 2 "							mbtoc ( )			
		WELL BIAINETER 2		T			I					
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)		
-		ORGANICS, with fine sand, trace gravel, brown, loose, dry <sub>0.08</sub>							<u> </u>	-		
- 0.2 -		SAND, trace gravel, brown, fine grained, loose, dry								- 0.2		
- 0.4 -										- 0.4		
- 0.6 -										0.6		
- 0.8 -										0.8		
- 1.0 -										1.0		
- 1.2 -										1.2		
- 1.4 -				L						- 1.4		
- 1.6 -		SAND, white, fine grained, wet, weak hydrocarbon odour 1.52		$\bigvee$						- 1.6		
- 1.8 -				$\bigwedge$	50	5-6-6 6				1.8		
- 2.0 -										2.0		
- 2.2 -										2.2		
- 2.4		SAND, grey, fine grained, loose, wet, no odour 2.29								- 2.4		
- 2.6										- 2.6		
- - 2.8										2.8		
- 3.0										3.0		
- 3.2										3.2		
- - 3.4		CLAY, trace fine sand, trace fine gravel, grey, soft, wet 3.35								- 3.4		
- - 3.6										3.6		
- - 3.8										- 3.8		
-		End of Borehole at 3.96meters 3.96								<u> </u>		

NOTES: LAB ANALYSIS: SAMPLE TYPE: masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit M= Metals F1 = PHC F1 I = Inorganics F2 = PHC F2-F4 V = VOC's PCB = PCB's B = BTEX Pes = Pesticides P = PAH L/H = LEPH/HEPH G = GLYCOL VPH = VPH Split Spoon



LOG NO: MW-7-77							BOREHOLE L	OG			
PAGE 1 OF 1											
PROJECT NUMBER _702584-000											
PROJECT NAME Cold Lake CFB	PR	OJE	CT LC	CATION	Cold Lal	ke, AB					
DRILLING CONTRACTOR Core Drilling											
DRILLING METHOD Hollow Stem							EASTING				
DRILL DATE         9/29/16           LOGGED BY         Ben Laird         CHECKED BY							TOC ELEVATION				
HOLE DIAMETER 6 " WELL DIAMETER 2 "							mbgs (9/29/2016)				
(E) MATERIAL DESCRIPTION  (B) MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DЕРТН (m)			
ORGANICS, with fine sand, trace gravel, brown, loose					, –			+			
SAND, trace gravel, brown, fine grained, loose, dry  O.4  O.6  O.8  O.7  O.8  O.8  O.8  O.9  O.9  O.9  O.9  O.9	1.98 2.13 t 2.74		50	3-3-4				- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8 - 2.0 - 2.2 - 2.4 - 2.6 - 3.0 - 3.2 - 3.4 - 3.6 - 3.8			

NOTES:

M= Meters Above Sea Level
mbgs = Meters Below Ground Surface

M= Metals
I = Inorganics
F2 = PHC F1
F2 SAMPLE TYPE:

SAMPLE TYPE:

Split Spoon



LOG NO: MW-7-78									<b>BOREHOLE LOG</b>						
PAGE	1 0	F 1													
PROJ	ECT I	NUMBER 702584-000	CLIENT PWGSC												
PROJ	ECT I	NAME Cold Lake CFB	PROJECT LOCATION Cold Lake, AB												
DRILL	RILLING CONTRACTOR Core Drilling														
	RILLING METHOD Hollow Stem								EASTING						
	RILL DATE         9/29/16           OGGED BY         Ben Laird         CHECKED BY								TOC ELEVATION						
HOLE DIAMETER 6" WELL DIAMETER 2"															
DЕРТН (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM (E) HE						
		ORGANICS, with fine sand, trace gravel, brown, loose, dry													
- 0.2 - 0.4 - 0.6		SAND, trace gravel, brown, fine grained, loose, dry							- 0 - 0 - 0						
- 0.8 - 1.0 - 1.2					39	5-5-7			- 0 - 1.						
- 1.4 - 1.6 - 1.8		SAND, white, fine grained, dry, hydrocarbon odour  1.52  Wet  1.83			11	4-5-6			- 1						
- 2.0 - 2.2 - 2.4									- 2 - 2 - 2 - 2						
- 2.6 - 2.8		CLAY, trace fine sand, trace fine gravel, grey, soft, wet 2.49		$\bigwedge$	72	0-1-1			- 2						
- 3.0 - 3.2 - 3.4					78	3-3-3			3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -						
- 3.6 - 3.8		End of Borehole at 3.96meters 3.96							- 3 - 3						

NOTES: LAB ANALYSIS: SAMPLE TYPE:
masl = Meters Above Sea Level M= Metals F1 = PHC F1
where = Meters Pelaw Crowd Surface L= Neuropiae F2 = PHC F2 F4

G = GLYCOL VPH = VPH

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party.

ARCADIS accepts no liability for third party decisions/actions made based on this log.



LC	LOG NO: MW-7-79								BOREHOLE LC	)G		
PAG	E 1 O	F 1										
RO	JECT N	NUMBER 702584-000	CLIENT PWGSC									
RO	JECT N	NAME Cold Lake CFB	PRO ITOT I CONTION ON IN A P									
RIL	RILLING CONTRACTOR Core Drilling				CTION	I						
	RILLING METHOD Hollow Stem				ing _				EASTING			
	RILL DATE         9/29/16           DGGED BY         Ben Laird         CHECKED BY								TOC ELEVATION			
		METER _6 " WELL DIAMETER _2 "							mbgs ( )			
				T					I	$\overline{\top}$		
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)		
		ORGANICS, with fine sand, trace gravel, brown, loose, dry	0) 2	107					03 03	╁		
0.2		SAND, white, fine grained, dry								0.:		
0.4										0.		
0.6				X	39	5-5-5				0.0		
0.8										0.8		
1.0										_ 1.0		
1.2										_ 1.:		
1.4										1.		
1.6										- 1.0		
1.8				X.	44	4-3-3				- 1.8		
2.0										_ 2.		
2.2				17						_ 2.		
2.4				X.	44	3-2-3				2.		
2.6										- 2.0		
2.8										- 2.8		
3.0										- 3.0		
3.2				$\mathbb{N}$	64	444				- 3.:		
3.4		CLAY, trace fine sand, trace fine gravel, grey, soft, wet 3.35		$\mathbb{N}$	61	4-1-1				- 3.4		
3.6										- 3.		
3.8										- 3.		
		End of Borehole at 3.96meters 3.96										

NOTES:

masl = Meters Above Sea Level
mbgs = Meters Below Ground Surface
toc = Top of Casing
ppm = Parts Per Million
LEL = Lower Explosive Limit

LAB ANALYSIS:

M = Metals
F1 = PHC F1
I = PHC F1
V = VOC's
PCB = PCB's
PCB = PCB's
B = BTEX
Pes = Pesticides
P = PAH
L/H = LEPH/HEPH
G = GLYCOL
VPH = VPH

SAMPLE TYPE:

Split Spoon

Split Spoon

Split Spoon

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L	)G	NO: MW-7-80							BOREHOLE L	OG
PAG	E 1 C	DF 1								
PRO	JECT I	NUMBER 702584-000	CLI	ENT	PW	/GSC				
PRO	JECT I	NAME Cold Lake CFB	PRO	OJE	CT LC	CATION	Cold La	ke, Al	3	
DRIL	LING (	CONTRACTOR Core Drilling	PRO	)JE	CTION	1				
		METHOD Hollow Stem							EASTING	
		<b>E</b> _29/9/16							TOC ELEVATION	
		Y Ben Laird CHECKED BY							mbtoc ( 28/09/2016 )	
HOL	E DIAN	METER _6 " WELL DIAMETER _2 "	GR	OUN	ID WA	TER ELE	VATION	<del></del> .	mbgs (28/09/2016)	
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEPTH (m)
		ORGANICS, with fine sand, trace gravel, brown, loose, dry 5								-
- 0.2		SAND, trace gravel, brown, fine grained, loose, dry								- 0.2
- 0.4										- 0.4
- 0.6										- 0.6 -
- 0.8										0.8
- 1.0										1.0
- 1.2										_ 1.2
- 1.4										- 1.4
- 1.6		SAND, white, fine grained, dry, hydrocarbon odour 1.52								- 1.6
- - 1.8										1.8
- 2.0										- - 2.0
- 2.2										- - 2.2
- 2.4		Wet 2.29								- - 2.4
- 2.6		SAND, grey, fine grained, loose, wet, hydrocarbon odou <sup>2.44</sup>								- - 2.6
- 2.8										- 2.8
										+
- 3.0 ·		CLAY, trace fine sand, trace fine gravel, grey, soft, wet 3.05								3.0
- 3.2 ·										- 3.2 -
- 3.4 ·										<del>-</del> 3.4
- 3.6										- 3.6 -
- 3.8										- 3.8 -
	<u> </u>	End of Borehole at 3.96meters 3.96		1		1	1		To GetPa Get	

masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit P = PAH L/H = LEPH/HEPH G = GLYCOL PH = VPH

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. ARCADIS accepts no liability for third party decisions/actions made based on this log.



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LOG NO: MW-7-81									BOREHOLE LO	OG		
PAGE 1 (	OF 1											
	NUMBER _ 702584-000		CLIENT PWGSC									
PROJECT	NAME Cold Lake CFB		PRO	OJE	CT LC	CATION	Cold La	ke, AB	<u> </u>			
DRILLING	CONTRACTOR Core Drilling											
	METHOD Hollow Stem								EASTING			
	TE 9/28/16								TOC ELEVATION			
	BY         Ben Laird         CHECKED BY           METER         6 "         WELL DIAMETER         2 "								mbtoc ( 9/28/2016 ) mbgs ( 9/28/2016 )			
TIOLE DIA	WELL DIAMETER 2		GIC		U 117		VATION	<del></del> .	Thogs ( 9/20/2010 )			
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE NUMBER	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DEРТН (m)		
-	ORGANICS, with fine sand, trace gravel, brown, loose, c	dry0.03								+		
- 0.2	SAND, trace gravel, brown, fine grained, loose, dry									0.2		
- 0.4										- 0.4		
- 0.6										0.6		
- 0.8										0.8		
- 1.0										_ 1.0		
- 1.2										1.2		
- 1.4										1.4		
- 1.6	SAND, white, fine grained, loose, dry	1.52		7			-			1.6		
- - 1.8				IX.	44	4-5-7				1.8		
- - 2.0							-			2.0		
- - 2.2	: : : : : : :	2.13								- 2.2		
- 2.4										- 2.4		
- 2.6										2.6		
										-		
- 2.8	CLAY, trace fine sand, trace fine gravel, grey, soft, wet	2.90								<u> </u>		
- 3.0 -	JEAT, trace line sand, trace line gravel, grey, sort, wet									3.0		
- 3.2					50	3-4-5				3.2		
- 3.4										- 3.4		
- 3.6										3.6		
- 3.8										3.8		
<u> </u>	End of Borehole at 3.96meters	3.96					<u> </u>					



LOG NO: MW-7-82							BOREHOLE L	OG		
PAGE 1 OF 1										
PROJECT NUMBER 702584-000	CL	CLIENT PWGSC								
PROJECT NAME Cold Lake CFB	PR	OJE	CT LO	CATION	Cold Lal	ke, AB				
DRILLING CONTRACTOR Core Drilling										
DRILLING METHOD Hollow Stem							EASTING			
DRILL DATE 9/29/16  LOGGED BY Ben Laird CHECKED BY							TOC ELEVATION nbtoc ( 9/29/2016 )			
HOLE DIAMETER 6 " WELL DIAMETER 2 "							mbgs (9/29/2016)			
(m) MATERIAL DESCRIPTION	SAMPLE	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	VAPOUR READINGS	LAB ANALYSIS	WELL DIAGRAM	DЕРТН (m)		
ORGANICS, with fine sand, trace gravel, brown, loose, dry	9 7	0,		ш	7 =			+		
- 0.2 SAND, trace gravel, brown, fine grained, loose, dry - 0.4 0.6 0.8 1.0 1.2 1.4 1.6 SAND, white, fine grained, dry, hydrocarbon odour - 1.5 - 1.8	2		44	3				- 0.2 - 0.4 - 0.6 - 0.8 - 1.0 - 1.2 - 1.4 - 1.6 - 1.8		
- 2.0 - 2.2 Wet 2.1 - 2.4 - 2.6 - 2.8	3						•	- 2.0 - 2.2 - 2.4 - 2.6 - 2.8		
CLAY, trace fine sand, trace fine gravel, grey, soft, wet  3.0  3.1  3.4  3.6  3.8  3.8	5		67	4-3-3				- 3.0 - 3.2 - 3.4 - 3.6 - 3.8		
End of Borehole at 3.96meters 3.9	6				1		j Parket Parket			

NOTES: LAB ANALYSIS: SAMPLE TYPE: Split Spoon

masl = Meters Above Sea Level mbgs = Meters Below Ground Surface toc = Top of Casing ppm = Parts Per Million LEL = Lower Explosive Limit M= Metals F1 = PHC F1 I = Inorganics F2 = PHC F2-F4 V = VOC's PCB = PCB's B = BTEX Pes = Pesticides P = PAH L/H = LEPH/HEPH G = GLYCOL VPH = VPH

