

ATTACHMENT 1
Borehole Logs

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (B) 1380 Gully Bottom
N: 6710201.57 E: 506634.72

DRILLING DATE: July 16, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION															
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			20	40	60	80	20	40	60	80	WATER CONTENT PERCENT						
				1198.97														Wp	WI								
0	Foremost DR12 Air Rotary	Ground Surface		0.00																					Concrete		
		FILL - (SW-GW) SAND and GRAVEL, trace to some silt; brown; non-cohesive, moist, compact.			SA1																						
1						SA2																					
2						SA3																					
3						SA4																					
4						SA5																					
5						SA6																					
6						SA7																					
7																											
8																											
9																											
10																											
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MW13-01

Concrete

Grout

File: GINT_GAL_NATIONAL\IM_Output\Forms\BC_BOREHOLE (EN\IRO) Template\LOCAL\HOST\GINT_GAL_TEMPLATE_DEV.Library\GAL_LIBRARY\GLB_RY\James_4/2/14


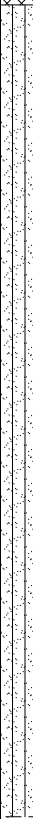
PROJECT No.: 12-1021-0006 / 6000

RECORD OF BOREHOLE: BH13-01

SHEET 2 OF 3
 DATUM: NAD 83

CLIENT: Teck Metals
 PROJECT: Sa Dena Hes Mine
 LOCATION: (B) 1380 Gully Bottom
 N: 6710201.57 E: 506634.72

DRILLING DATE: July 16, 2013
 DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER TYPE	BLOWS/0.3m	CORE No. CORE RECOVERY %		20 40 60 80	20 40 60 80			Wp --- W --- Wi
10		FILL - (SW-GW) SAND and GRAVEL, trace to some silt; brown; non-cohesive, moist, compact. (continued)		1184.34	SA8							MW13-01	
11				14.63	SA9								
12		(SM) SILTY SAND, some gravel, fine to medium; grey; non-cohesive, moist, compact.			SA10							Grout	
13					SA11								
14					SA12								
15	Foremost DR12 Air Rotary				SA13								
16													
17					SA14								
18													
19											Hydrated Bentonite Chips/Pellets		
20											Silica Sand		

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DEPTH SCALE

1 : 50



LOGGED: AB

CHECKED: TR

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (B) 1380 Gully Bottom
N: 6710201.57 E: 506634.72

DRILLING DATE: July 16, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			WATER CONTENT PERCENT	
													Wp	Wi
20	Foremost DR12 Air Rotary	(SM) SILTY SAND, some gravel, fine to medium; grey; non-cohesive, moist, compact. (continued)										MW13-01		
21														
22														
23														
24														
25		BEDROCK; grey with black and white flecks.		1173.98 24.99										
26														
27														
28		End of Borehole.		1171.54 27.43										
29														
30														

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (M) Jewel Box Mid
N: 6709617.73 E: 507059.91

DRILLING DATE: July 18, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS/0.3m	CORE No.		CORE RECOVERY %	20		
0	Foremost DR12 Air Rotary	Ground Surface	1303.73									Concrete
		(SW) SAND, fine to coarse, some gravel; grey; non-cohesive, moist, compact.	0.00	SA1								
1												
		BEDROCK; grey.	1302.21	1.52	SA2							
2												
3												
4				SA3							Grout	
5												
6				SA4								
7												
8				SA5								
9												
10				SA6								
CONTINUED NEXT PAGE												

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (M) Jewel Box Mid
N: 6709617.73 E: 507059.91

DRILLING DATE: July 18, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES					PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION				
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.		CORE RECOVERY %	WATER CONTENT PERCENT						
									Wp		Wi						
10	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)											MW13-02				
11				SA7	⊕												
12				SA8	⊕												
13				SA9	⊕												
14																	
15				SA10	⊕												
16																	
17				SA11	⊕												
18				SA12	⊕												
19																	
20				SA13	⊕												
						Grout											
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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (M) Jewel Box Mid
N: 6709617.73 E: 507059.91

DRILLING DATE: July 18, 2013
DRILLING CONTRACTOR: Impact Drilling


DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES					PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.		CORE RECOVERY %	WATER CONTENT PERCENT					
											Wp	W	WI			
20	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)													Grout	
21				SA14												
22																
23				SA15												
24																
25				SA16												
26																
27				SA17												
28																
29				SA18												
30																
30			SA19													
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RECORD OF BOREHOLE: BH13-02

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (M) Jewel Box Mid
N: 6709617.73 E: 507059.91

DRILLING DATE: July 18, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION						
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT									
									20	40	60	80	Wp	W	WI					
30	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)																		
31																				
32																				
33																				
34																				
35																				Grout
36																				
37																				
38																				
39																				
40																				


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RECORD OF BOREHOLE: BH13-02

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (M) Jewel Box Mid
N: 6709617.73 E: 507059.91

DRILLING DATE: July 18, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION				
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	PID ppm	WATER CONTENT PERCENT							
											Wp	W			WI			
40	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)																
41				SA27														
42																		
43					SA28													
44					SA29													
45																		
46					SA30													
47					SA31													
48																		
49					SA32													
50		CONTINUED NEXT PAGE																

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RECORD OF BOREHOLE: BH13-02

CLIENT: Teck Metals
 PROJECT: Sa Dena Hes Mine
 LOCATION: (M) Jewel Box Mid
 N: 6709617.73 E: 507059.91

DRILLING DATE: July 18, 2013
 DRILLING CONTRACTOR: Impact Drilling


DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION							
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	20	40			60	80	20	40	60	80	
	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)			SA33													Grout Hydrated Bentonite Chips/Pellets Silica Sand		
50																				
51																				
52							SA34													
53							SA35													
54							SA36													
55							SA37													
56							SA38													
57							SA39													
58																				
59																				
60																				
		CONTINUED NEXT PAGE																		

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (M) Jewel Box Mid
N: 6709617.73 E: 507059.91

DRILLING DATE: July 18, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp — W — Wi	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m						CORE No.	CORE RECOVERY %
60	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)										Screen		
61					SA40									Silica Sand
62					SA41									
63					SA42									
64		End of Borehole.		1239.72 64.01										
65														
66														
67														
68														
69														
70														

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RECORD OF BOREHOLE: BH13-03

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (C) Jewel Box Top
N: 6709335.18 E: 506737.38

DRILLING DATE: July 19, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION					
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT								
											Wp	W			WI				
0	Foremost DR12 Air Rotary	Ground Surface	1408.29	0.00															
		(SW) gravelly SAND, fine to coarse; brown; non-cohesive, moist, compact.			SA1														Concrete
1					SA2														
2																			
3				1405.24	3.05	SA3													
			BEDROCK; grey.																
4						SA4													
5																		Grout	
6					SA5														
7																			
8					SA6 SA7														
9																			
10																			

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (C) Jewel Box Top
N: 6709335.18 E: 506737.38


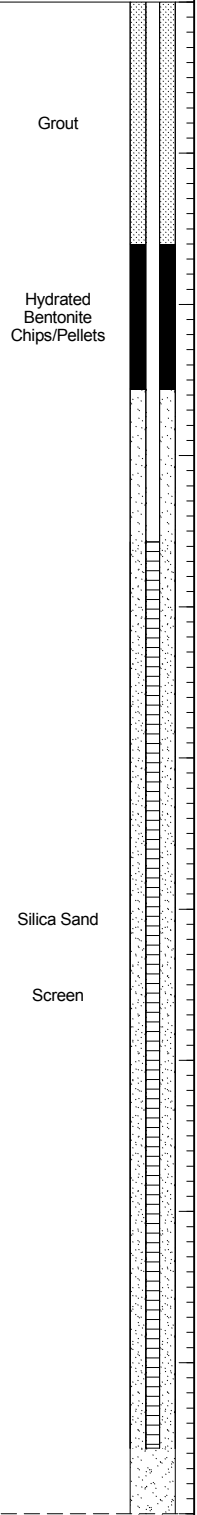
DRILLING DATE: July 19, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m			CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT					
												Wp	W			WI	W
10		BEDROCK; grey. (continued)															
11																	
12					SA8												
13																	
14					SA9												
15	Foremost DR12 Air Rotary													Grout			
16																	
17					SA10												
18																	
19					SA11												
20																	
21					SA12												
22																	
23					SA13												
24																	
25					SA14												
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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (C) Jewel Box Top
N: 6709335.18 E: 506737.38

DRILLING DATE: July 19, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION MW13-03	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m			CORE No. CORE RECOVERY %	Wp			WI
20	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)												
21				SA15										
22					SA16									
23														
24					SA17									
25														
26					SA18									
27														
28					SA19									
29														
30			SA20											
		CONTINUED NEXT PAGE												

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (C) Jewel Box Top
N: 6709335.18 E: 506737.38

DRILLING DATE: July 19, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m					
30	Air Rotary	BEDROCK; grey. (continued)		1377.81	SA21							
		End of Borehole.		30.48								
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												

MW13-03

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (E) Main Road Background
N: 6708728.81 E: 507239.71

DRILLING DATE: July 20, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m						CORE No.	CORE RECOVERY %
0	Foremost DR12 Air Rotary	Ground Surface		1199.51								Concrete		
		FILL - (SW-GW) SAND and GRAVEL, fine to medium; brown; non-cohesive, moist, compact.		0.00	SA1									
1					SA2									
2														
3					SA3									
4					SA4									
5														
6				SA5										
7														
8		(SM) SILTY SAND, some gravel; grey brown; non-cohesive, moist, compact.		1191.89 7.62	SA6							Grout		
9					SA7									
10														

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (E) Main Road Background
N: 6708728.81 E: 507239.71

DRILLING DATE: July 20, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			20	40	60
10	Foremost DR12 Air Rotary	(SM) SILTY SAND, some gravel; grey brown; non-cohesive, moist, compact. (continued)													
						SA8									
11															
						SA9									
12															
						SA10									
13															
						SA11									
14															
						SA12									
15					BEDROCK; black.										
						SA13									
16															
17															
18															
19															
20															

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MW13-04

Grout



Hydrated Bentonite Chips/Pellets

Silica Sand

Screen

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (E) Main Road Background
N: 6708728.81 E: 507239.71

DRILLING DATE: July 20, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m					
20	Foremost DR12 Air Rotary	BEDROCK; black. (continued)										Silica Sand 
21												
		End of Borehole.		1178.17 21.34								
22												
23												
24												
25												
26												
27												
28												
29												
30												

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (D) Main Gate
N: 6709391.55 E: 507318.33

DRILLING DATE: July 21, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m						CORE No.	CORE RECOVERY %
0	Foremost DR12 Air Rotary	Ground Surface		1195.16								Concrete Grout Hydrated Bentonite Chips/Pellets Silica Sand Screen		
		FILL - (SW-GW) SAND and GRAVEL; brown, non-cohesive, moist, compact.	[Cross-hatched pattern]	0.00	SA1									
1														
		(SM) SILTY SAND, some gravel; brown, non-cohesive, moist, compact.	[Dotted pattern]	1.52	SA2									
2														
3					SA3									
4		Boulder from 3.66 m to 4.27 m.			SA4									
5					SA5									
5		End of Borehole.		1189.98										
				5.18										
6														
7														
8														
9														
10														

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PROJECT No.: 12-1021-0006 / 6000

RECORD OF BOREHOLE: BH13-06

SHEET 1 OF 5
DATUM: NAD 83

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (L) Burnick
N: 6713001.24 E: 506761.33

DRILLING DATE: July 21, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			WATER CONTENT PERCENT
0	Foremost DR12 Air Rotary	Ground Surface		1210.04								Concrete	
		FILL - (SW-GW) SAND and GRAVEL; black; non-cohesive, moist, loose.		0.00	SA1								
1						SA2							
2													
3													
4													
5													
		(SM) SILTY SAND, trace wood debris; grey, non-cohesive, moist, compact.		1205.47								Grout	
			4.57	SA4									
6													
7													
8													
9													
10													

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DEPTH SCALE
1 : 50



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PROJECT No.: 12-1021-0006 / 6000

RECORD OF BOREHOLE: BH13-06

SHEET 2 OF 5
DATUM: NAD 83

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (L) Burnick
N: 6713001.24 E: 506761.33

DRILLING DATE: July 21, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m						CORE No.	CORE RECOVERY %	
								20	40	60					80
10	Foremost DR12 Air Rotary	BEDROCK; black.	[Hatched pattern]	1199.68	SA8							MW13-06			
10.36															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

Grout

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DEPTH SCALE


1 : 50



LOGGED: AB
CHECKED: TR

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (L) Burnick
N: 6713001.24 E: 506761.33

DRILLING DATE: July 21, 2013
DRILLING CONTRACTOR: Impact Drilling


DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES					PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.		CORE RECOVERY %	20			40	60	80
20	Foremost DR12 Air Rotary	BEDROCK; black. (continued)												MW13-06		
21																
22							SA15									
23							SA16									
24																
25							SA17									
26							SA18									
27																
28							SA19									
29							SA20									
30																
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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (L) Burnick
N: 6713001.24 E: 506761.33

DRILLING DATE: July 21, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION					
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT								
											Wp	W			WI				
30	Foremost DR12 Air Rotary	BEDROCK; black. (continued)																	
31																			
32																			
33																			
34																			
35																			
36																			
37																			
38																			
39																			
40																			
		CONTINUED NEXT PAGE																	

MW13-06

Grout

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (L) Burnick
N: 6713001.24 E: 506761.33

DRILLING DATE: July 21, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			20	40	60
40	Foremost DR12 Air Rotary	BEDROCK; black. (continued)											MW13-06		
41															
42							SA28								
43							SA29								
44							SA30								
45															
46							SA31								
47							SA32								
48							SA33								
49					End of Borehole.										
50															

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (K) North Dam
N: 6711502.08 E: 507903.55

DRILLING DATE: July 22, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.					
0	Foremost DR12 Air Rotary	Ground Surface (SM) SILTY SAND , some gravel; grey brown; non-cohesive, moist to wet, compact.	1097.70 0.00	SA1								Concrete
1				SA2								
2					SA3							
3			BEDROCK; grey.	1094.65 3.05	SA4							Grout
4					SA5							
5					SA6							
6					SA7							
7												
8												
9												
10												

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (K) North Dam
N: 6711502.08 E: 507903.55

DRILLING DATE: July 22, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES					PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.		CORE RECOVERY %	WATER CONTENT PERCENT					
											Wp	W	WI			WU
10	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)													Grout	
11			SA8													
12			SA9													
13																
14			SA10													
15			SA11													
16																
17			SA12													
18																
19			SA13													
20			SA14													
			CONTINUED NEXT PAGE													

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (K) North Dam
N: 6711502.08 E: 507903.55

DRILLING DATE: July 22, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION MW13-07		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m						CORE No.	CORE RECOVERY %
20	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)		SA14										
21														
22				SA15										
23				SA16										
24				SA17										
25				SA18										
26				SA19										
27														
28														
29				SA20										
30	CONTINUED NEXT PAGE													

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (K) North Dam
N: 6711502.08 E: 507903.55

DRILLING DATE: July 22, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ○ Wl	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m					
30	Foremost DR12 Air Rotary		BEDROCK; grey. (continued)									
31					SA21				⊕			
32					SA22				⊕			
33				SA23			⊕					
		1064.17 33.53		End of Borehole.								
34												
35												
36												
37												
38												
39												
40												

MW13-07

Silica Sand
Screen

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (H) Camp Creek
N: 6710233.90 E: 507324.77

DRILLING DATE: July 23, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm				DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT								
										Wp		Wi						
0	Foremost DR12 Air Rotary	Ground Surface	[Cross-hatched pattern]	1141.27												Concrete		
		FILL - (SW-GW) SAND and GRAVEL, fine to coarse; brown; non-cohesive, moist, compact.		0.00	SA1													
1																		
2																		
3			(SM) SILTY SAND, some gravel; brown, non-cohesive, moist, compact.	[Dotted pattern]	1138.83												Grout	
			2.44		SA3													
4																		
5																		
6																		
7																		
8																Hydrated Bentonite Chips/Pellets		
9																Silica Sand		
10																		

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (H) Camp Creek
N: 6710233.90 E: 507324.77

DRILLING DATE: July 23, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.		CORE RECOVERY %	WATER CONTENT PERCENT						
									Wp		W	Wl					
											10	20	30	40			
10	Foremost DR12 Air Rotary	<p>(SM) SILTY SAND, some gravel; brown, non-cohesive, moist, compact. <i>(continued)</i></p>														Screen Silica Sand	
11				SA8													
12				SA9													
		End of Borehole.		1129.08	12.19												
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

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RECORD OF BOREHOLE: BH13-09

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (G) Towards Reclaim Dam
N: 6709877.64 E: 508205.91

DRILLING DATE: July 23, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT						
											Wp	W			WI	W	
0	Foremost DR12 Air Rotary	Ground Surface		1090.24											Concrete		
		FILL - (SW-GW) SAND and GRAVEL, fine to coarse; grey; non-cohesive, moist, compact.		0.00	SA1												
1																	
2						SA2											
3																	
4			(SM) SILTY SAND, trace to some gravel; brown; non-cohesive, moist, compact.		1086.89	SA3											Grout
					3.35												
5					SA4												
6					SA5												
7																	
8					SA6												
9															Hydrated Bentonite Chips/Pellets		
					SA7												
10															Silica Sand		

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (G) Towards Reclaim Dam
N: 6709877.64 E: 508205.91

DRILLING DATE: July 23, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	20	40			60
10	Foremost DR12 Air Rotary	(SM) SILTY SAND, trace to some gravel; brown; non-cohesive, moist, compact. <i>(continued)</i>												MW13-10	
11				- Water at 10.97 m.	SA8										
12					SA9										
13					SA10										
14					SA11										
14.33		End of Borehole.		1075.91											
15															
16															
17															
18															
19															
20															

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (F) Reclaim Dam
N: 6709865.85 E: 507774.32

DRILLING DATE: July 24, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT				
0	Foremost DR12 Air Rotary	Ground Surface		1124.35											Concrete
		FILL - (SW-GW) SAND and GRAVEL, fine to coarse; brown; non-cohesive, moist, compact.		0.00	SA1										
1															
			(SM) SILTY SAND, trace to some gravel; brown; non-cohesive, moist, compact.		1122.83										Grout
				1.52	SA2										
2															
3						SA3									
4					SA4										
5															
6					SA5										
7															Hydrated Bentonite Chips/Pellets
					SA6										
8															Silica Sand
					SA7										
9		- Water at 9.14 m.													Screen
10															

MW13-09

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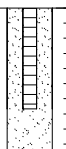
CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (F) Reclaim Dam
N: 6709865.85 E: 507774.32

DRILLING DATE: July 24, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE				SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %		WATER CONTENT PERCENT								
											Wp	W	WI						
10	Foremost DRI2 Air Rotary	(SM) SILTY SAND, trace to some gravel; brown; non-cohesive, moist, compact. (continued)		1113.38															
11		End of Borehole.		10.97															
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			

MW13-09

Silica Sand



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PROJECT No.: 12-1021-0006 / 6000

RECORD OF BOREHOLE: BH13-11

SHEET 1 OF 4
DATUM: NAD 83

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (I) South Background
N: 6709903.19 E: 508506.69

DRILLING DATE: July 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m					CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT
0	Foremost DR12 Air Rotary	Ground Surface	1080.55	0.00							Concrete			
		(SM) SILTY SAND, trace to some gravel; brown; non-cohesive, moist, compact.		SA1										
1				SA2										
2					SA3									
3					SA4									
4					SA5									
5					SA6									
6		BEDROCK; grey.	1075.06	5.49							Grout			
				SA7										
7														
8														
9														
10														

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DEPTH SCALE

1 : 50



LOGGED: AB

CHECKED: TR

RECORD OF BOREHOLE: BH13-11

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (I) South Background
N: 6709903.19 E: 508506.69

DRILLING DATE: July 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m			CORE No.	CORE RECOVERY %	Wp				Wi	
												20	40			60	80
10	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)															
11				SA8													
12				SA9													
13																	
14				SA10													
15				SA11													
16																	
17				SA12													
18				SA13													
19																	
20				SA14													
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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (I) South Background
N: 6709903.19 E: 508506.69

DRILLING DATE: July 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m					
20	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)										MW13-11 Grout Hydrated Bentonite Chips/Pellets Silica Sand Screen
21				SA15								
22					SA16							
23												
24					SA17							
25												
26					SA18							
27												
28					SA19							
29						SA20						
30		CONTINUED NEXT PAGE										

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (I) South Background
N: 6709903.19 E: 508506.69

DRILLING DATE: July 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			20	40	60
30	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)											MW13-11 Silica Sand Screen		
31															
32															
33															
34		End of Borehole.		1046.41 34.14											
35															
36															
37															
38															
39															
40															

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (J) East of Tailings
N: 6711071.61 E: 508239.90

DRILLING DATE: July 26, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m						CORE No.
0	Foremost DR12 Air Rotary	Ground Surface	[Pattern]	1127.56								Concrete	
		(SP) SAND, coarse, some gravel, organics; brown; non-cohesive, wet, loose.		0.00	SA1								
1													
			(SM) SILTY SAND; brown; non-cohesive, moist, compact.	1126.04									
2				1.52	SA2								
3													
			BEDROCK; grey.	1123.90									
4			3.66	SA3									
5				SA4									
6				SA5									
7				SA6								Hydrated Bentonite Chips/Pellets	
8				SA7									
9												Silica Sand	
10													

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: (J) East of Tailings
N: 6711071.61 E: 508239.90

DRILLING DATE: July 26, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT					
									Wp	W	WI					
10	Foremost DR12 Air Rotary	BEDROCK; grey. (continued)												MW13-12 Screen Silica Sand 		
11				SA8												
12				SA9												
13																
14				SA10												
15																
16				SA11												
17																
17					End of Borehole.											
18																
19																
20																

File: GINT_GAL_NATIONAL\IM_Output\Forms\BC_BOREHOLE (EN\IRO) Template\LOCALHOST\GINT_GAL_TEMPLATE_DEV_Library\GAL_LIBRARY\GLB_RY\James_4/2/14

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: Golden Hill Shop
N: 6709928.62 E: 507296.44

DRILLING DATE: Sept 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION												
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			20	40	60	80								
0	Foremost DR12 Air Rotary	Ground Surface		1207.34																				
		FILL - (SW-GW) SAND and GRAVEL, fine to medium sand, fine subangular to angular gravel, some silt, trace wood debris to 1.52 m; brown, some dark grey staining at surface, slight PHC odour; cohesive, moist, compact.		0.00	SA1				⊕															
1						SA2			⊕															
2																								Casing
3			BEDROCK, weathered to 3.35 m, subangular fine to coarse fragments, some silty sand; light grey; non-cohesive, dense. - Competent lense from 3.35 m to 3.51 m.		1204.30 3.05	SA3			⊕															
4			- Weathered from 4.27 m to 4.57 m.			SA4			⊕															
5																								
6					SA5			⊕																
7																								
8					SA6			⊕																
9					SA7			⊕																
10																								
																							Open Hole	

CONTINUED NEXT PAGE

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: Golden Hill Shop
N: 6709928.62 E: 507296.44

DRILLING DATE: Sept 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION									
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %			20	40	60	80					
10	Foremost DR12 Air Rotary	BEDROCK, weathered to 3.35 m, subangular fine to coarse fragments, some silty sand; light grey; non-cohesive, dense. (continued)																			
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					
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Open Hole

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RECORD OF BOREHOLE: TH13-14

CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: Golden Hill Shop
N: 6709928.62 E: 507296.44

DRILLING DATE: Sept 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE				SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION					
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %		20 40 60 80						Wp	W		Wi	
											10 20 30 40							10 20			
																		10 20			
20		BEDROCK, weathered to 3.35 m, subangular fine to coarse fragments, some silty sand; light grey; non-cohesive, dense. (continued)																			
21					SA15		⊕														
22																					
23						SA16		⊕													
24						SA17		⊕													
25	Foremost DR12 Air Rotary																		Open Hole		
26				SA18		⊕															
27																					
28				SA19		⊕															
29				SA20		⊕															
30		CONTINUED NEXT PAGE																			

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CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: Golden Hill Shop
N: 6709928.62 E: 507296.44

DRILLING DATE: Sept 25, 2013
DRILLING CONTRACTOR: Impact Drilling

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	WATER CONTENT PERCENT Wp ----- W ----- WI 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m						CORE No.	CORE RECOVERY %
30	Foremost DR12 Air Rotary	BEDROCK, weathered to 3.35 m, subangular fine to coarse fragments, some silty sand; light grey; non-cohesive, dense. (continued)												
31				SA21										
32				SA22										
33				SA23										
34				SA24										
35				SA25										
36				SA26										
37														
38														
39														
40														
												Open Hole		

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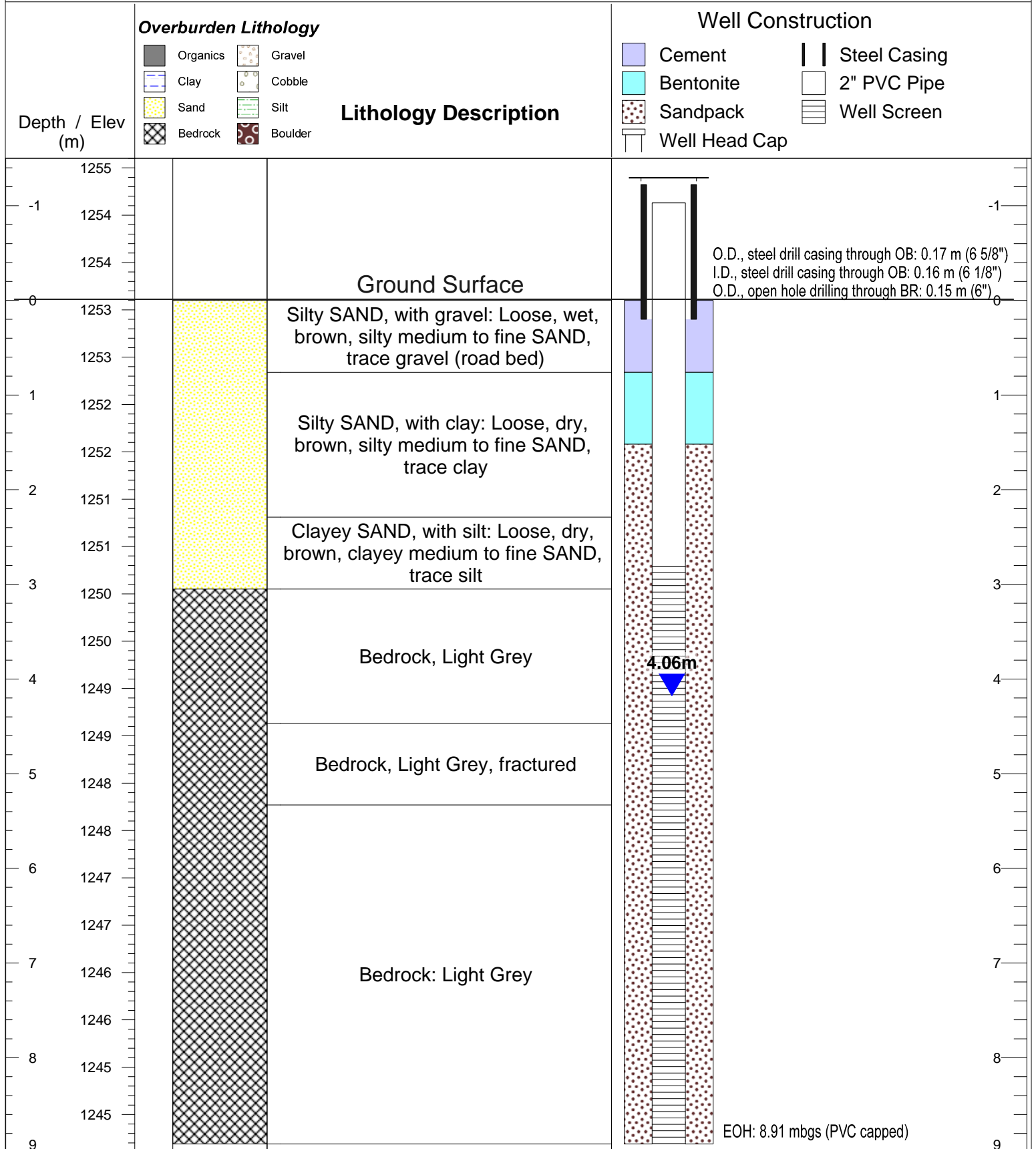
CLIENT: Teck Metals
PROJECT: Sa Dena Hes Mine
LOCATION: Golden Hill Shop
N: 6709928.62 E: 507296.44

DRILLING DATE: Sept 25, 2013
DRILLING CONTRACTOR: Impact Drilling

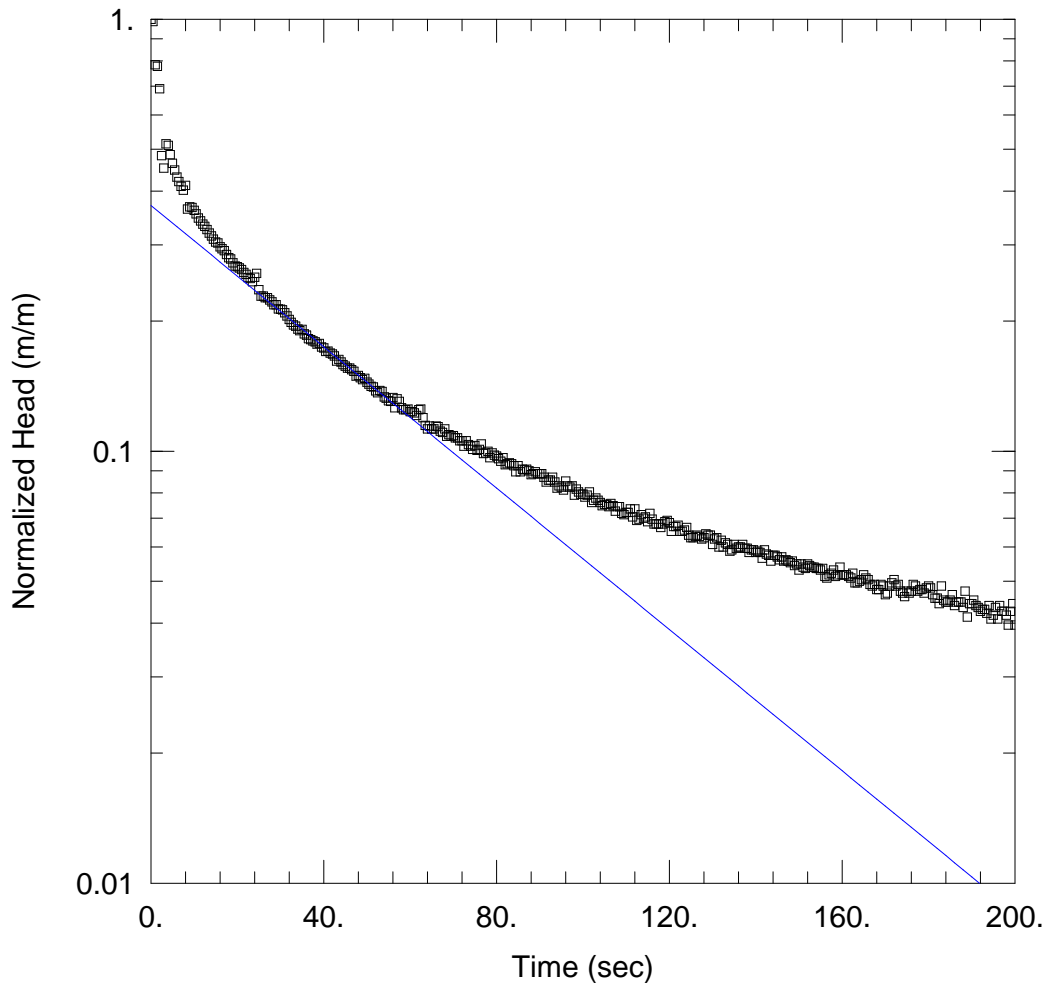
DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PID ppm	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m		CORE No.	CORE RECOVERY %	WATER CONTENT PERCENT						
											Wp	W			WI		
40	Foremost DRI12 Air Rotary	BEDROCK, weathered to 3.35 m, subangular fine to coarse fragments, some silty sand; light grey; non-cohesive, dense. (continued)															
41					SA28												
42																	
43																	
44																	
45																	
46		End of Borehole.		1161.62 45.72													
47																	
48																	
49																	
50																	

Open Hole

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ATTACHMENT 2
Groundwater Response Testing Results



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-04 RH1.aqt
 Date: 03/21/14 Time: 12:22:36

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-04
 Test Date: Aug 27, 2013

AQUIFER DATA

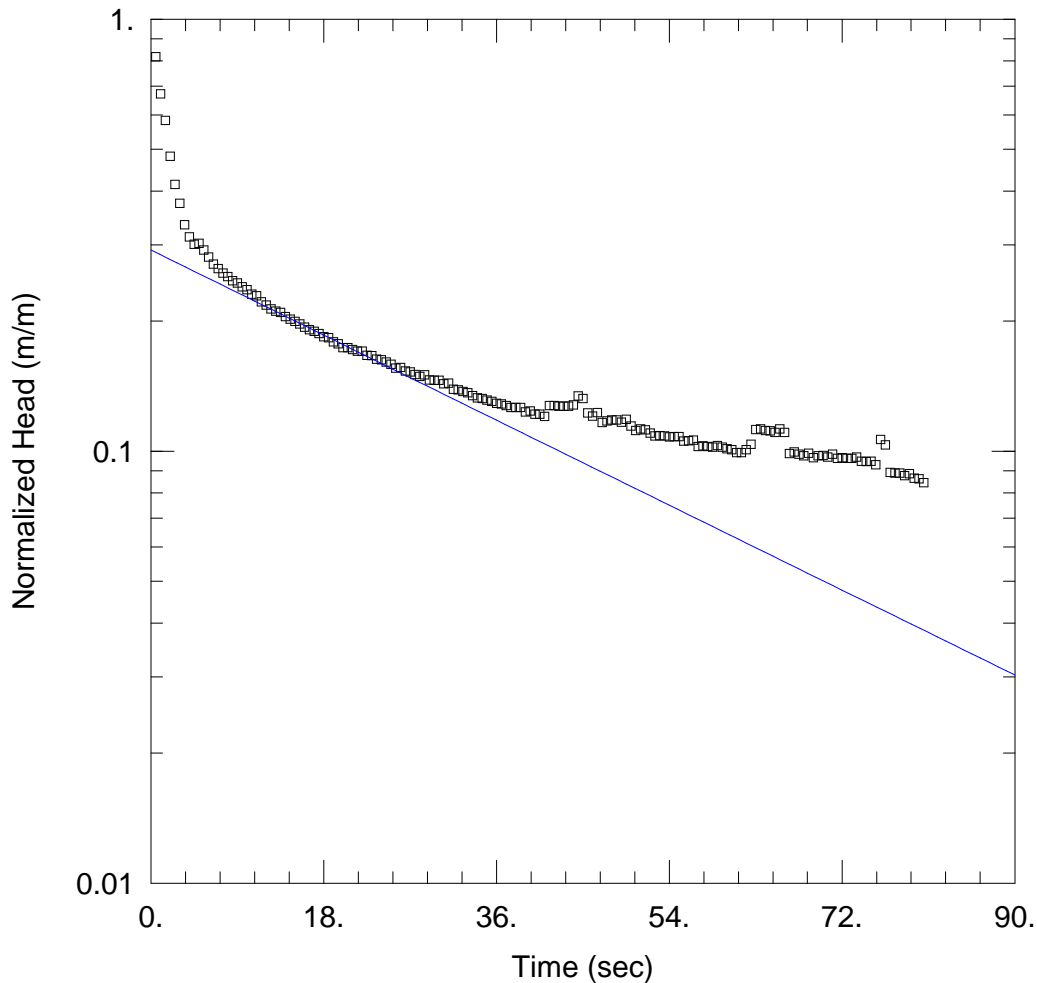
Saturated Thickness: 2.914 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-04)

Initial Displacement: 0.23 m Static Water Column Height: 2.914 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 7.659E-6 m/sec y0 = 0.08518 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-04 RH2.aqt
 Date: 03/21/14 Time: 12:22:47

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-04
 Test Date: Aug 27, 2013

AQUIFER DATA

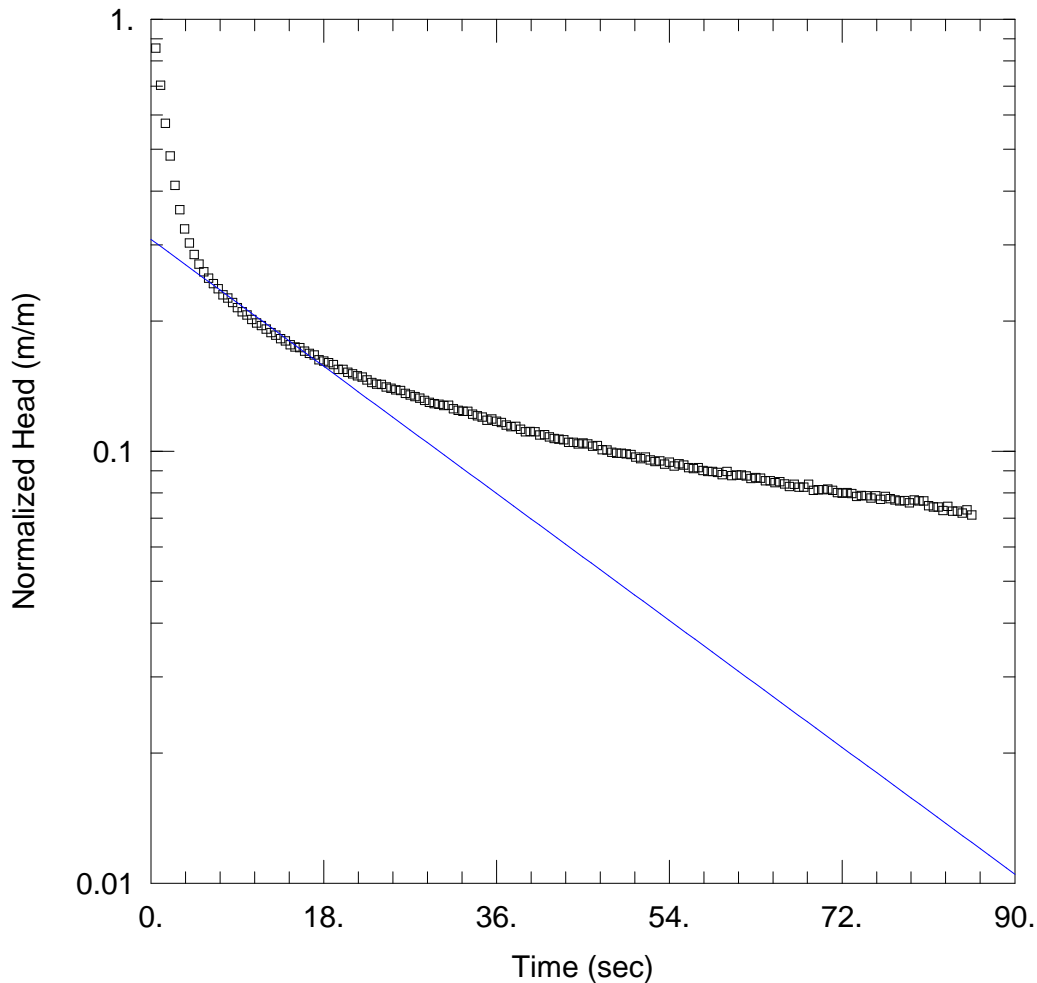
Saturated Thickness: 2.914 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-04)

Initial Displacement: -0.3385 m Static Water Column Height: 2.914 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 1.024E-5 m/sec y0 = -0.09885 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-04 RH3.aqt
 Date: 03/21/14 Time: 12:23:03

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-04
 Test Date: Aug 27, 2013

AQUIFER DATA

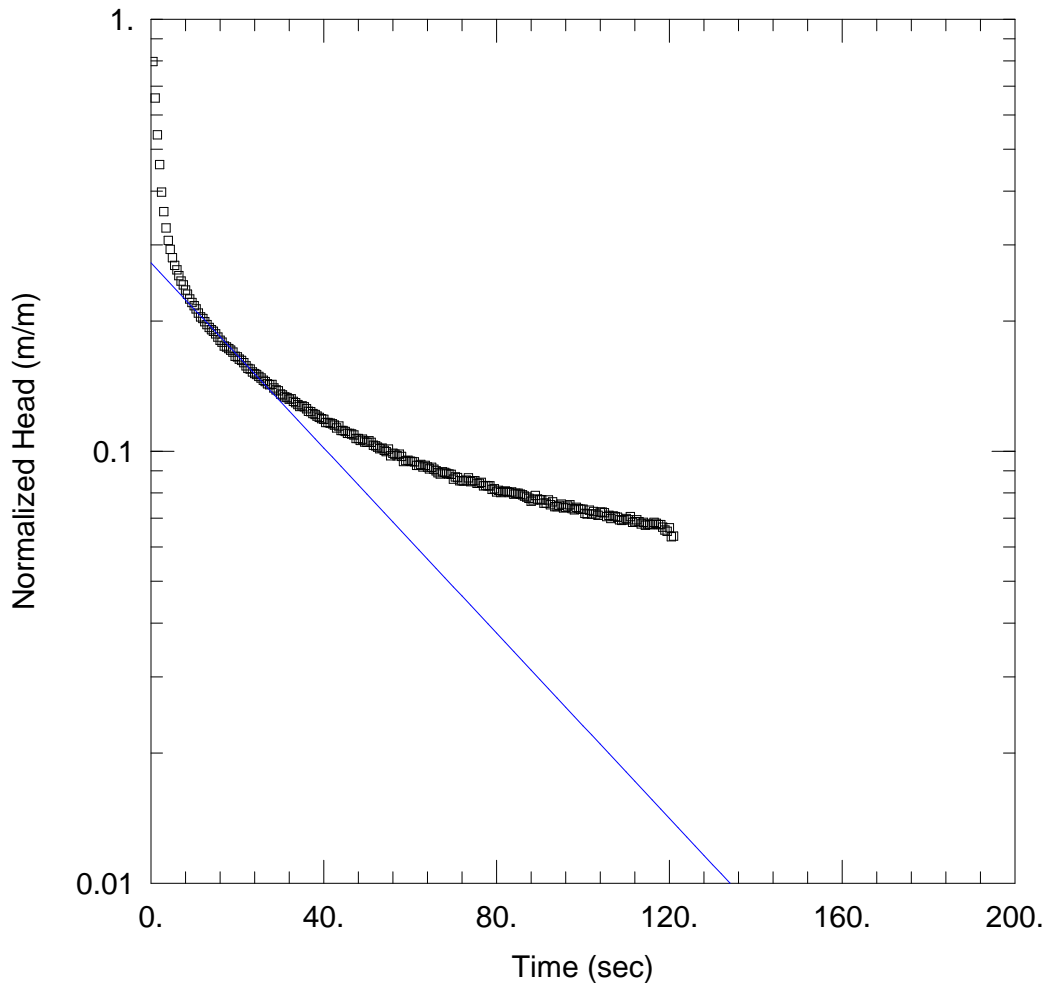
Saturated Thickness: 2.914 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-04)

Initial Displacement: -0.4214 m Static Water Column Height: 2.914 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 1.529E-5 m/sec y0 = -0.1303 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-04 RH4.aqt
 Date: 03/21/14 Time: 12:23:12

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-04
 Test Date: Aug 27, 2013

AQUIFER DATA

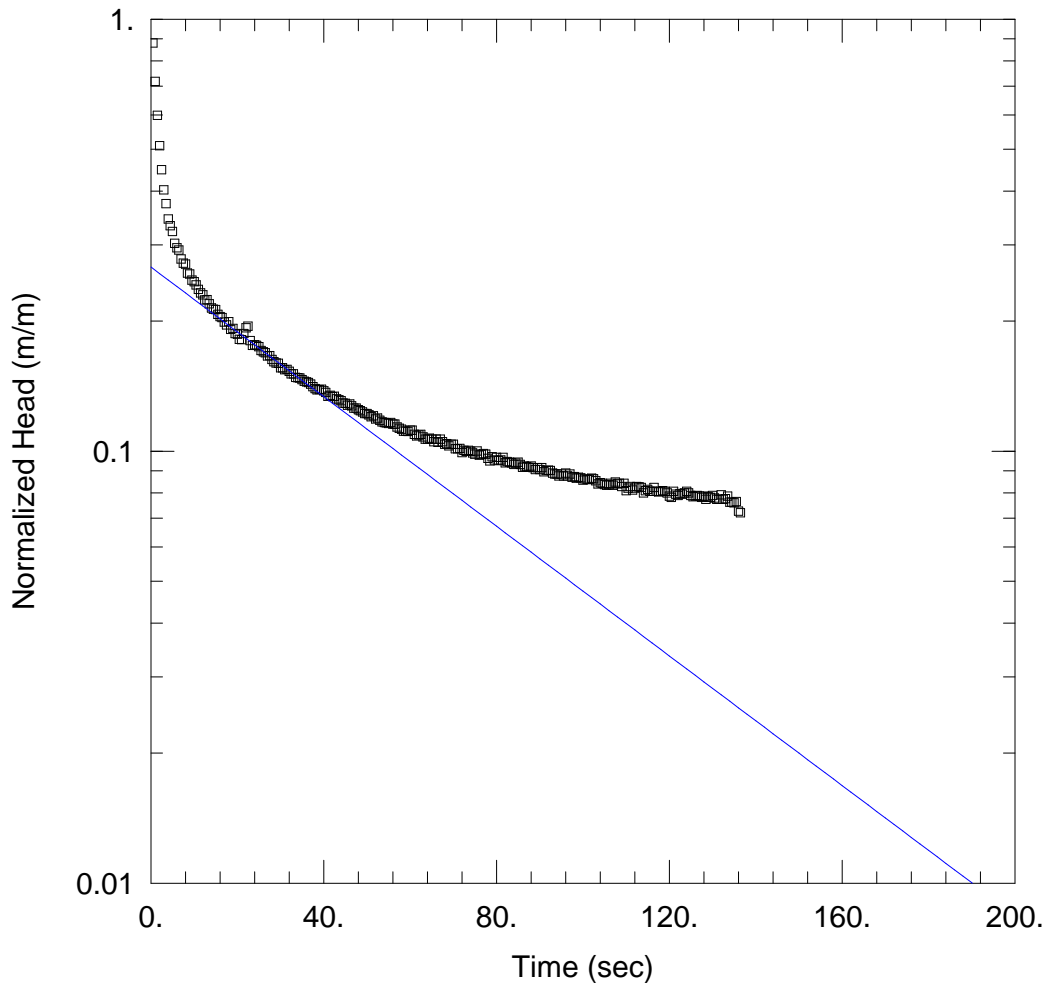
Saturated Thickness: 2.914 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-04)

Initial Displacement: -0.4154 m Static Water Column Height: 2.914 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 1.004E-5 m/sec y0 = -0.1134 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-04 RH5.aqt
 Date: 03/21/14 Time: 12:23:20

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-04
 Test Date: Aug 27, 2013

AQUIFER DATA

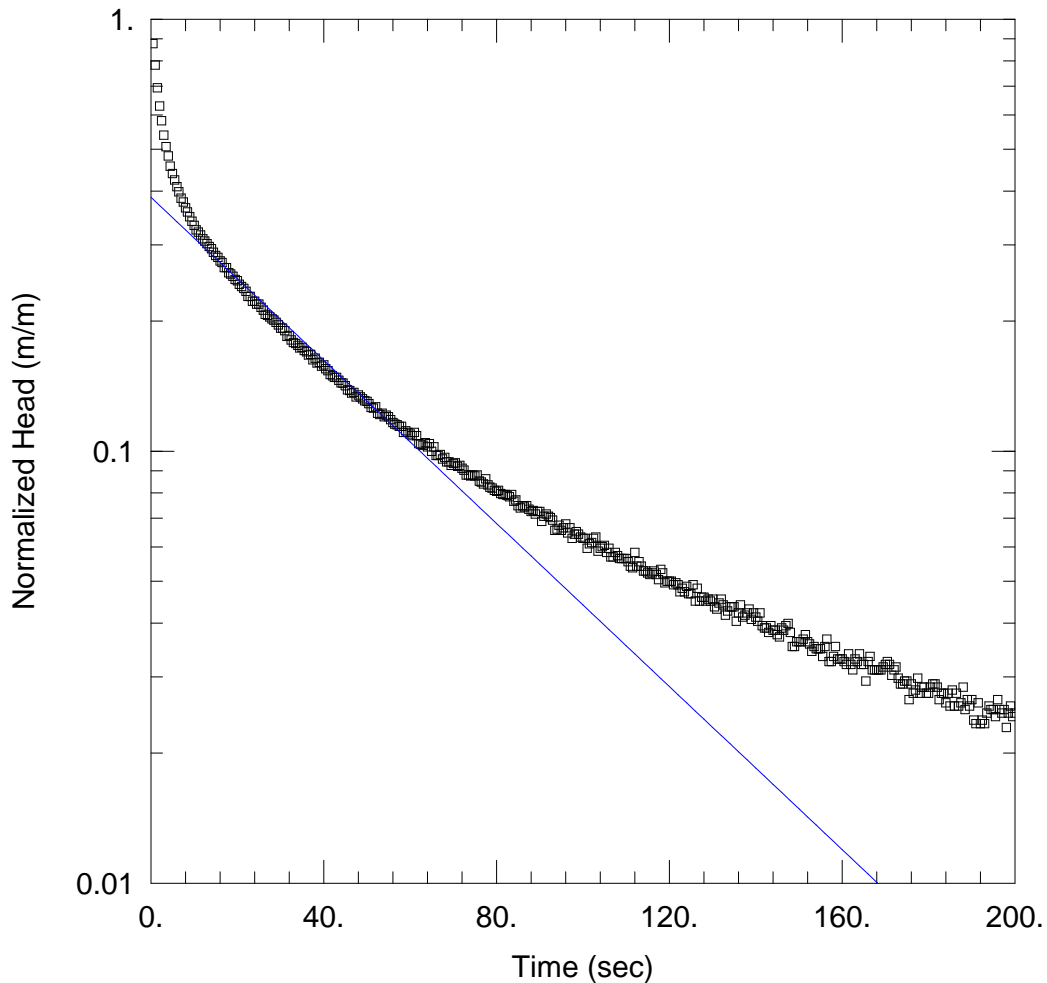
Saturated Thickness: 2.914 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-04)

Initial Displacement: -0.3595 m Static Water Column Height: 2.914 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 7.025E-6 m/sec y0 = -0.09589 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-08 RH1.aqt
 Date: 03/21/14 Time: 12:30:40

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-08
 Test Date: Aug 29, 2013

AQUIFER DATA

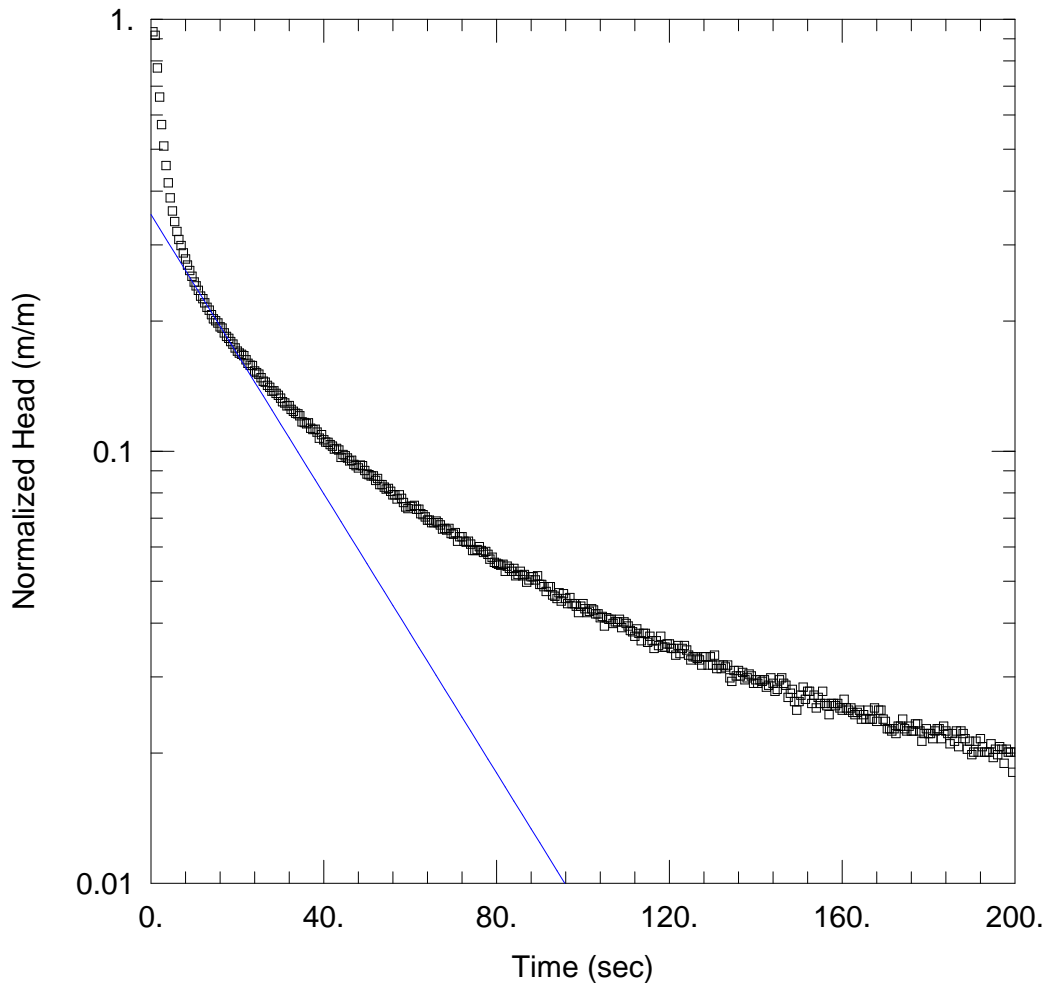
Saturated Thickness: 2.828 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-08)

Initial Displacement: -0.218 m Static Water Column Height: 2.828 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 9.095E-6 m/sec y0 = -0.08434 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-08 RH2.aqt
 Date: 03/21/14 Time: 12:30:48

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-08
 Test Date: Aug 29, 2013

AQUIFER DATA

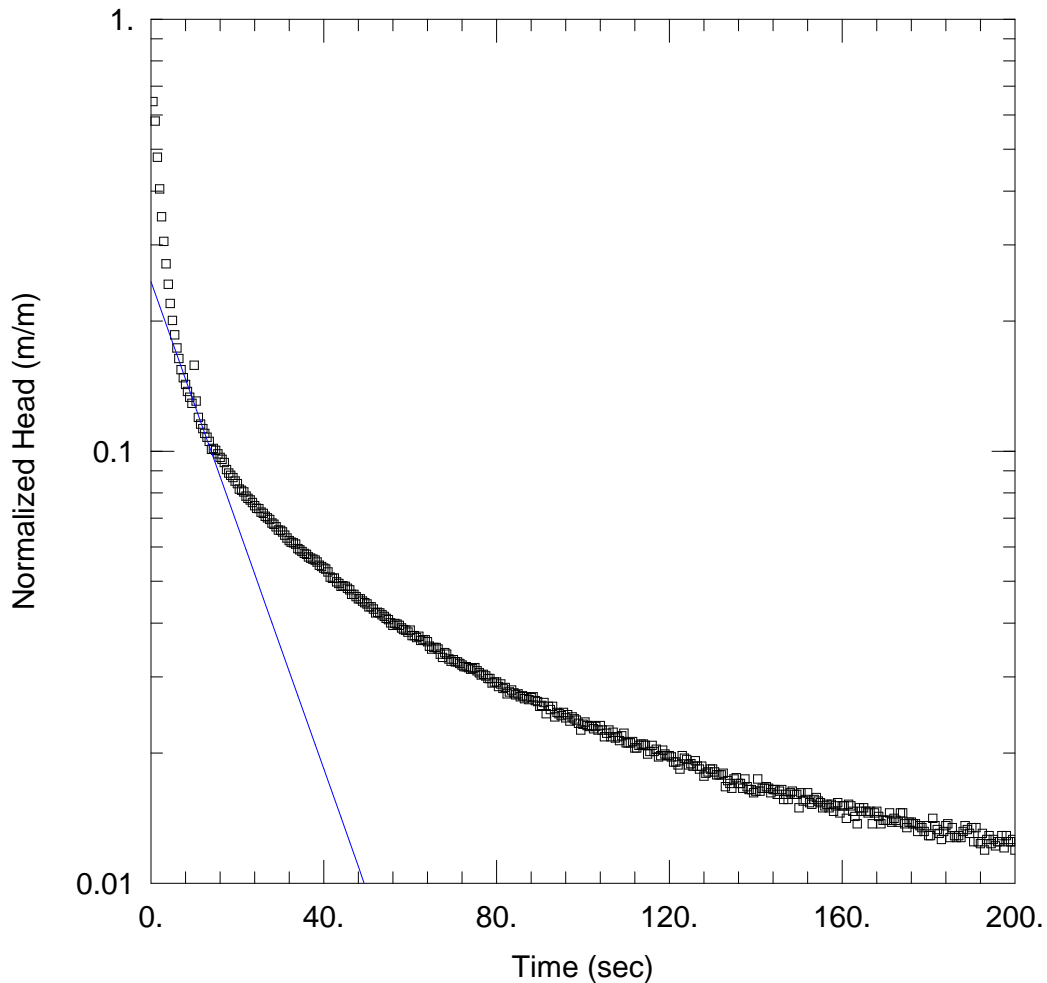
Saturated Thickness: 2.828 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-08)

Initial Displacement: -0.338 m Static Water Column Height: 2.828 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 1.557E-5 m/sec y0 = -0.1192 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-08 RH3.aqt
 Date: 03/21/14 Time: 12:31:02

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-08
 Test Date: Aug 29, 2013

AQUIFER DATA

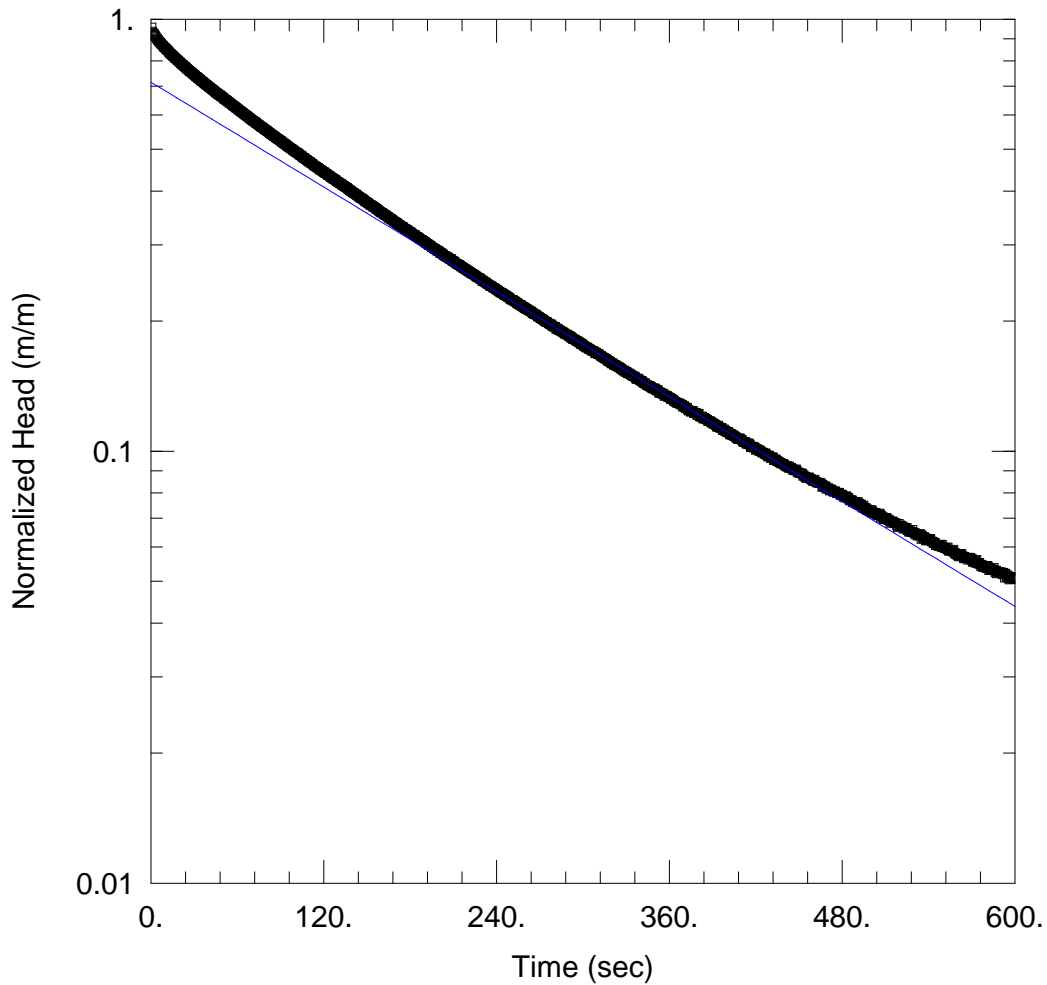
Saturated Thickness: 2.828 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-08)

Initial Displacement: -0.7292 m Static Water Column Height: 2.828 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 2.716E-5 m/sec y0 = -0.1799 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-09 RH1.aqt
 Date: 03/21/14 Time: 12:31:35

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-09
 Test Date: Aug 29, 2013

AQUIFER DATA

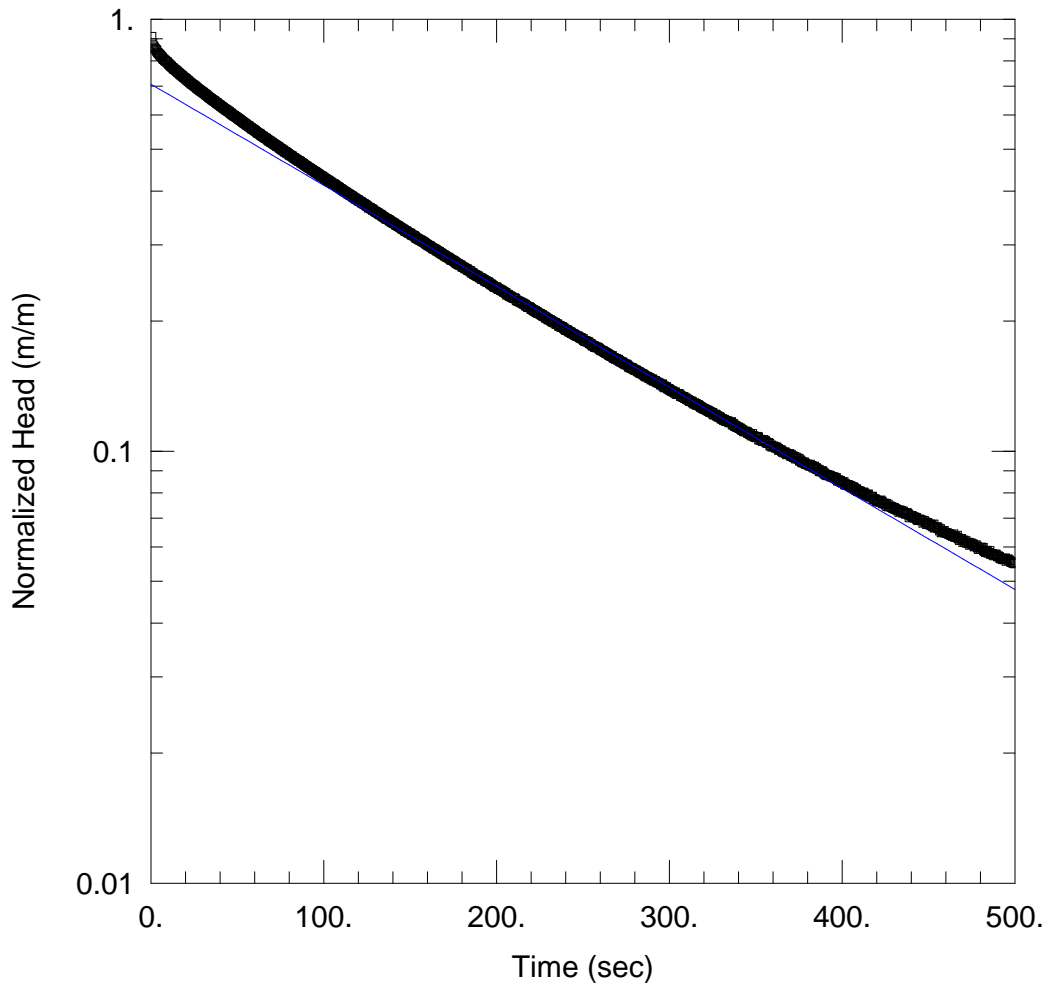
Saturated Thickness: 3.551 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-09)

Initial Displacement: -0.7301 m Static Water Column Height: 3.551 m
 Total Well Penetration Depth: 3.551 m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 1.897E-6 m/sec y0 = -0.5217 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-09 RH2.aqt
 Date: 03/21/14 Time: 12:31:42

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-09
 Test Date: Aug 29, 2013

AQUIFER DATA

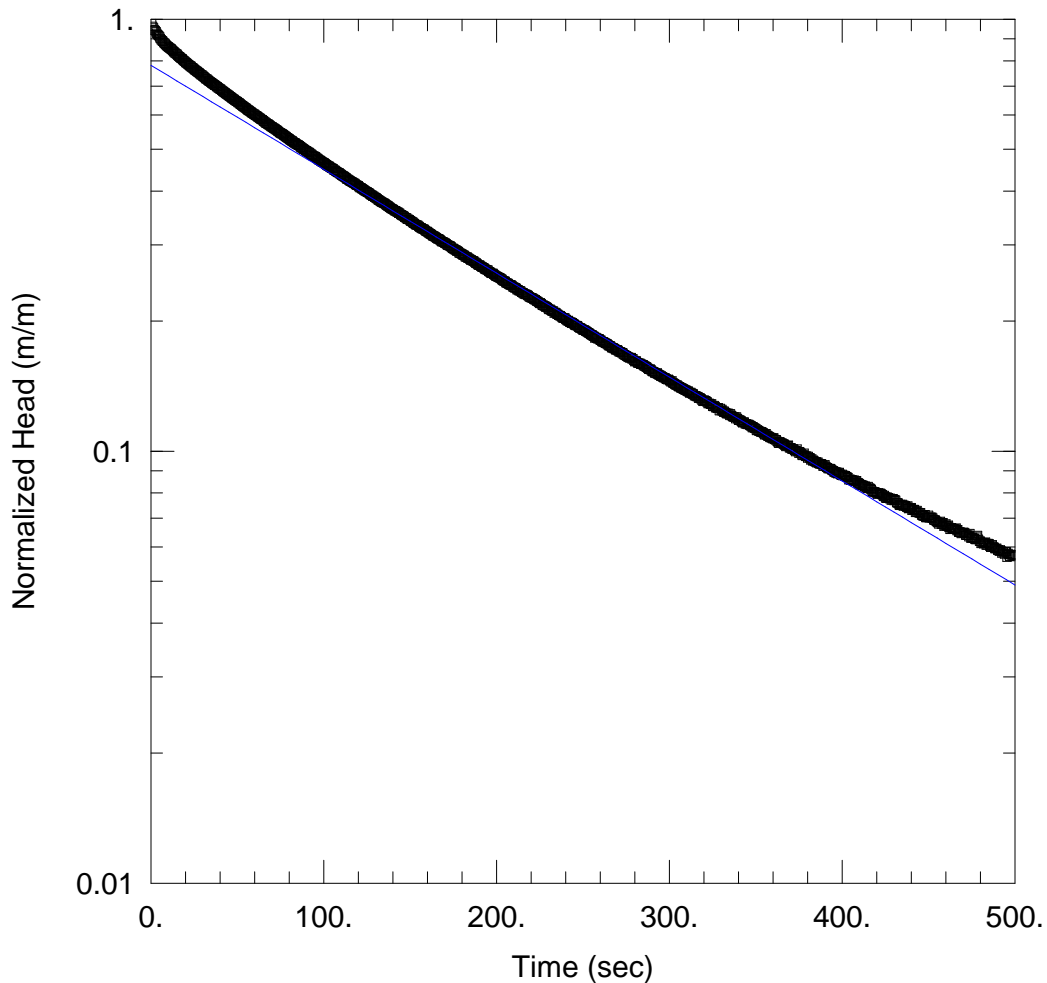
Saturated Thickness: 3.551 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-09)

Initial Displacement: -0.7874 m Static Water Column Height: 3.551 m
 Total Well Penetration Depth: 3.551 m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 2.194E-6 m/sec y0 = -0.5567 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-09 RH3.aqt
 Date: 03/21/14 Time: 12:31:50

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-09
 Test Date: Aug 29, 2013

AQUIFER DATA

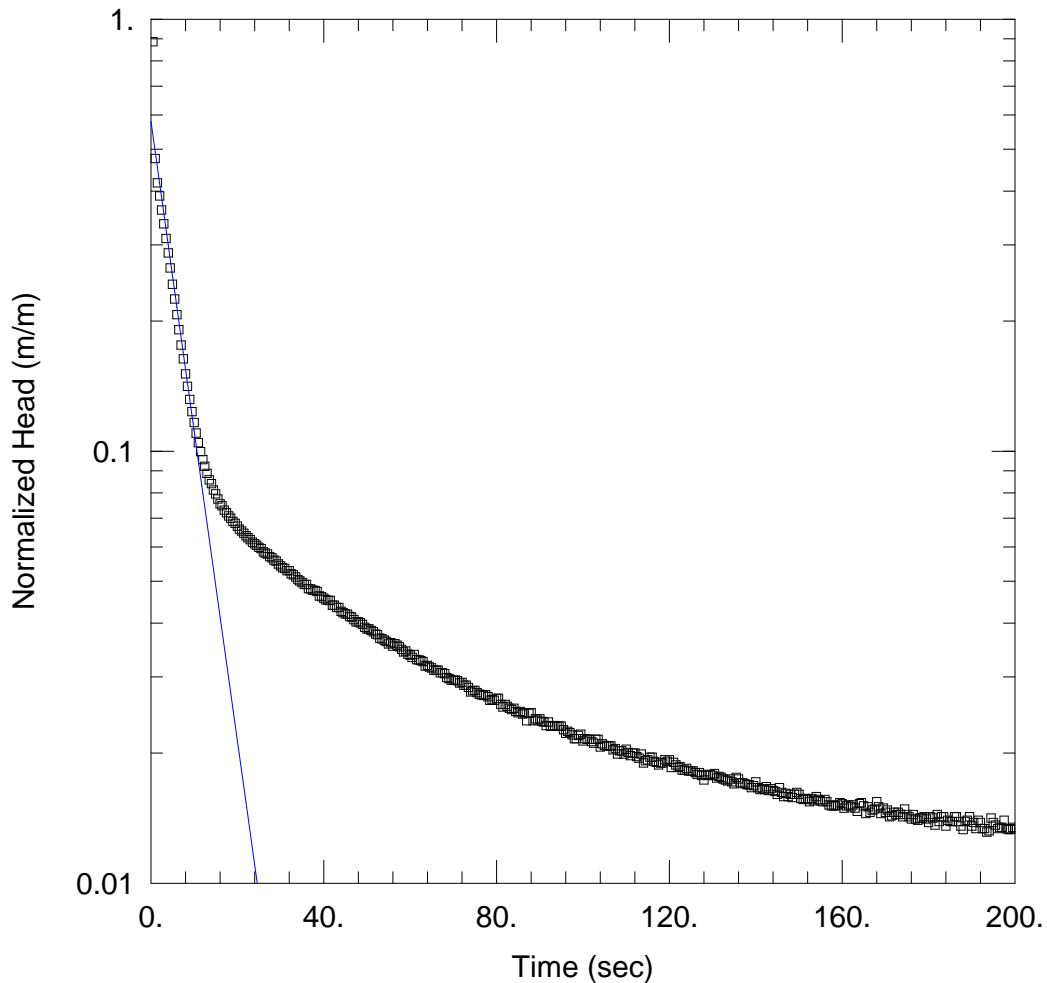
Saturated Thickness: 3.551 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-09)

Initial Displacement: -0.7194 m Static Water Column Height: 3.551 m
 Total Well Penetration Depth: 3.551 m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 2.256E-6 m/sec y0 = -0.5624 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-10 RH1.aqt
 Date: 03/21/14 Time: 12:33:01

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-10
 Test Date: Aug 29, 2013

AQUIFER DATA

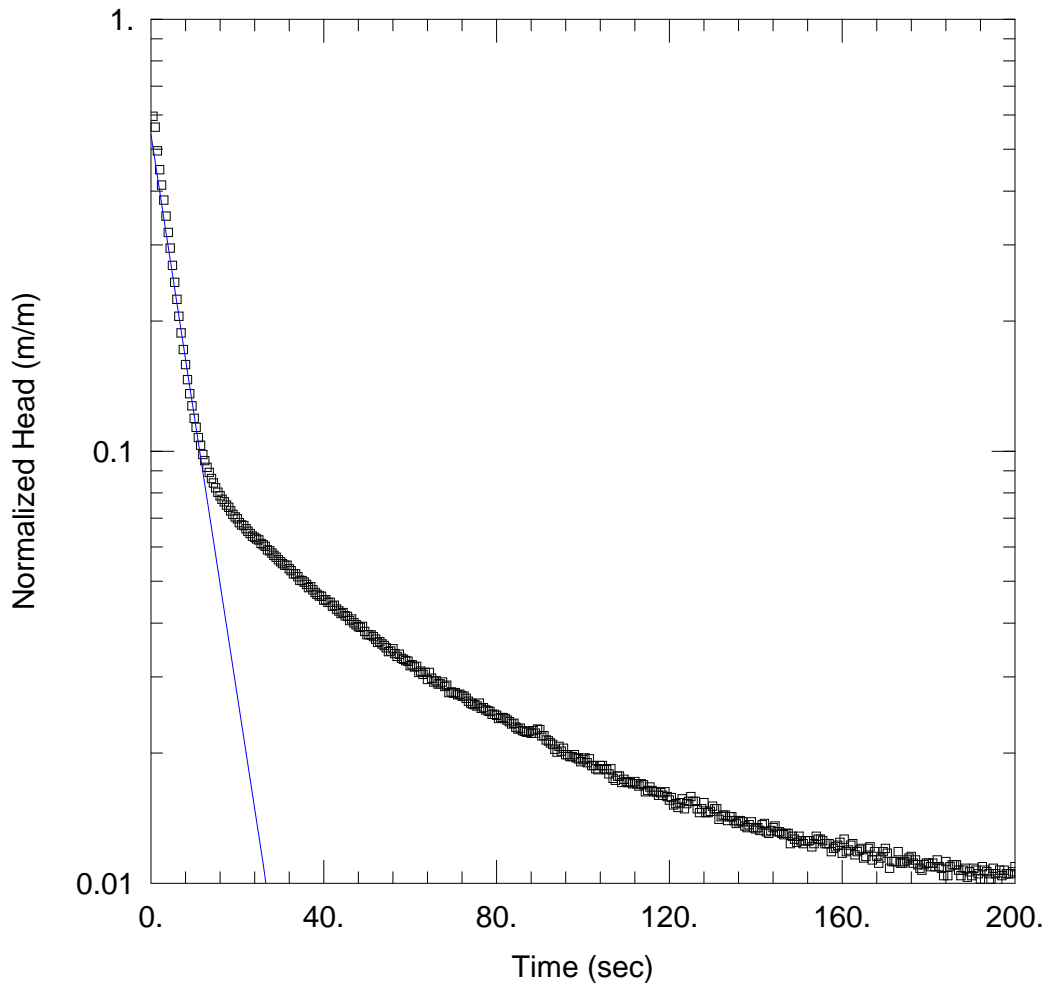
Saturated Thickness: 2.48 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-10)

Initial Displacement: -1.166 m Static Water Column Height: 2.48 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 7.832E-5 m/sec y0 = -0.6755 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-10 RH2.aqt
 Date: 03/21/14 Time: 12:33:09

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-10
 Test Date: Aug 29, 2013

AQUIFER DATA

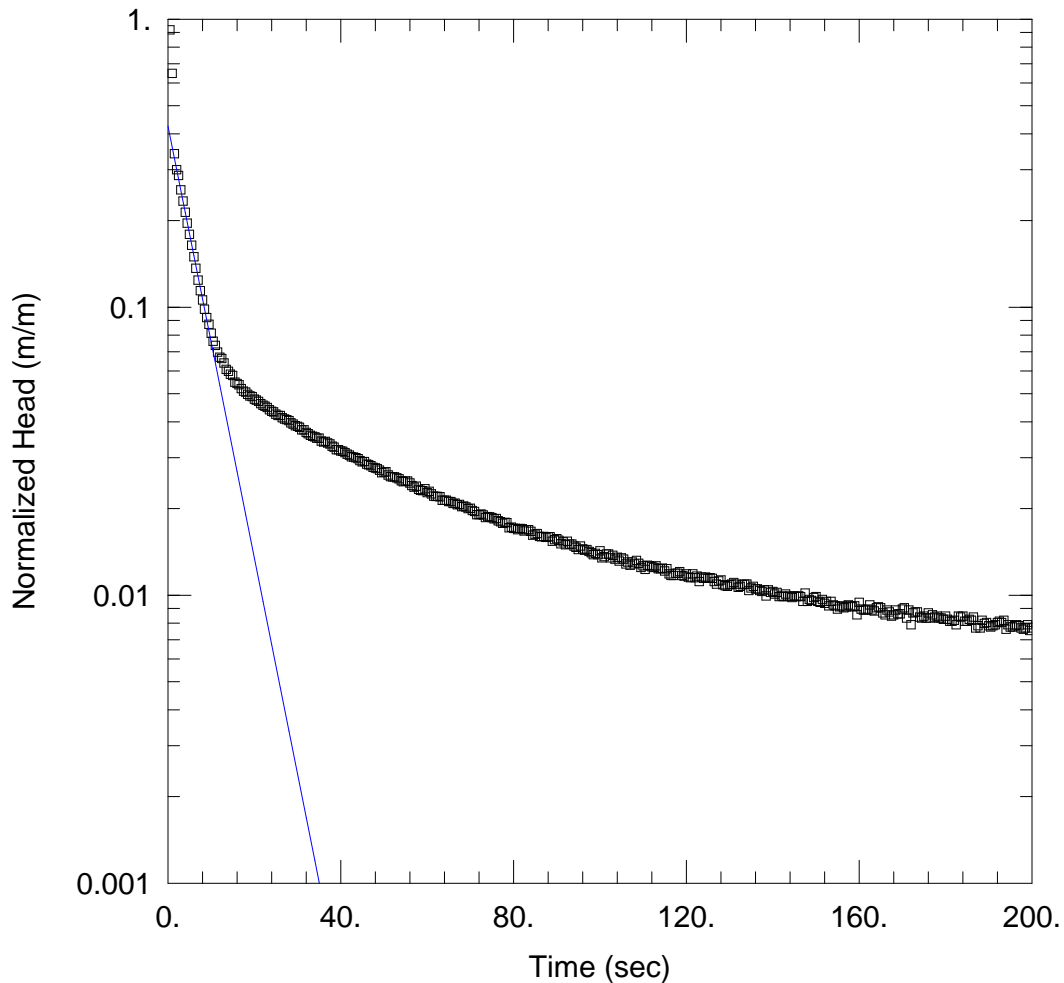
Saturated Thickness: 2.48 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-10)

Initial Displacement: -0.989 m Static Water Column Height: 2.48 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 7.104E-5 m/sec y0 = -0.5343 m



WELL TEST ANALYSIS

Data Set: C:\Users\CMeldrum\Desktop\Slug Tests\MW13-10 RH3.aqt
 Date: 03/21/14 Time: 12:33:18

PROJECT INFORMATION

Company: Golder Associates Ltd.
 Project: 12-1021-0006
 Test Well: MW13-10
 Test Date: Aug 29, 2013

AQUIFER DATA

Saturated Thickness: 2.48 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW13-10)

Initial Displacement: -1.418 m Static Water Column Height: 2.48 m
 Total Well Penetration Depth: 3. m Screen Length: 3. m
 Casing Radius: 0.0254 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 8.197E-5 m/sec y0 = -0.6024 m

ATTACHMENT 3
Chain of Custodies and Laboratory Reports

Your Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Your C.O.C. #: 24324

Attention: Stefan Woztal
 GOLDER ASSOCIATES LTD
 4260 STILL CREEK DRIVE
 Suite 500
 BURNABY, BC
 Canada V5C 6C6

Report Date: 2013/08/20

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B367755
Received: 2013/08/06, 09:20

Sample Matrix: Water
 # Samples Received: 7

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity - Water	7	2013/08/07	2013/08/07	BBY6SOP-00026	SM2320B
BTEX/MTBE LH, VH, F1 SIM/MS	7	2013/08/07	2013/08/08	BBY8-SOP-00010	EPA 8260C
Cyanide SAD (strong acid dissociable)	7	N/A	2013/08/19	BBY6SOP-00004	SM-4500CN I
Conductance - water	7	N/A	2013/08/07	BBY6SOP-00026	SM-2510B
Hardness (calculated as CaCO3)	7	N/A	2013/08/09	BBY7SOP-00002	EPA 6020A
Extrac. Pet HC when LEPH/HEPH required	6	2013/08/08	2013/08/11	BBY8SOP-00029	BC Env. Lab Manual
Extrac. Pet HC when LEPH/HEPH required	1	2013/08/08	2013/08/12	BBY8SOP-00029	BC Env. Lab Manual
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	7	N/A	2013/08/09	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (dissolved)	7	N/A	2013/08/08	BBY7SOP-00002	EPA 6020A
Ammonia-N (Unpreserved)	7	N/A	2013/08/07	BBY6SOP-00009	SM-4500NH3G
Nitrate + Nitrite (N)	7	N/A	2013/08/07	BBY6SOP-00010	SM 4500NO3-I
Nitrite (N) by CFA	7	N/A	2013/08/07	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	7	N/A	2013/08/07	BBY6SOP-00010	SM 4500NO3-I
PAH in Water by GC/MS (SIM)	3	2013/08/08	2013/08/09	BBY8SOP-00021	EPA 8270D
PAH in Water by GC/MS (SIM)	4	2013/08/08	2013/08/12	BBY8SOP-00021	EPA 8270D
Total LMW, HMW, Total PAH Calc	3	N/A	2013/08/10	BBY WI-00033	BC MOE Lab Method
Total LMW, HMW, Total PAH Calc	4	N/A	2013/08/13	BBY WI-00033	BC MOE Lab Method
pH Water	7	N/A	2013/08/07	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	6	N/A	2013/08/07	BBY6SOP-00017	SM4500-SO42- E
Sulphate by Automated Colourimetry	1	N/A	2013/08/08	BBY6SOP-00017	SM4500-SO42- E
Total Dissolved Solids (Filt. Residue)	7	2013/08/07	2013/08/08	BBY6SOP-00033	SM 2540C
EPH less PAH in Water by GC/FID	3	N/A	2013/08/12	BBY WI-00033	BC MOE Lab Method
EPH less PAH in Water by GC/FID	4	N/A	2013/08/13	BBY WI-00033	BC MOE Lab Method
Total Suspended Solids	6	N/A	2013/08/08	BBY6SOP-00034	SM - 2540 D
Total Suspended Solids	1	N/A	2013/08/09	BBY6SOP-00034	SM - 2540 D
Turbidity	7	N/A	2013/08/07	BBY6SOP-00027	SM - 2130B

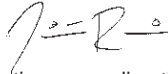
* Results relate only to the items tested.

Maxxam Job #: B367755
Report Date: 2013/08/20

GOLDER ASSOCIATES LTD
Client Project #: 12-1021-0006
Site Location: PHASE 7000/7300 SA DENA HES
Sampler Initials: AB

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Encryption Key



Tabitha Rudkin

20 Aug 2013 14:50:24 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Tabitha Rudkin, Burnaby Project Manager
Email: TRudkin@maxxam.ca
Phone# (604) 638-2639

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B367755
 Report Date: 2013/08/20

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		HC5314	HC5315		HC5316		HC5317	HC5318	HC5319	HC5320		
Sampling Date		2013/07/31 15:40	2013/07/31 16:50	QC Batch	2013/08/01 13:40	QC Batch	2013/08/01 16:55	2013/08/02 14:40	2013/08/02 14:40	2013/08/02 17:00	RDL	QC Batch
	UNITS	24324-01	24324-02		24324-03		24324-04	24324-05	24324-06	24324-07		
ANIONS												
Nitrite (N)	mg/L	<0.0050 ⁽¹⁾	<0.0050 ⁽¹⁾	7057579	<0.0050 ⁽¹⁾	7057579	<0.0050 ⁽¹⁾	<0.0050 ⁽¹⁾	<0.0050 ⁽¹⁾	<0.0050 ⁽¹⁾	0.0050	7057579
Calculated Parameters												
Nitrate (N)	mg/L	0.371	0.104	7054034	0.279	7054034	1.65	0.155	0.158	0.027	0.020	7054034
Misc. Inorganics												
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00125	0.00115	7087731	0.00124	7087731	0.00119	0.00074	0.00083	0.00123	0.00050	7087731
Alkalinity (Total as CaCO ₃)	mg/L	202	243	7055901	250	7055901	109	45.8	45.3	226	0.50	7055901
Alkalinity (PP as CaCO ₃)	mg/L	<0.50	<0.50	7055901	<0.50	7055901	<0.50	<0.50	<0.50	<0.50	0.50	7055901
Bicarbonate (HCO ₃)	mg/L	246	296	7055901	306	7055901	133	55.9	55.2	276	0.50	7055901
Carbonate (CO ₃)	mg/L	<0.50	<0.50	7055901	<0.50	7055901	<0.50	<0.50	<0.50	<0.50	0.50	7055901
Hydroxide (OH)	mg/L	<0.50	<0.50	7055901	<0.50	7055901	<0.50	<0.50	<0.50	<0.50	0.50	7055901
Anions												
Dissolved Sulphate (SO ₄)	mg/L	42.4	49.8	7057432	8.36	7061764	49.0	8.86	9.38	166	0.50	7057432
Nutrients												
Ammonia (N)	mg/L	<0.0050 ⁽¹⁾	0.0377 ⁽¹⁾	7057000	<0.0050 ⁽¹⁾	7057000	<0.0050 ⁽¹⁾	<0.0050 ⁽¹⁾	<0.0050 ⁽¹⁾	0.0317 ⁽¹⁾	0.0050	7057000
Nitrate plus Nitrite (N)	mg/L	0.371 ⁽¹⁾	0.104 ⁽¹⁾	7057537	0.279 ⁽¹⁾	7057537	1.65 ⁽¹⁾	0.155 ⁽¹⁾	0.158 ⁽¹⁾	0.027 ⁽¹⁾	0.020	7057537
Physical Properties												
Conductivity	uS/cm	456	533	7055915	477	7055915	316	108	109	729	1.0	7055915
pH	pH Units	8.06	8.06	7055917	8.08	7055917	8.08	7.66	7.50	7.80		7055917
Physical Properties												
Total Suspended Solids	mg/L	2920	1780	7053917	80.7	7053917	303	324	329	38.0	4.0	7053917
Total Dissolved Solids	mg/L	244	314	7054273	278	7054273	200	64	64	480	10	7054273
Turbidity	NTU	>4000 ⁽²⁾	>4000 ⁽²⁾	7055465	71.3 ⁽¹⁾	7055465	323 ⁽¹⁾	382 ⁽¹⁾	420 ⁽¹⁾	57.4 ⁽¹⁾	0.10	7055465

RDL = Reportable Detection Limit

(1) - Sample arrived to laboratory past recommended hold time.

(2) - Sample arrived to laboratory past recommended hold time.

Turbidity result is greater than the highest standard (4000 NTU).

Maxxam Job #: B367755
 Report Date: 2013/08/20

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

BCCSR BTEX/VPH IN WATER (WATER)

Maxxam ID		HC5314	HC5315	HC5316	HC5317	HC5318	HC5319	HC5320		
Sampling Date		2013/07/31 15:40	2013/07/31 16:50	2013/08/01 13:40	2013/08/01 16:55	2013/08/02 14:40	2013/08/02 14:40	2013/08/02 17:00		
	UNITS	24324-01	24324-02	24324-03	24324-04	24324-05	24324-06	24324-07	RDL	QC Batch
Volatiles										
Methyl-tert-butylether (MTBE)	ug/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	4.0	7056029
Benzene	ug/L	<0.40	<0.40	48	<0.40	<0.40	<0.40	<0.40	0.40	7056029
Toluene	ug/L	<0.40	<0.40	4.6	<0.40	<0.40	<0.40	<0.40	0.40	7056029
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7056029
m & p-Xylene	ug/L	<0.40	<0.40	0.40	<0.40	<0.40	<0.40	<0.40	0.40	7056029
o-Xylene	ug/L	<0.40	<0.40	0.44	<0.40	<0.40	<0.40	<0.40	0.40	7056029
Styrene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7056029
Xylenes (Total)	ug/L	<0.40	<0.40	0.84	<0.40	<0.40	<0.40	<0.40	0.40	7056029
VH C6-C10	ug/L	<300	<300	<300	<300	<300	<300	<300	300	7056029
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	96	109	94	95	94	95	94		7056029
4-BROMOFLUOROBENZENE (sur.)	%	103	102	103	103	103	101	102		7056029
D4-1,2-DICHLOROETHANE (sur.)	%	97	91	92	92	97	91	96		7056029

RDL = Reportable Detection Limit

Maxxam Job #: B367755
 Report Date: 2013/08/20

 GOLDR ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

LEPH & HEPH FOR CSR IN WATER (WATER)

Maxxam ID		HC5314		HC5315	HC5316	HC5317	HC5318	HC5319	HC5320		
Sampling Date		2013/07/31 15:40		2013/07/31 16:50	2013/08/01 13:40	2013/08/01 16:55	2013/08/02 14:40	2013/08/02 14:40	2013/08/02 17:00		
	UNITS	24324-01	RDL	24324-02	24324-03	24324-04	24324-05	24324-06	24324-07	RDL	QC Batch
Polycyclic Aromatics											
Low Molecular Weight PAH's	ug/L	<0.50	0.50	<0.50	8.7	<0.50	<0.50	<0.50	<0.50	0.50	7053960
High Molecular Weight PAH's	ug/L	0.54	0.050	<0.050	1.3	<0.050	<0.050	<0.050	<0.050	0.050	7053960
Total PAH	ug/L	0.73	0.50	<0.50	10	<0.50	<0.50	<0.50	<0.50	0.50	7053960
Naphthalene	ug/L	<0.10	0.10	<0.10	5.8	<0.10	<0.10	<0.10	<0.10	0.10	7061635
2-Methylnaphthalene	ug/L	<0.10	0.10	<0.10	0.82	<0.10	<0.10	<0.10	<0.10	0.10	7061635
Quinoline	ug/L	<0.50	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7061635
Acenaphthylene	ug/L	<0.050	0.050	<0.050	0.052	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Acenaphthene	ug/L	<0.050	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Fluorene	ug/L	0.057	0.050	<0.050	0.59	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Phenanthrene	ug/L	0.14	0.050	<0.050	1.4	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Anthracene	ug/L	<0.050 ⁽¹⁾	0.050	<0.010	0.078	<0.010	<0.010	<0.010	<0.010	0.010	7061635
Acridine	ug/L	<0.13 ⁽¹⁾	0.13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Fluoranthene	ug/L	0.12	0.020	<0.020	0.48	<0.020	<0.020	<0.020	<0.020	0.020	7061635
Pyrene	ug/L	0.26	0.020	<0.020	0.21	<0.020	<0.020	<0.020	<0.020	0.020	7061635
Benzo(a)anthracene	ug/L	<0.010	0.010	<0.010	0.14	<0.010	<0.010	<0.010	<0.010	0.010	7061635
Chrysene	ug/L	<0.050	0.050	<0.050	0.20	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Benzo(b&j)fluoranthene	ug/L	<0.050	0.050	<0.050	0.14	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Benzo(k)fluoranthene	ug/L	<0.050	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Benzo(a)pyrene	ug/L	<0.0090	0.0090	<0.0090	0.052	<0.0090	<0.0090	<0.0090	<0.0090	0.0090	7061635
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	0.050	<0.050	0.050	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Dibenz(a,h)anthracene	ug/L	<0.050	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Benzo(g,h,i)perylene	ug/L	0.16	0.050	<0.050	0.053	<0.050	<0.050	<0.050	<0.050	0.050	7061635
Surrogate Recovery (%)											
D10-ANTHRACENE (sur.)	%	82		95	90	98	11 ⁽²⁾	18 ⁽²⁾	74		7061635
D8-ACENAPHTHYLENE (sur.)	%	88		93	92	93	54	60	95		7061635
D8-NAPHTHALENE (sur.)	%	86		88	90	88	73	81	94		7061635
D9-Acridine	%	46 ⁽²⁾		67	61	69	2.0 ⁽²⁾	1.5 ⁽²⁾	47 ⁽²⁾		7061635
TERPHENYL-D14 (sur.)	%	45 ⁽²⁾		68	68	75	21 ⁽²⁾	37 ⁽²⁾	51 ⁽²⁾		7061635
Calculated Parameters											
LEPH (C10-C19 less PAH)	mg/L	0.32	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7055414
HEPH (C19-C32 less PAH)	mg/L	12	0.20	0.81	<0.20	<0.20	1.1	1.1	0.77	0.20	7055414

RDL = Reportable Detection Limit

(1) - RDL raised due to sample matrix interference.

(2) - Surrogate recovery below acceptance criteria due to matrix interference. Re-extraction yields similar results.

Maxxam Job #: B367755
 Report Date: 2013/08/20

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

LEPH & HEPH FOR CSR IN WATER (WATER)

Maxxam ID		HC5314		HC5315	HC5316	HC5317	HC5318	HC5319	HC5320		
Sampling Date		2013/07/31 15:40		2013/07/31 16:50	2013/08/01 13:40	2013/08/01 16:55	2013/08/02 14:40	2013/08/02 14:40	2013/08/02 17:00		
	UNITS	24324-01	RDL	24324-02	24324-03	24324-04	24324-05	24324-06	24324-07	RDL	QC Batch
Ext. Pet. Hydrocarbon											
EPH (C10-C19)	mg/L	0.32	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7061694
EPH (C19-C32)	mg/L	12	0.20	0.81	<0.20	<0.20	1.1	1.1	0.77	0.20	7061694
Surrogate Recovery (%)											
O-TERPHENYL (sur.)	%	107		94	92	93	91	92	91		7061694

RDL = Reportable Detection Limit

Maxxam Job #: B367755
 Report Date: 2013/08/20

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

CSR DISSOLVED METALS IN WATER (WATER)

Maxxam ID		HC5314	HC5315	HC5316	HC5317	HC5318	HC5319	HC5320		
Sampling Date		2013/07/31 15:40	2013/07/31 16:50	2013/08/01 13:40	2013/08/01 16:55	2013/08/02 14:40	2013/08/02 14:40	2013/08/02 17:00		
	UNITS	24324-01	24324-02	24324-03	24324-04	24324-05	24324-06	24324-07	RDL	QC Batch
Misc. Inorganics										
Dissolved Hardness (CaCO3)	mg/L	228	296	266	166	52.7	53.6	394	0.50	7054020

RDL = Reportable Detection Limit

Maxxam Job #: B367755
 Report Date: 2013/08/20

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

CSR DISSOLVED METALS IN WATER (WATER)

Maxxam ID		HC5314	HC5315	HC5316	HC5317	HC5318	HC5319	HC5320		
Sampling Date		2013/07/31 15:40	2013/07/31 16:50	2013/08/01 13:40	2013/08/01 16:55	2013/08/02 14:40	2013/08/02 14:40	2013/08/02 17:00		
	UNITS	24324-01	24324-02	24324-03	24324-04	24324-05	24324-06	24324-07	RDL	QC Batch
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	mg/L	0.0035	0.0047	<0.0030	<0.0030	0.0063	0.0072	0.0072	0.0030	7057584
Dissolved Antimony (Sb)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00051	0.00050	7057584
Dissolved Arsenic (As)	mg/L	0.00049	0.00026	0.00012	0.00050	0.00085	0.00090	0.0387	0.00010	7057584
Dissolved Barium (Ba)	mg/L	0.0342	0.0356	0.139	0.0426	0.0181	0.0180	0.0252	0.0010	7057584
Dissolved Beryllium (Be)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7057584
Dissolved Bismuth (Bi)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7057584
Dissolved Boron (B)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7057584
Dissolved Cadmium (Cd)	mg/L	0.000531	0.000160	0.000064	0.000049	0.000258	0.000257	0.000673	0.000010	7057584
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7057584
Dissolved Cobalt (Co)	mg/L	0.00151	0.00430	<0.00050	<0.00050	0.00142	0.00142	0.00503	0.00050	7057584
Dissolved Copper (Cu)	mg/L	0.00027	0.00043	0.00027	0.00023	0.00071	0.00069	0.00082	0.00020	7057584
Dissolved Iron (Fe)	mg/L	<0.0050	0.0294	0.0054	<0.0050	0.0107	0.0108	0.235	0.0050	7057584
Dissolved Lead (Pb)	mg/L	0.00195	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7057584
Dissolved Lithium (Li)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0087	0.0050	7057584
Dissolved Manganese (Mn)	mg/L	0.185	0.631	0.0413	0.0043	0.116	0.114	0.528	0.0010	7057584
Dissolved Mercury (Hg)	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	7057584
Dissolved Molybdenum (Mo)	mg/L	0.0023	0.0016	<0.0010	<0.0010	0.0063	0.0062	0.0413	0.0010	7057584
Dissolved Nickel (Ni)	mg/L	0.0032	0.0133	0.0017	<0.0010	0.0085	0.0083	0.0318	0.0010	7057584
Dissolved Selenium (Se)	mg/L	0.00201	0.00090	0.00114	0.00311	0.00483	0.00509	0.00173	0.00010	7057584
Dissolved Silicon (Si)	mg/L	4.27	4.44	3.94	4.92	4.22	4.37	16.6	0.10	7057584
Dissolved Silver (Ag)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	7057584
Dissolved Strontium (Sr)	mg/L	0.331	0.298	0.280	0.163	0.0428	0.0425	0.403	0.0010	7057584
Dissolved Thallium (Tl)	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	7057584
Dissolved Tin (Sn)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7057584
Dissolved Titanium (Ti)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7057584
Dissolved Uranium (U)	mg/L	0.00236	0.00089	0.00122	0.00071	<0.00010	<0.00010	0.0250	0.00010	7057584
Dissolved Vanadium (V)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7057584
Dissolved Zinc (Zn)	mg/L	0.0106	<0.0050	<0.0050	<0.0050	0.0081	0.0084	0.147	0.0050	7057584
Dissolved Zirconium (Zr)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	7057584
Dissolved Calcium (Ca)	mg/L	78.1	99.8	91.3	61.0	18.0	18.5	139	0.050	7054021
Dissolved Magnesium (Mg)	mg/L	8.02	11.4	9.34	3.28	1.91	1.79	11.5	0.050	7054021
Dissolved Potassium (K)	mg/L	1.27	1.26	0.649	0.486	0.564	0.577	2.45	0.050	7054021
Dissolved Sodium (Na)	mg/L	8.77	1.62	0.941	0.767	0.548	0.531	8.26	0.050	7054021
Dissolved Sulphur (S)	mg/L	15.1	18.5	<3.0	18.0	<3.0	3.3	61.2	3.0	7054021

RDL = Reportable Detection Limit

Maxxam Job #: B367755
Report Date: 2013/08/20

GOLDER ASSOCIATES LTD
Client Project #: 12-1021-0006
Site Location: PHASE 7000/7300 SA DENA HES
Sampler Initials: AB

General Comments

Sample HC5314-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HC5315-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HC5316-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HC5317-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HC5318-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HC5319-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HC5320-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Maxxam Job #: B367755
 Report Date: 2013/08/20

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7053917	Total Suspended Solids	2013/08/08	NC	80 - 120	100	80 - 120	<4.0	mg/L	7.0	20
7054273	Total Dissolved Solids	2013/08/08	NC	80 - 120	88	80 - 120	<10	mg/L	0.4	20
7055465	Turbidity	2013/08/07			101	80 - 120	<0.10	NTU	NC	20
7055901	Alkalinity (Total as CaCO3)	2013/08/07	NC	80 - 120	96	80 - 120	<0.50	mg/L	NC	20
7055901	Alkalinity (PP as CaCO3)	2013/08/07					<0.50	mg/L	NC	20
7055901	Bicarbonate (HCO3)	2013/08/07					<0.50	mg/L	NC	20
7055901	Carbonate (CO3)	2013/08/07					<0.50	mg/L	NC	20
7055901	Hydroxide (OH)	2013/08/07					<0.50	mg/L	NC	20
7055915	Conductivity	2013/08/08			98	80 - 120	<1.0	uS/cm	0	20
7056029	1,4-Difluorobenzene (sur.)	2013/08/07	108	70 - 130	108	70 - 130	107	%		
7056029	4-BROMOFLUOROBENZENE (sur.)	2013/08/07	103	70 - 130	103	70 - 130	103	%		
7056029	D4-1,2-DICHLOROETHANE (sur.)	2013/08/07	93	70 - 130	95	70 - 130	99	%		
7056029	Methyl-tert-butylether(MTBE)	2013/08/08	101	70 - 130	95	70 - 130	<4.0	ug/L	NC	30
7056029	Benzene	2013/08/08	97	70 - 130	89	70 - 130	<0.40	ug/L	2.9	30
7056029	Toluene	2013/08/08	97	70 - 130	90	70 - 130	<0.40	ug/L	4.6(1)	30
7056029	Ethylbenzene	2013/08/08	101	70 - 130	94	70 - 130	<0.40	ug/L	4.2(1)	30
7056029	m & p-Xylene	2013/08/08	99	70 - 130	92	70 - 130	<0.40	ug/L	4.1(1)	30
7056029	o-Xylene	2013/08/08	103	70 - 130	94	70 - 130	<0.40	ug/L	3.3(1)	30
7056029	Styrene	2013/08/08	108	70 - 130	100	70 - 130	<0.40	ug/L	NC	30
7056029	VH C6-C10	2013/08/08			77	70 - 130	<300	ug/L	2.4(1)	30
7056029	Xylenes (Total)	2013/08/08					<0.40	ug/L	4.0	30
7057000	Ammonia (N)	2013/08/07	87	80 - 120	97	80 - 120	<0.0050	mg/L	0.8	20
7057432	Dissolved Sulphate (SO4)	2013/08/07	NC	80 - 120	95	80 - 120	0.73, RDL=0.50	mg/L	0.4	20
7057537	Nitrate plus Nitrite (N)	2013/08/07	94	80 - 120	104	80 - 120	<0.020	mg/L	0.5	25
7057579	Nitrite (N)	2013/08/07	39(2)	80 - 120	101	80 - 120	<0.0050	mg/L	NC	20
7057584	Dissolved Aluminum (Al)	2013/08/08	102	80 - 120	106	80 - 120	<0.0030	mg/L	NC	20
7057584	Dissolved Antimony (Sb)	2013/08/08	98	80 - 120	100	80 - 120	<0.00050	mg/L	NC	20
7057584	Dissolved Arsenic (As)	2013/08/08	102	80 - 120	101	80 - 120	<0.00010	mg/L	NC	20
7057584	Dissolved Barium (Ba)	2013/08/08	100	80 - 120	104	80 - 120	<0.0010	mg/L	NC	20
7057584	Dissolved Beryllium (Be)	2013/08/08	100	80 - 120	99	80 - 120	<0.00010	mg/L	NC	20
7057584	Dissolved Bismuth (Bi)	2013/08/08	82	80 - 120	104	80 - 120	<0.0010	mg/L	NC	20
7057584	Dissolved Cadmium (Cd)	2013/08/08	101	80 - 120	101	80 - 120	<0.000010	mg/L	NC	20
7057584	Dissolved Chromium (Cr)	2013/08/08	97	80 - 120	96	80 - 120	<0.0010	mg/L	NC	20
7057584	Dissolved Cobalt (Co)	2013/08/08	97	80 - 120	96	80 - 120	<0.00050	mg/L	NC	20
7057584	Dissolved Copper (Cu)	2013/08/08	96	80 - 120	94	80 - 120	<0.00020	mg/L	NC	20
7057584	Dissolved Iron (Fe)	2013/08/08	101	80 - 120	95	80 - 120	<0.0050	mg/L	NC	20
7057584	Dissolved Lead (Pb)	2013/08/08	99	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20
7057584	Dissolved Lithium (Li)	2013/08/08	95	80 - 120	94	80 - 120	<0.0050	mg/L	NC	20
7057584	Dissolved Manganese (Mn)	2013/08/08	98	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20
7057584	Dissolved Mercury (Hg)	2013/08/08	105	80 - 120	105	80 - 120	<0.000050	mg/L	NC	20

Maxxam Job #: B367755
 Report Date: 2013/08/20

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7057584	Dissolved Molybdenum (Mo)	2013/08/08	103	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7057584	Dissolved Nickel (Ni)	2013/08/08	98	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20
7057584	Dissolved Selenium (Se)	2013/08/08	105	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
7057584	Dissolved Silver (Ag)	2013/08/08	72 (2)	80 - 120	83	80 - 120	<0.000020	mg/L	NC	20
7057584	Dissolved Strontium (Sr)	2013/08/08	96	80 - 120	99	80 - 120	<0.0010	mg/L	NC	20
7057584	Dissolved Thallium (Tl)	2013/08/08	103	80 - 120	106	80 - 120	<0.000050	mg/L	NC	20
7057584	Dissolved Tin (Sn)	2013/08/08	97	80 - 120	100	80 - 120	<0.0050	mg/L	NC	20
7057584	Dissolved Titanium (Ti)	2013/08/08	102	80 - 120	88	80 - 120	<0.0050	mg/L	NC	20
7057584	Dissolved Uranium (U)	2013/08/08	96	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
7057584	Dissolved Vanadium (V)	2013/08/08	98	80 - 120	97	80 - 120	<0.0050	mg/L	NC	20
7057584	Dissolved Zinc (Zn)	2013/08/08	104	80 - 120	98	80 - 120	<0.0050	mg/L	NC	20
7057584	Dissolved Boron (B)	2013/08/08					<0.050	mg/L	NC	20
7057584	Dissolved Silicon (Si)	2013/08/08					<0.10	mg/L	NC	20
7057584	Dissolved Zirconium (Zr)	2013/08/08					<0.00050	mg/L	NC	20
7061635	D10-ANTHRACENE (sur.)	2013/08/09	92	60 - 130	95	60 - 130	80	%		
7061635	D8-ACENAPHTHYLENE (sur.)	2013/08/09	89	50 - 130	89	50 - 130	73	%		
7061635	D8-NAPHTHALENE (sur.)	2013/08/09	89	50 - 130	87	50 - 130	72	%		
7061635	D9-Acridine	2013/08/09	68	50 - 130	71	50 - 130	55	%		
7061635	TERPHENYL-D14 (sur.)	2013/08/09	77	60 - 130	89	60 - 130	75	%		
7061635	Naphthalene	2013/08/09	89	40 - 130	88	50 - 130	<0.10	ug/L	NC	40
7061635	2-Methylnaphthalene	2013/08/09	93	40 - 130	92	50 - 130	<0.10	ug/L	NC	40
7061635	Quinoline	2013/08/09	130	40 - 130	132 (2)	50 - 130	<0.50	ug/L	NC	40
7061635	Acenaphthylene	2013/08/09	93	40 - 130	93	50 - 130	<0.050	ug/L	NC	40
7061635	Acenaphthene	2013/08/09	95	40 - 130	94	50 - 130	<0.050	ug/L	NC	40
7061635	Fluorene	2013/08/09	93	40 - 130	93	50 - 130	<0.050	ug/L	NC	40
7061635	Phenanthrene	2013/08/09	90	40 - 130	92	60 - 130	<0.050	ug/L	NC	40
7061635	Anthracene	2013/08/09	96	40 - 130	98	60 - 130	<0.010	ug/L	NC	40
7061635	Acridine	2013/08/09	80	40 - 130	82	50 - 130	<0.050	ug/L	NC	40
7061635	Fluoranthene	2013/08/09	94	40 - 130	100	60 - 130	<0.020	ug/L	NC	40
7061635	Pyrene	2013/08/09	93	40 - 130	100	60 - 130	<0.020	ug/L	NC	40
7061635	Benzo(a)anthracene	2013/08/09	74	40 - 130	91	60 - 130	<0.010	ug/L	NC	40
7061635	Chrysene	2013/08/09	73	40 - 130	90	60 - 130	<0.050	ug/L	NC	40
7061635	Benzo(b&j)fluoranthene	2013/08/09	67	40 - 130	99	60 - 130	<0.050	ug/L	NC	40
7061635	Benzo(k)fluoranthene	2013/08/09	73	40 - 130	90	60 - 130	<0.050	ug/L	NC	40
7061635	Benzo(a)pyrene	2013/08/09	70	40 - 130	97	60 - 130	<0.0090	ug/L	NC	40
7061635	Indeno(1,2,3-cd)pyrene	2013/08/09	77	40 - 130	110	60 - 130	<0.050	ug/L	NC	40
7061635	Dibenz(a,h)anthracene	2013/08/09	64	40 - 130	93	60 - 130	<0.050	ug/L	NC	40
7061635	Benzo(g,h,i)perylene	2013/08/09	74	40 - 130	106	60 - 130	<0.050	ug/L	NC	40
7061694	O-TERPHENYL (sur.)	2013/08/11	93	50 - 130	91	50 - 130	93	%		
7061694	EPH (C10-C19)	2013/08/11	121	50 - 130	125	50 - 130	<0.20	mg/L	NC	30

Maxxam Job #: B367755
 Report Date: 2013/08/20

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300 SA DENA HES
 Sampler Initials: AB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7061694	EPH (C19-C32)	2013/08/11	102	50 - 130	106	50 - 130	<0.20	mg/L	NC	30
7061764	Dissolved Sulphate (SO4)	2013/08/08	NC	80 - 120	91	80 - 120	<0.50	mg/L	0.08	20
7087731	Strong Acid Dissoc. Cyanide (CN)	2013/08/19	89	N/A	100	N/A	0.00085, RDL=0.00050	mg/L	NC	20

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.


(1) - RDL raised due to sample dilution.

(2) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Validation Signature Page

Maxxam Job #: B367755

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Andy Lu, Data Validation Coordinator



Rob Reinert, Data Validation Coordinator

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

B367755

UPDATED

CHAIN-OF-CUSTODY RECORD/ANALYSIS REQUEST

No 24324

page 1 of 1



500-4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone: 604-298-6623 Fax: 604-298-5253

Project Number: 12-1021-0006 / 7000 / 7300
Laboratory Name: MAXAM ANALYTICS
Short Title: SA DENA HES
Address: 4606 CANADA WAY BURNABY
Golder Contact: ANOREA BADGER
Golder E-mail Address: abadger@golder.com
Tel/Fax: 604.734.7276
Contact: TARETHA RUDKIN

Table with columns: Sample Control Number (SCN), Sample Location, Sa. #, Sample Depth (m), Sample Matrix (over), Date Sampled (D/M/Y), Time Sampled (HHMM), Sample Type (over), QAQC Code (over), Related SCN (over), Number of Containers, BTEX, CYANIDE, GENERAL CHEMISTRY, DISSOLVED METALS, RUSH, Remarks (over). Includes handwritten data for samples 24324-01 to 24324-07.



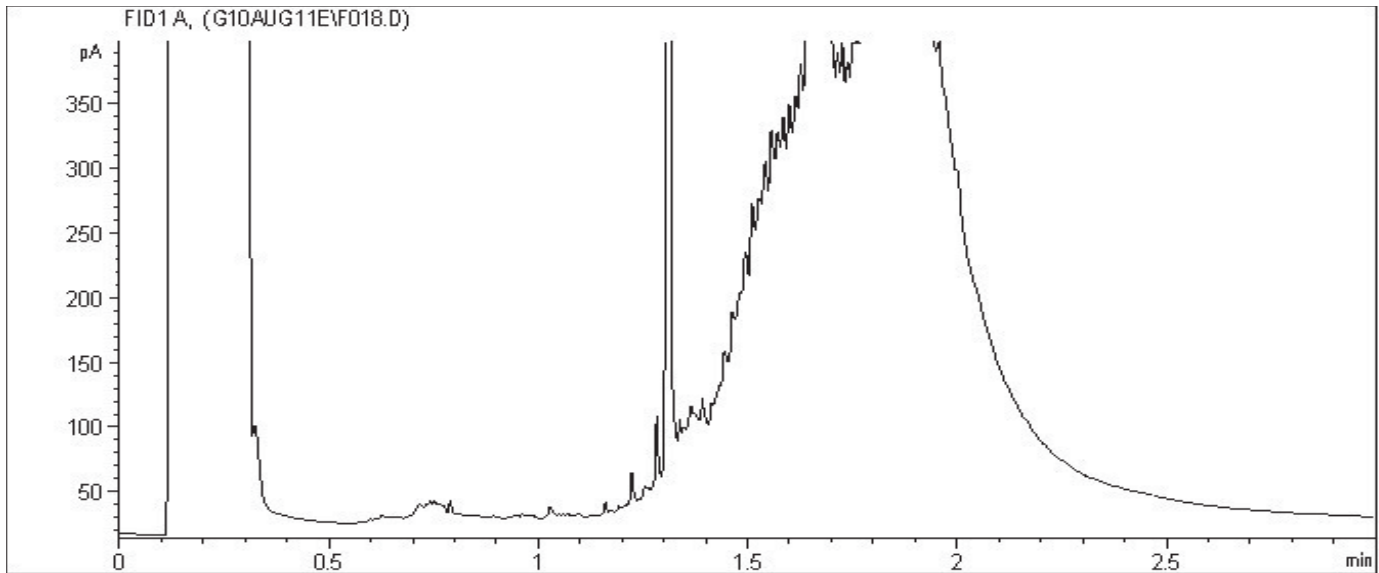
B367755

Sampler's Signature, Relinquished by: Signature, Company, Date, Time, Received by: Signature, Company, Sample Storage (°C), Relinquished by: Signature, Company, Date, Time, Received by: Signature, Company, Comments, Method of Shipment, Waybill No., Received for Lab by, Date, Time, Shipped by, Shipment Condition, Seal Intact, Temp (°C), Cooler opened by, Date, Time.

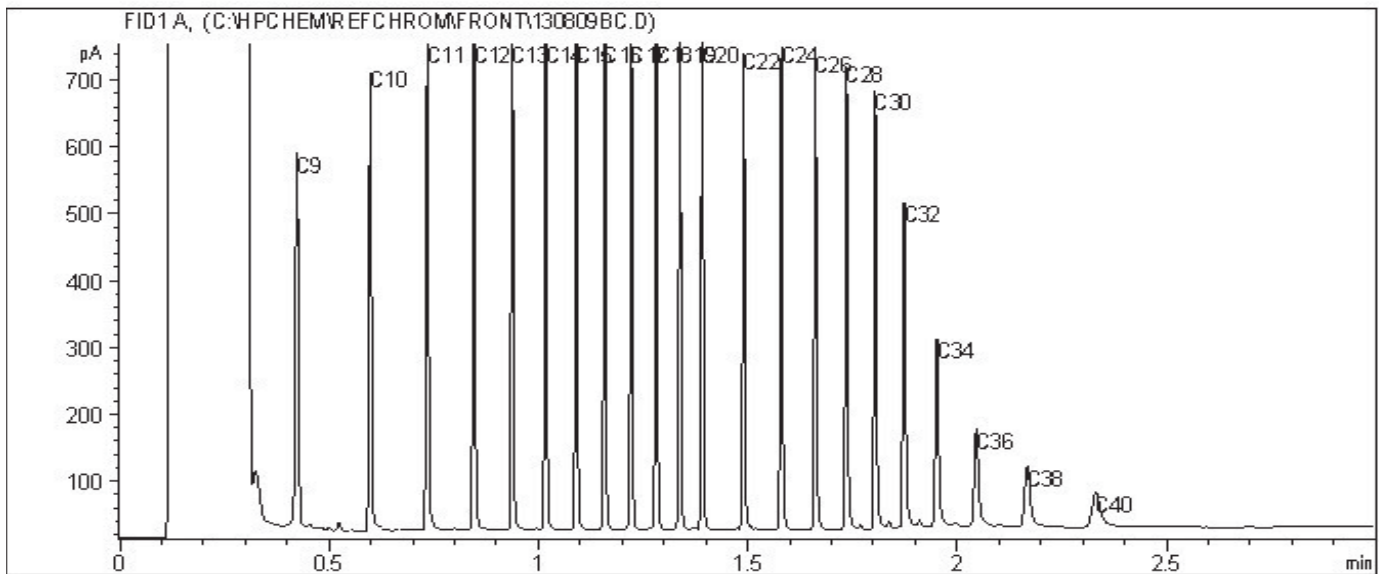
Report Date: 2013/08/20
 Maxxam Job #: B367755
 Maxxam Sample: HC5314

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300 SA DENA HES
 Client ID: 24324-01

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

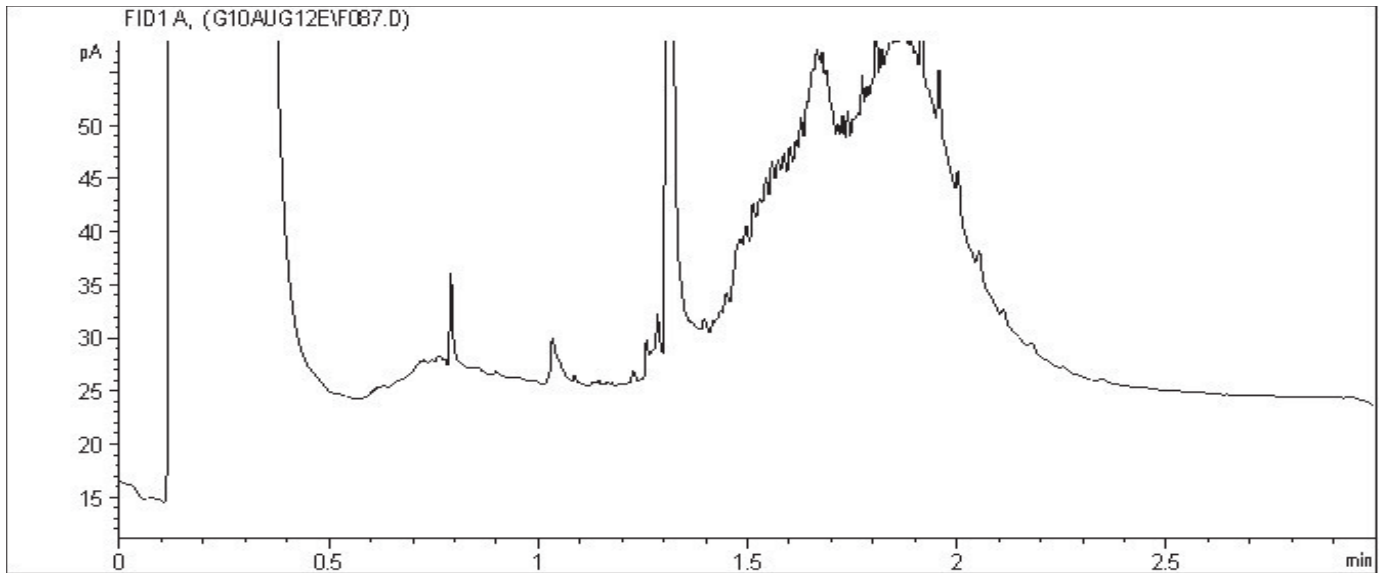
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

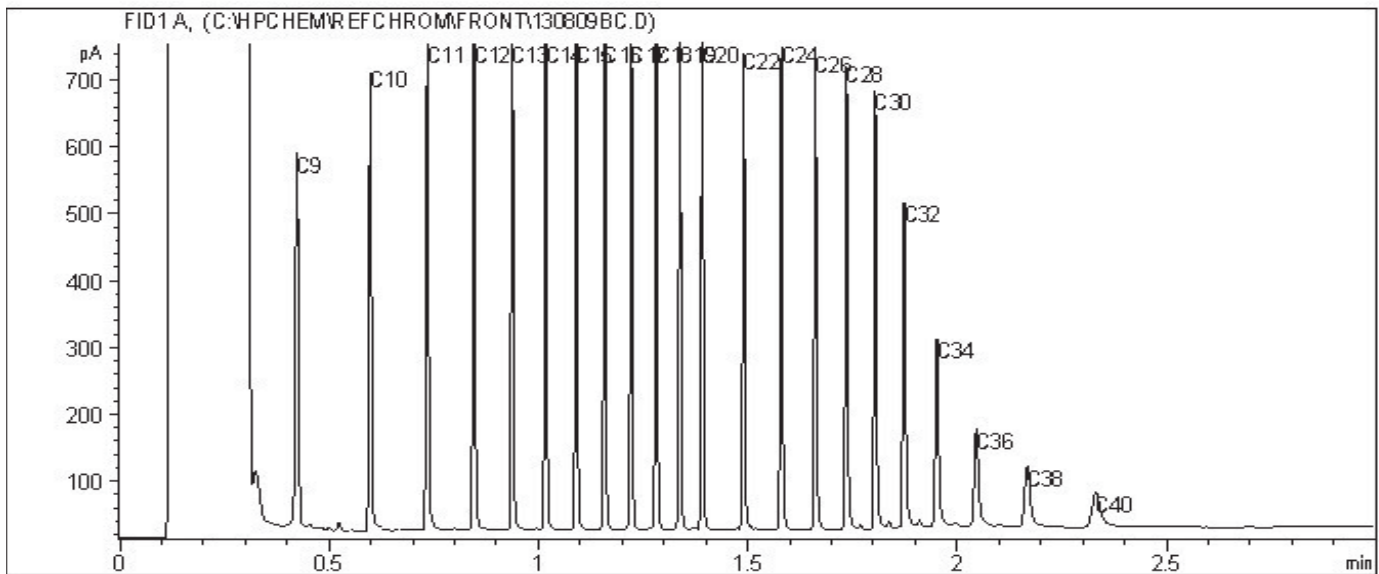
Report Date: 2013/08/20
 Maxxam Job #: B367755
 Maxxam Sample: HC5315

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300 SA DENA HES
 Client ID: 24324-02

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

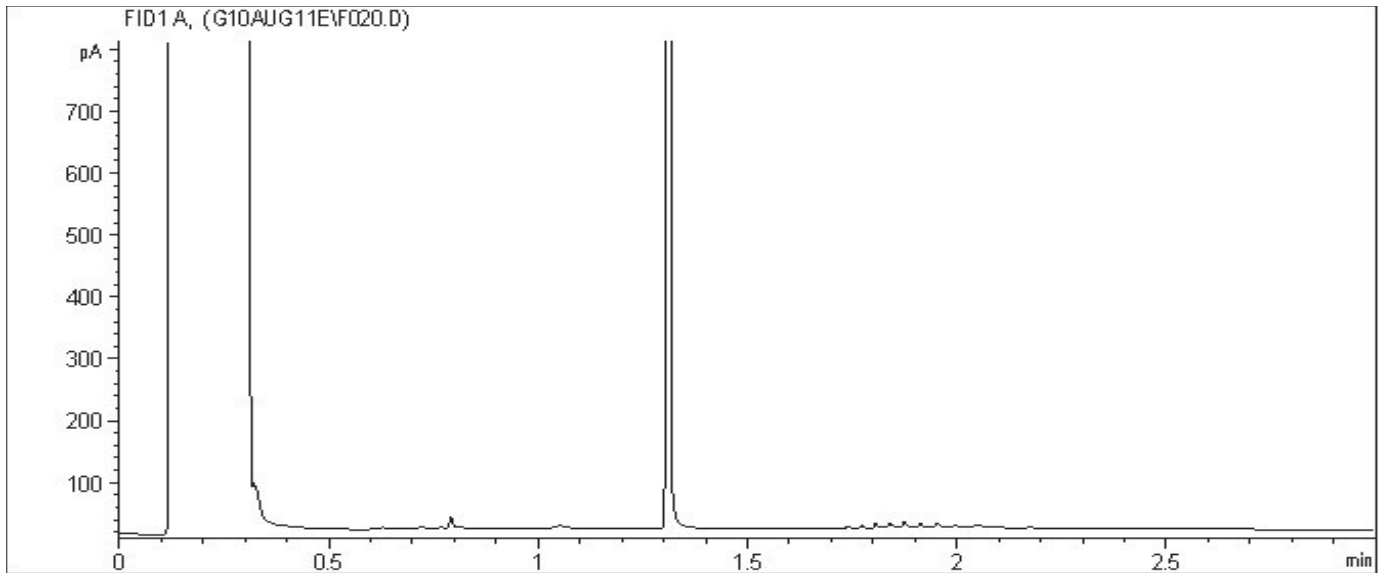
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

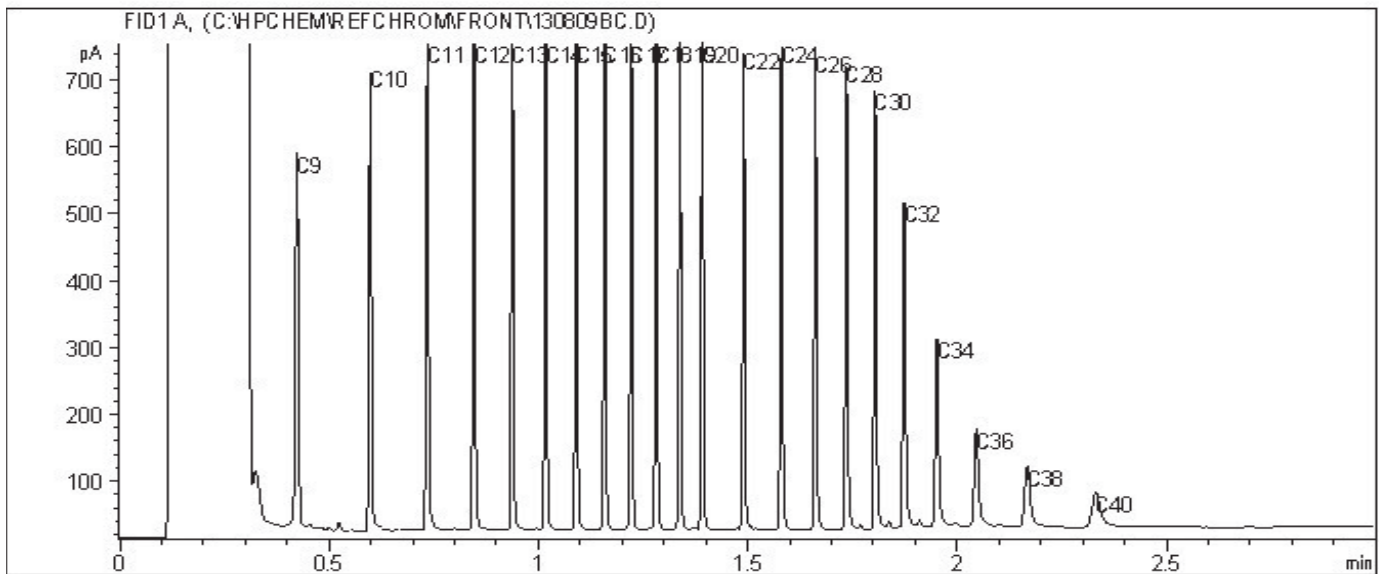
Report Date: 2013/08/20
 Maxxam Job #: B367755
 Maxxam Sample: HC5316

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300 SA DENA HES
 Client ID: 24324-03

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

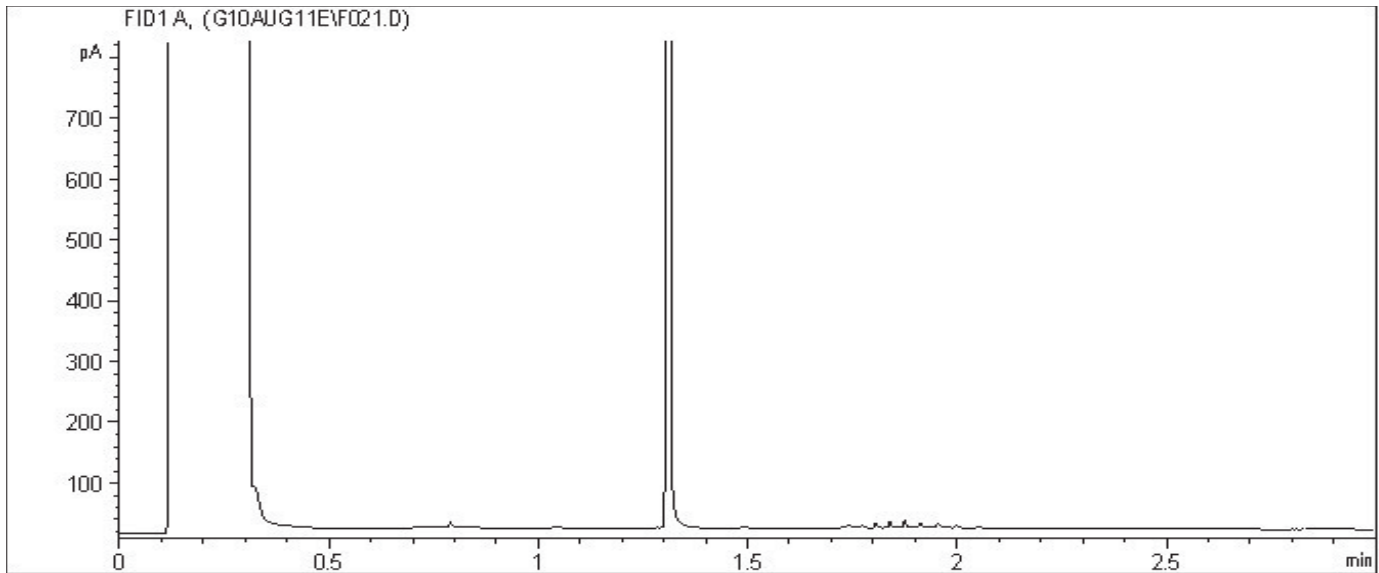
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

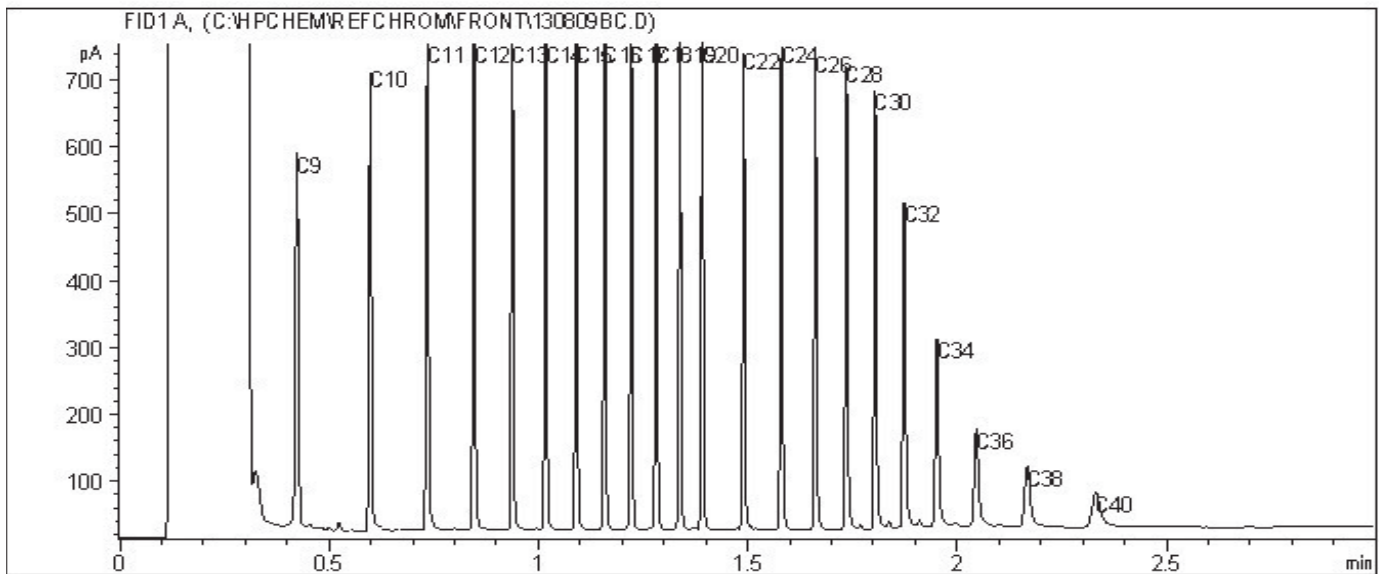
Report Date: 2013/08/20
 Maxxam Job #: B367755
 Maxxam Sample: HC5317

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300 SA DENA HES
 Client ID: 24324-04

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

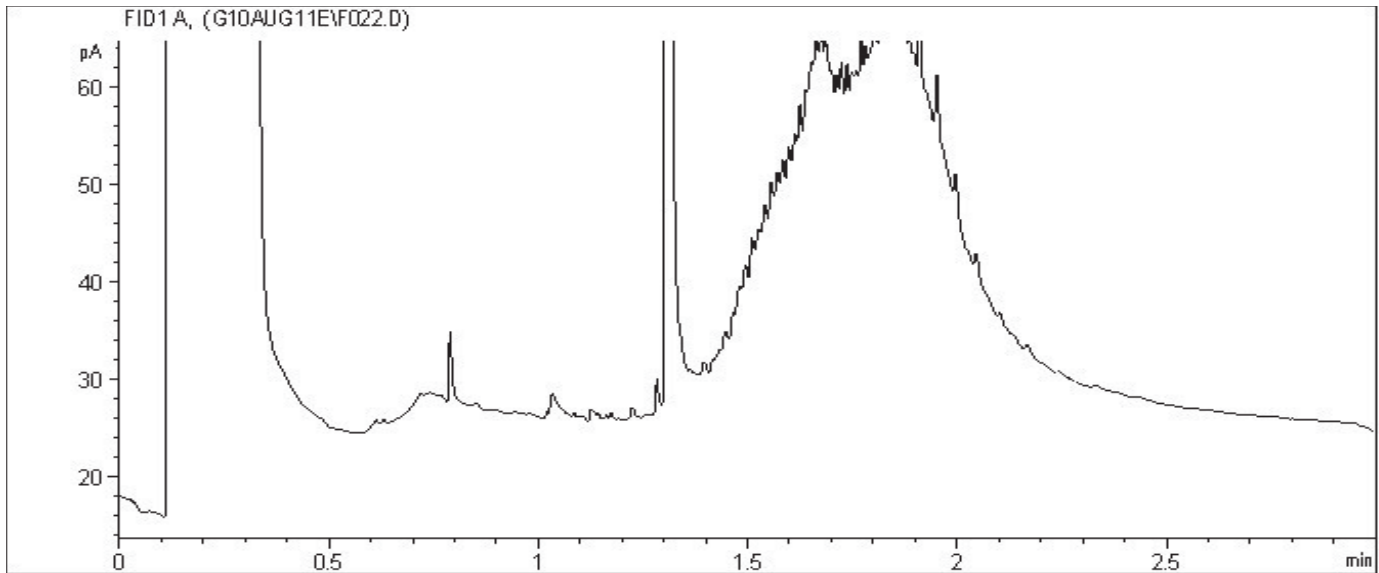
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

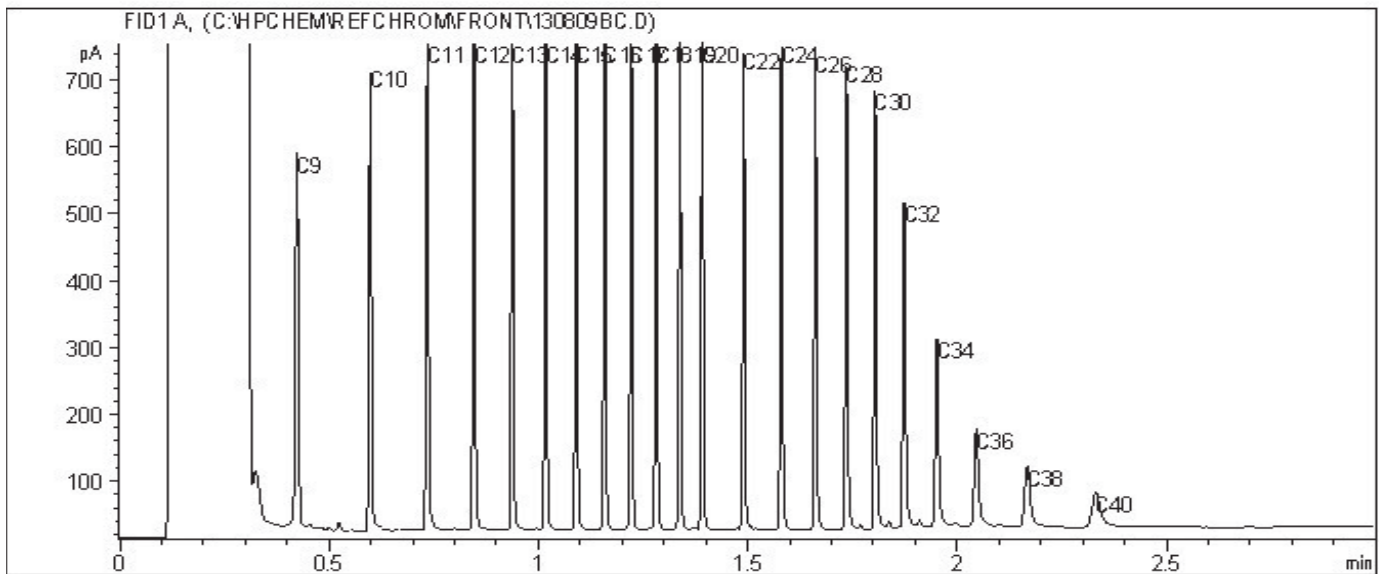
Report Date: 2013/08/20
 Maxxam Job #: B367755
 Maxxam Sample: HC5318

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300 SA DENA HES
 Client ID: 24324-05

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

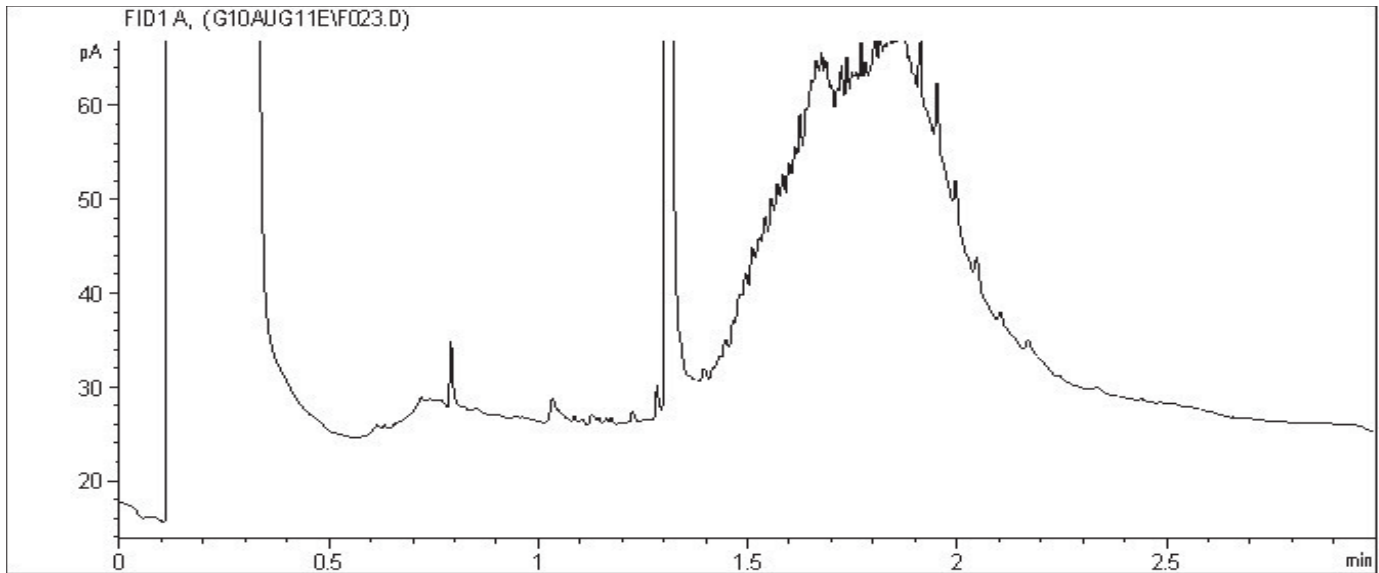
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

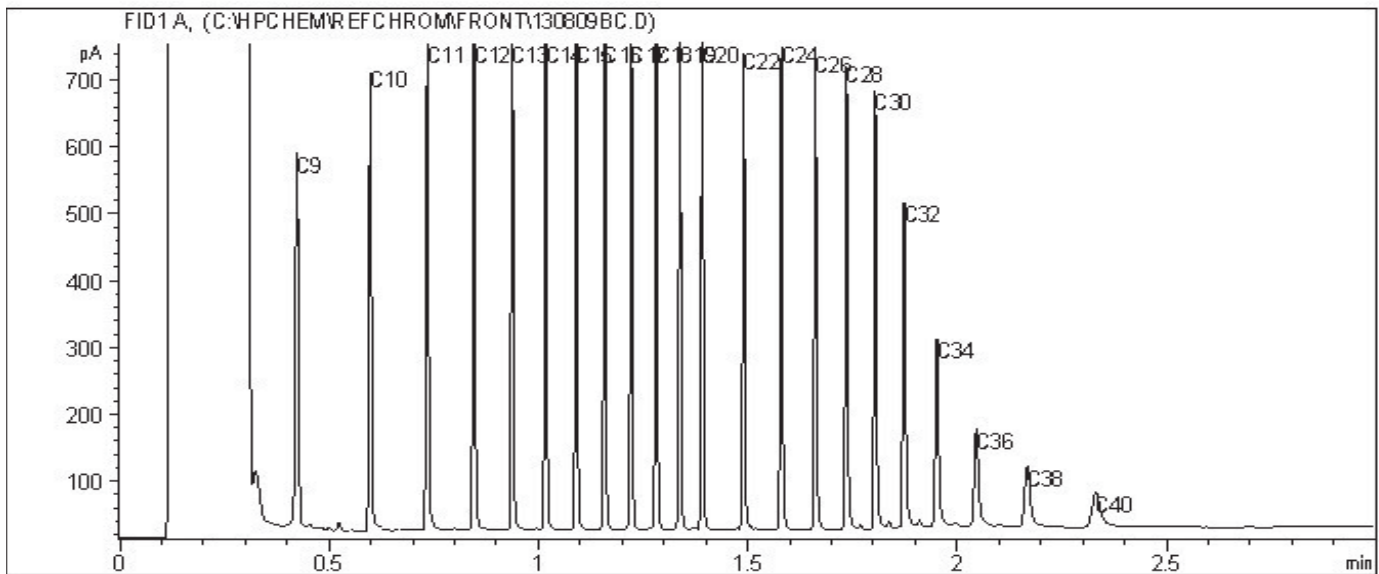
Report Date: 2013/08/20
 Maxxam Job #: B367755
 Maxxam Sample: HC5319

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300 SA DENA HES
 Client ID: 24324-06

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

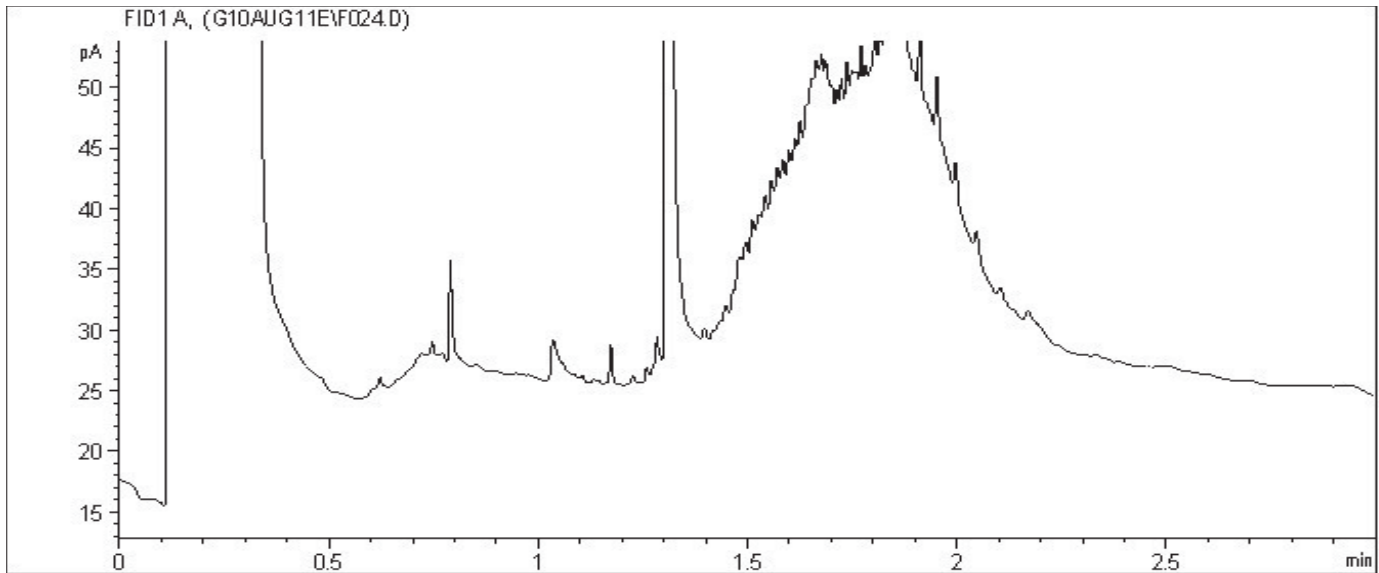
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

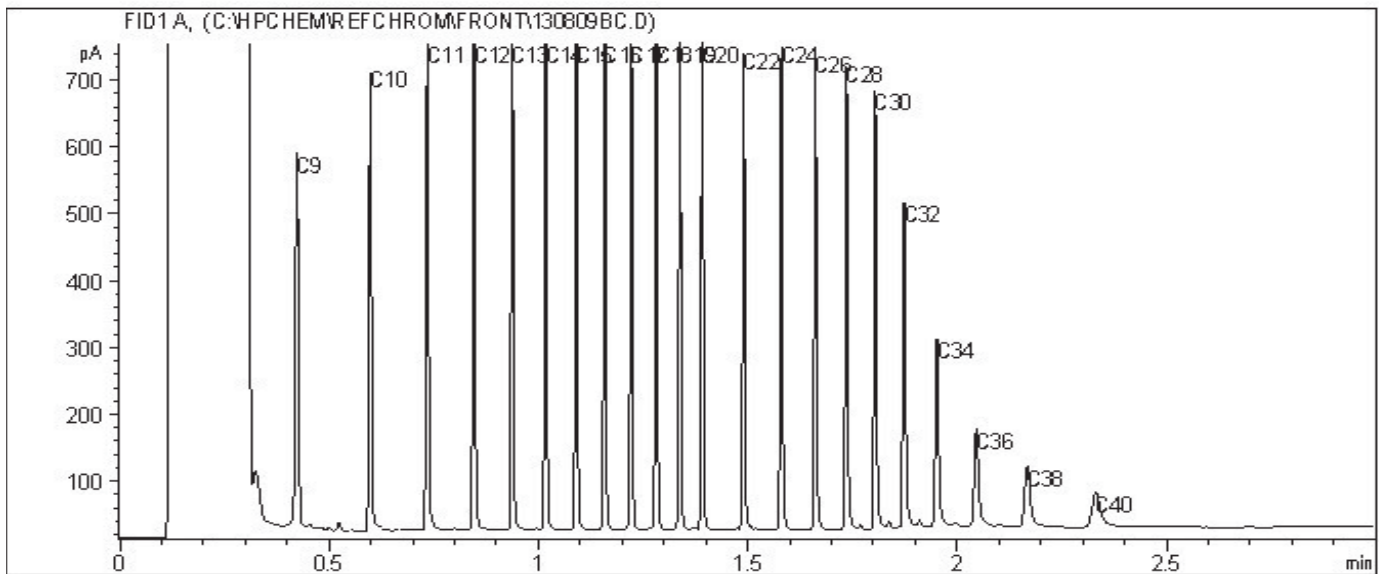
Report Date: 2013/08/20
 Maxxam Job #: B367755
 Maxxam Sample: HC5320

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300 SA DENA HES
 Client ID: 24324-07

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 12-1021-0006
 Site#: 12-1021-0006
 Site Location: PHASE 7000/7300
 Your C.O.C. #: 24336

Attention: Andrea Badger
 GOLDER ASSOCIATES LTD
 4260 STILL CREEK DRIVE
 Suite 500
 BURNABY, BC
 Canada V5C 6C6

Report Date: 2013/09/06

CERTIFICATE OF ANALYSIS

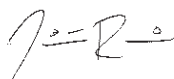
MAXXAM JOB #: B377398
Received: 2013/08/29, 13:30

Sample Matrix: Water
 # Samples Received: 9

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity - Water	9	2013/08/29	2013/08/30	BBY6SOP-00026	SM2320B
BTEX/MTBE LH, VH, F1 SIM/MS	5	2013/08/30	2013/08/30	BBY8-SOP-00010	EPA 8260C
Cyanide SAD (strong acid dissociable)	9	N/A	2013/09/05	BBY6SOP-00004	SM-4500CN I
Conductance - water	9	N/A	2013/08/30	BBY6SOP-00026	SM-2510B
Hardness (calculated as CaCO3)	9	N/A	2013/08/31	BBY7SOP-00002	EPA 6020A
Extrac. Pet HC when LEPH/HEPH required	4	2013/09/05	2013/09/05	BBY8SOP-00029	BC Env. Lab Manual
Extrac. Pet HC when LEPH/HEPH required	1	2013/09/05	2013/09/06	BBY8SOP-00029	BC Env. Lab Manual
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	9	N/A	2013/08/31	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (dissolved)	9	N/A	2013/08/30	BBY7SOP-00002	EPA 6020A
Ammonia-N (Unpreserved)	9	N/A	2013/08/30	BBY6SOP-00009	SM-4500NH3G
Nitrate + Nitrite (N)	9	N/A	2013/08/30	BBY6SOP-00010	SM 4500NO3-I
Nitrite (N) by CFA	9	N/A	2013/08/30	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	9	N/A	2013/08/31	BBY6SOP-00010	SM 4500NO3-I
PAH in Water by GC/MS (SIM)	4	2013/09/05	2013/09/05	BBY8SOP-00021	EPA 8270D
PAH in Water by GC/MS (SIM)	1	2013/09/05	2013/09/06	BBY8SOP-00021	EPA 8270D
Total LMW, HMW, Total PAH Calc	5	N/A	2013/09/06	BBY WI-00033	BC MOE Lab Method
pH Water	9	N/A	2013/08/30	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	8	N/A	2013/08/30	BBY6SOP-00017	SM4500-SO42- E
Sulphate by Automated Colourimetry	1	N/A	2013/09/03	BBY6SOP-00017	SM4500-SO42- E
Total Dissolved Solids (Filt. Residue)	9	2013/08/30	2013/09/03	BBY6SOP-00033	SM 2540C
EPH less PAH in Water by GC/FID	5	N/A	2013/09/06	BBY WI-00033	BC MOE Lab Method
Total Suspended Solids	9	N/A	2013/08/31	BBY6SOP-00034	SM - 2540 D
Turbidity	9	N/A	2013/08/31	BBY6SOP-00027	SM - 2130B

* Results relate only to the items tested.

Encryption Key



Tabitha Rudkin

06 Sep 2013 16:19:00 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Tabitha Rudkin, Burnaby Project Manager
 Email: TRudkin@maxxam.ca
 Phone# (604) 638-2639

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B377398
 Report Date: 2013/09/06

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		HI9745		HI9746		HI9747	HI9748	HI9749		
Sampling Date		2013/08/26		2013/08/26		2013/08/26	2013/08/26	2013/08/26		
	UNITS	24336-01	QC Batch	24336-02	QC Batch	24336-03	24336-04	24336-05	RDL	QC Batch
ANIONS										
Nitrite (N)	mg/L	<0.0050 ⁽¹⁾	7133432	<0.0050 ⁽¹⁾	7133432	0.0062 ⁽¹⁾	0.0081 ⁽¹⁾	<0.0050 ⁽¹⁾	0.0050	7133432
Calculated Parameters										
Nitrate (N)	mg/L	0.250	7128375	<0.020	7128375	0.111	0.117	0.089	0.020	7128375
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00090	7146693	0.00094	7146693	0.00100	0.00098	0.00096	0.00050	7146693
Alkalinity (Total as CaCO ₃)	mg/L	268	7130329	222	7130329	185	183	171	0.50	7130329
Alkalinity (PP as CaCO ₃)	mg/L	<0.50	7130329	<0.50	7130329	<0.50	<0.50	<0.50	0.50	7130329
Bicarbonate (HCO ₃)	mg/L	326	7130329	271	7130329	225	223	209	0.50	7130329
Carbonate (CO ₃)	mg/L	<0.50	7130329	<0.50	7130329	<0.50	<0.50	<0.50	0.50	7130329
Hydroxide (OH)	mg/L	<0.50	7130329	<0.50	7130329	<0.50	<0.50	<0.50	0.50	7130329
Anions										
Dissolved Sulphate (SO ₄)	mg/L	3.25	7133668	48.6	7139261	12.1	12.8	10.2	0.50	7133668
Nutrients										
Ammonia (N)	mg/L	<0.0050 ⁽¹⁾	7133049	0.155 ⁽¹⁾	7133049	0.0112 ⁽¹⁾	0.0141 ⁽¹⁾	<0.0050 ⁽¹⁾	0.0050	7133049
Nitrate plus Nitrite (N)	mg/L	0.250 ⁽¹⁾	7133388	<0.020 ⁽¹⁾	7133388	0.118 ⁽¹⁾	0.125 ⁽¹⁾	0.089 ⁽¹⁾	0.020	7133388
Physical Properties										
Conductivity	uS/cm	492	7130335	501	7130335	367	367	336	1.0	7130335
pH	pH Units	7.96	7130334	8.13	7130334	8.15	8.15	8.20		7130334
Physical Properties										
Total Suspended Solids	mg/L	230	7130822	40.5	7130822	145	148	53.5	4.0	7130822
Total Dissolved Solids	mg/L	350	7130905	302	7130905	228	242	200	10	7130905
Turbidity	NTU	277 ⁽¹⁾	7133902	23.8 ⁽¹⁾	7133902	224 ⁽¹⁾	235 ⁽¹⁾	65.5 ⁽¹⁾	0.10	7133902

RDL = Reportable Detection Limit

(1) - Sample analysed past recommended hold time.

Maxxam Job #: B377398
 Report Date: 2013/09/06

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		HI9750		HI9751		HI9752	HI9753		
Sampling Date		2013/08/27		2013/08/27		2013/08/27	2013/08/28		
	UNITS	24336-06	RDL	24336-07	RDL	24336-08	24336-09	RDL	QC Batch
ANIONS									
Nitrite (N)	mg/L	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0129	0.0050	7133432
Calculated Parameters									
Nitrate (N)	mg/L	0.041	0.020	<0.020	0.020	0.274	0.491	0.020	7128375
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00106	0.00050	0.00116	0.00050	0.00112	0.00112	0.00050	7146693
Alkalinity (Total as CaCO3)	mg/L	390	0.50	327	0.50	129	163	0.50	7130329
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	<0.50	0.50	7130329
Bicarbonate (HCO3)	mg/L	476	0.50	399	0.50	158	199	0.50	7130329
Carbonate (CO3)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	<0.50	0.50	7130329
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	<0.50	0.50	7130329
Anions									
Dissolved Sulphate (SO4)	mg/L	52.1	0.50	389	5.0	8.28	47.9	0.50	7133668
Nutrients									
Ammonia (N)	mg/L	<0.0050	0.0050	0.777	0.0050	<0.0050	<0.0050	0.0050	7133049
Nitrate plus Nitrite (N)	mg/L	0.041	0.020	<0.020	0.020	0.274	0.504	0.020	7133388
Physical Properties									
Conductivity	uS/cm	771	1.0	1280	1.0	260	420	1.0	7130335
pH	pH Units	8.04		7.80		8.15	8.16		7130334
Physical Properties									
Total Suspended Solids	mg/L	1290	4.0	1130	4.0	59.3	1830	4.0	7130822
Total Dissolved Solids	mg/L	480	10	942	10	186	282	10	7130905
Turbidity	NTU	1340 ⁽¹⁾	0.10	624 ⁽¹⁾	0.10	70.1 ⁽¹⁾	2230	0.10	7133902

RDL = Reportable Detection Limit

(1) - Sample analysed past recommended hold time.



Maxxam Job #: B377398
Report Date: 2013/09/06

GOLDER ASSOCIATES LTD
Client Project #: 12-1021-0006
Site Location: PHASE 7000/7300
Sampler Initials: AB

BCCSR BTEX/VPH IN WATER (WATER)

Maxxam ID		HI9745	HI9747	HI9748	HI9749	HI9753		
Sampling Date		2013/08/26	2013/08/26	2013/08/26	2013/08/26	2013/08/28		
	UNITS	24336-01	24336-03	24336-04	24336-05	24336-09	RDL	QC Batch
Volatiles								
Methyl-tert-butylether (MTBE)	ug/L	<4.0	<4.0	<4.0	<4.0	<4.0	4.0	7131396
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7131396
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7131396
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7131396
m & p-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7131396
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7131396
Styrene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7131396
Xylenes (Total)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7131396
VH C6-C10	ug/L	<300	<300	<300	<300	<300	300	7131396
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	102	103	103	103		7131396
4-BROMOFLUOROBENZENE (sur.)	%	94	94	95	99	95		7131396
D4-1,2-DICHLOROETHANE (sur.)	%	105	103	105	104	104		7131396

RDL = Reportable Detection Limit

Maxxam Job #: B377398
 Report Date: 2013/09/06

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

LEPH & HEPH FOR CSR IN WATER (WATER)

Maxxam ID		HI9745	HI9747	HI9748	HI9749	HI9753		
Sampling Date		2013/08/26	2013/08/26	2013/08/26	2013/08/26	2013/08/28		
	UNITS	24336-01	24336-03	24336-04	24336-05	24336-09	RDL	QC Batch
Polycyclic Aromatics								
Low Molecular Weight PAH's	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7128376
High Molecular Weight PAH's	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7128376
Total PAH	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7128376
Naphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7144497
2-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7144497
Quinoline	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7144497
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Phenanthrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7144497
Acridine	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Fluoranthene	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7144497
Pyrene	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7144497
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7144497
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Benzo(b&j)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Benzo(a)pyrene	ug/L	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	0.0090	7144497
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7144497
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	112	105	105	111	110		7144497
D8-ACENAPHTHYLENE (sur.)	%	101	103	100	102	108		7144497
D8-NAPHTHALENE (sur.)	%	100	101	97	100	105		7144497
D9-Acridine	%	76	89	89	89	70		7144497
TERPHENYL-D14 (sur.)	%	92	88	84	91	90		7144497
Calculated Parameters								
LEPH (C10-C19 less PAH)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7130229
HEPH (C19-C32 less PAH)	mg/L	<0.20	<0.20	<0.20	<0.20	0.33	0.20	7130229
Ext. Pet. Hydrocarbon								
EPH (C10-C19)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7144541
EPH (C19-C32)	mg/L	<0.20	<0.20	<0.20	<0.20	0.33	0.20	7144541
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	104	106	104	104	103		7144541

RDL = Reportable Detection Limit

Maxxam Job #: B377398
 Report Date: 2013/09/06

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

CSR DISSOLVED METALS IN WATER (WATER)

Maxxam ID		HI9745	HI9746	HI9747		
Sampling Date		2013/08/26	2013/08/26	2013/08/26		
	UNITS	24336-01	24336-02	24336-03	RDL	QC Batch
Misc. Inorganics						
Dissolved Hardness (CaCO3)	mg/L	290	254	194	0.50	7127641
Dissolved Metals by ICPMS						
Dissolved Aluminum (Al)	mg/L	<0.0030	0.0081	<0.0030	0.0030	7132195
Dissolved Antimony (Sb)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	7132195
Dissolved Arsenic (As)	mg/L	0.00034	0.00119	0.00055	0.00010	7132195
Dissolved Barium (Ba)	mg/L	0.201	0.0343	0.0615	0.0010	7132195
Dissolved Beryllium (Be)	mg/L	<0.00010	<0.00010	<0.00010	0.00010	7132195
Dissolved Bismuth (Bi)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7132195
Dissolved Boron (B)	mg/L	<0.050	<0.050	<0.050	0.050	7132195
Dissolved Cadmium (Cd)	mg/L	0.000047	0.000038	<0.000010	0.000010	7132195
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7132195
Dissolved Cobalt (Co)	mg/L	<0.00050	0.00085	0.00054	0.00050	7132195
Dissolved Copper (Cu)	mg/L	<0.00020	<0.00020	0.00022	0.00020	7132195
Dissolved Iron (Fe)	mg/L	0.0663	0.0740	0.346	0.0050	7132195
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	<0.00020	0.00020	7132195
Dissolved Lithium (Li)	mg/L	<0.0050	0.0090	<0.0050	0.0050	7132195
Dissolved Manganese (Mn)	mg/L	0.0493	0.146	0.113	0.0010	7132195
Dissolved Mercury (Hg)	mg/L	<0.000050	<0.000050	<0.000050	0.000050	7132195
Dissolved Molybdenum (Mo)	mg/L	0.0019	0.0030	0.0029	0.0010	7132195
Dissolved Nickel (Ni)	mg/L	0.0016	0.0036	0.0079	0.0010	7132195
Dissolved Selenium (Se)	mg/L	0.00058	<0.00010	0.00067	0.00010	7132195
Dissolved Silicon (Si)	mg/L	4.91	7.78	3.51	0.10	7132195
Dissolved Silver (Ag)	mg/L	<0.000020	<0.000020	<0.000020	0.000020	7132195
Dissolved Strontium (Sr)	mg/L	0.303	0.480	0.220	0.0010	7132195
Dissolved Thallium (Tl)	mg/L	<0.000050	<0.000050	<0.000050	0.000050	7132195
Dissolved Tin (Sn)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7132195
Dissolved Titanium (Ti)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7132195
Dissolved Uranium (U)	mg/L	0.00175	0.00483	0.00158	0.00010	7132195
Dissolved Vanadium (V)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7132195
Dissolved Zinc (Zn)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7132195
Dissolved Zirconium (Zr)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	7132195
Dissolved Calcium (Ca)	mg/L	94.4	73.3	64.5	0.050	7128265
Dissolved Magnesium (Mg)	mg/L	13.2	17.1	7.99	0.050	7128265
Dissolved Potassium (K)	mg/L	0.641	2.87	0.541	0.050	7128265
Dissolved Sodium (Na)	mg/L	1.14	5.39	1.11	0.050	7128265
Dissolved Sulphur (S)	mg/L	<3.0	17.5	4.4	3.0	7128265

RDL = Reportable Detection Limit

Maxxam Job #: B377398
 Report Date: 2013/09/06

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

CSR DISSOLVED METALS IN WATER (WATER)

Maxxam ID		HI9748		HI9749	HI9750	HI9751	HI9752	HI9753		
Sampling Date		2013/08/26		2013/08/26	2013/08/27	2013/08/27	2013/08/27	2013/08/28		
	UNITS	24336-04	QC Batch	24336-05	24336-06	24336-07	24336-08	24336-09	RDL	QC Batch
Misc. Inorganics										
Dissolved Hardness (CaCO ₃)	mg/L	189	7127641	179	404	784	131	201	0.50	7130228
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	mg/L	<0.0030	7132195	<0.0030	0.0051	0.0090	0.0046	0.0055	0.0030	7132195
Dissolved Antimony (Sb)	mg/L	<0.00050	7132195	<0.00050	0.00061	0.00183	<0.00050	0.00092	0.00050	7132195
Dissolved Arsenic (As)	mg/L	0.00055	7132195	0.00044	0.00037	0.00113	0.00026	0.00026	0.00010	7132195
Dissolved Barium (Ba)	mg/L	0.0615	7132195	0.0704	0.0284	0.0226	0.0268	0.0160	0.0010	7132195
Dissolved Beryllium (Be)	mg/L	<0.00010	7132195	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7132195
Dissolved Bismuth (Bi)	mg/L	<0.0010	7132195	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7132195
Dissolved Boron (B)	mg/L	<0.050	7132195	<0.050	<0.050	0.095	<0.050	<0.050	0.050	7132195
Dissolved Cadmium (Cd)	mg/L	<0.000010	7132195	<0.000010	0.000050	0.000411	0.000090	0.000192	0.000010	7132195
Dissolved Chromium (Cr)	mg/L	<0.0010	7132195	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7132195
Dissolved Cobalt (Co)	mg/L	0.00054	7132195	0.00057	0.00129	0.0169	<0.00050	0.00058	0.00050	7132195
Dissolved Copper (Cu)	mg/L	<0.00020	7132195	<0.00020	0.00039	0.00074	0.00037	0.00045	0.00020	7132195
Dissolved Iron (Fe)	mg/L	0.344	7132195	1.16	0.0086	0.236	<0.0050	0.0188	0.0050	7132195
Dissolved Lead (Pb)	mg/L	<0.00020	7132195	<0.00020	<0.00020	<0.00020	0.00025	0.00092	0.00020	7132195
Dissolved Lithium (Li)	mg/L	<0.0050	7132195	<0.0050	0.0085	0.0251	<0.0050	<0.0050	0.0050	7132195
Dissolved Manganese (Mn)	mg/L	0.114	7132195	0.123	0.130	2.85	0.0358	0.0555	0.0010	7132195
Dissolved Mercury (Hg)	mg/L	<0.000050	7132195	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	7132195
Dissolved Molybdenum (Mo)	mg/L	0.0029	7132195	0.0030	<0.0010	0.0015	<0.0010	0.0011	0.0010	7132195
Dissolved Nickel (Ni)	mg/L	0.0080	7132195	0.0028	0.0047	0.0648	<0.0010	0.0049	0.0010	7132195
Dissolved Selenium (Se)	mg/L	0.00054	7132195	0.00057	0.00146	0.00046	0.00109	0.00126	0.00010	7132195
Dissolved Silicon (Si)	mg/L	3.58	7132195	3.57	2.96	7.69	4.19	4.12	0.10	7132195
Dissolved Silver (Ag)	mg/L	<0.000020	7132195	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	7132195
Dissolved Strontium (Sr)	mg/L	0.234	7132195	0.215	0.433	1.18	0.108	0.358	0.0010	7132195
Dissolved Thallium (Tl)	mg/L	<0.000050	7132195	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	7132195
Dissolved Tin (Sn)	mg/L	<0.0050	7132195	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7132195
Dissolved Titanium (Ti)	mg/L	<0.0050	7132195	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7132195
Dissolved Uranium (U)	mg/L	0.00159	7132195	0.00107	0.00167	0.00320	0.00054	0.00227	0.00010	7132195
Dissolved Vanadium (V)	mg/L	<0.0050	7132195	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7132195
Dissolved Zinc (Zn)	mg/L	<0.0050	7132195	<0.0050	<0.0050	0.0072	<0.0050	0.0088	0.0050	7132195
Dissolved Zirconium (Zr)	mg/L	<0.00050	7132195	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	7132195
Dissolved Calcium (Ca)	mg/L	62.9	7128265	60.1	67.9	197	47.0	71.1	0.050	7128265
Dissolved Magnesium (Mg)	mg/L	7.83	7128265	7.01	56.9	71.2	3.29	5.75	0.050	7128265
Dissolved Potassium (K)	mg/L	0.536	7128265	0.476	0.840	3.13	0.477	1.22	0.050	7128265
Dissolved Sodium (Na)	mg/L	1.16	7128265	1.06	13.6	9.31	1.54	2.86	0.050	7128265
Dissolved Sulphur (S)	mg/L	4.4	7128265	4.0	17.5	165	<3.0	15.6	3.0	7128265

RDL = Reportable Detection Limit

Maxxam Job #: B377398
Report Date: 2013/09/06

GOLDER ASSOCIATES LTD
Client Project #: 12-1021-0006
Site Location: PHASE 7000/7300
Sampler Initials: AB

General Comments

Sample HI9745-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9746-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9747-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9748-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9749-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9750-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9751-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9752-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Sample HI9753-01: The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Maxxam Job #: B377398
 Report Date: 2013/09/06

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7130329	Alkalinity (Total as CaCO3)	2013/08/30	97	80 - 120	102	80 - 120	<0.50	mg/L	1.4	20
7130329	Alkalinity (PP as CaCO3)	2013/08/30					<0.50	mg/L	NC	20
7130329	Bicarbonate (HCO3)	2013/08/30					<0.50	mg/L	1.4	20
7130329	Carbonate (CO3)	2013/08/30					<0.50	mg/L	NC	20
7130329	Hydroxide (OH)	2013/08/30					<0.50	mg/L	NC	20
7130335	Conductivity	2013/08/30			100	80 - 120	<1.0	uS/cm	1.4	20
7130822	Total Suspended Solids	2013/08/31	110	80 - 120	102	80 - 120	<4.0	mg/L	3.6	20
7130905	Total Dissolved Solids	2013/09/03	NC	80 - 120	98	80 - 120	<10	mg/L	1.5	20
7131396	1,4-Difluorobenzene (sur.)	2013/08/30	103	70 - 130	102	70 - 130	103	%		
7131396	4-BROMOFLUOROBENZENE (sur.)	2013/08/30	99	70 - 130	99	70 - 130	95	%		
7131396	D4-1,2-DICHLOROETHANE (sur.)	2013/08/30	99	70 - 130	101	70 - 130	101	%		
7131396	Methyl-tert-butylether(MTBE)	2013/08/30	111	70 - 130	115	70 - 130	<4.0	ug/L	NC	30
7131396	Benzene	2013/08/30	102	70 - 130	104	70 - 130	<0.40	ug/L	NC	30
7131396	Toluene	2013/08/30	98	70 - 130	102	70 - 130	<0.40	ug/L	NC	30
7131396	Ethylbenzene	2013/08/30	100	70 - 130	102	70 - 130	<0.40	ug/L	NC	30
7131396	m & p-Xylene	2013/08/30	100	70 - 130	102	70 - 130	<0.40	ug/L	1.5	30
7131396	o-Xylene	2013/08/30	103	70 - 130	106	70 - 130	<0.40	ug/L	NC	30
7131396	Styrene	2013/08/30	112	70 - 130	116	70 - 130	<0.40	ug/L	NC	30
7131396	VH C6-C10	2013/08/30			102	70 - 130	<300	ug/L	NC	30
7131396	Xylenes (Total)	2013/08/30					<0.40	ug/L	2.3	30
7132195	Dissolved Aluminum (Al)	2013/08/30	107	80 - 120	108	80 - 120	<0.0030	mg/L	NC	20
7132195	Dissolved Antimony (Sb)	2013/08/30	NC	80 - 120	105	80 - 120	<0.00050	mg/L	NC	20
7132195	Dissolved Arsenic (As)	2013/08/30	99	80 - 120	97	80 - 120	<0.00010	mg/L	NC	20
7132195	Dissolved Barium (Ba)	2013/08/30	NC	80 - 120	106	80 - 120	<0.0010	mg/L	0.3	20
7132195	Dissolved Beryllium (Be)	2013/08/30	101	80 - 120	101	80 - 120	<0.00010	mg/L	NC	20
7132195	Dissolved Bismuth (Bi)	2013/08/30	98	80 - 120	105	80 - 120	<0.0010	mg/L	NC	20
7132195	Dissolved Cadmium (Cd)	2013/08/30	104	80 - 120	106	80 - 120	<0.000010	mg/L	3.7	20
7132195	Dissolved Chromium (Cr)	2013/08/30	95	80 - 120	99	80 - 120	<0.0010	mg/L	NC	20
7132195	Dissolved Cobalt (Co)	2013/08/30	94	80 - 120	97	80 - 120	<0.00050	mg/L	NC	20
7132195	Dissolved Copper (Cu)	2013/08/30	93	80 - 120	95	80 - 120	<0.00020	mg/L	NC	20
7132195	Dissolved Iron (Fe)	2013/08/30	101	80 - 120	107	80 - 120	<0.0050	mg/L	NC	20
7132195	Dissolved Lead (Pb)	2013/08/30	97	80 - 120	103	80 - 120	<0.00020	mg/L	NC	20
7132195	Dissolved Lithium (Li)	2013/08/30	87	80 - 120	96	80 - 120	<0.0050	mg/L	NC	20
7132195	Dissolved Manganese (Mn)	2013/08/30	NC	80 - 120	97	80 - 120	<0.0010	mg/L	1	20
7132195	Dissolved Mercury (Hg)	2013/08/30	112	80 - 120	104	80 - 120	<0.000050	mg/L	NC	20
7132195	Dissolved Molybdenum (Mo)	2013/08/30	NC	80 - 120	112	80 - 120	<0.0010	mg/L	NC	20
7132195	Dissolved Nickel (Ni)	2013/08/30	93	80 - 120	100	80 - 120	<0.0010	mg/L	NC	20
7132195	Dissolved Selenium (Se)	2013/08/30	106	80 - 120	107	80 - 120	<0.00010	mg/L	0.8	20
7132195	Dissolved Silver (Ag)	2013/08/30	101	80 - 120	85	80 - 120	<0.000020	mg/L	NC	20
7132195	Dissolved Strontium (Sr)	2013/08/30	NC	80 - 120	104	80 - 120	<0.0010	mg/L	0.6	20

Maxxam Job #: B377398
 Report Date: 2013/09/06

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7132195	Dissolved Thallium (Tl)	2013/08/30	97	80 - 120	106	80 - 120	<0.000050	mg/L	NC	20
7132195	Dissolved Tin (Sn)	2013/08/30	104	80 - 120	104	80 - 120	<0.0050	mg/L	NC	20
7132195	Dissolved Titanium (Ti)	2013/08/30	98	80 - 120	103	80 - 120	<0.0050	mg/L	NC	20
7132195	Dissolved Uranium (U)	2013/08/30	100	80 - 120	103	80 - 120	<0.00010	mg/L	0.8	20
7132195	Dissolved Vanadium (V)	2013/08/30	94	80 - 120	96	80 - 120	<0.0050	mg/L	NC	20
7132195	Dissolved Zinc (Zn)	2013/08/30	NC	80 - 120	101	80 - 120	<0.0050	mg/L	NC	20
7132195	Dissolved Boron (B)	2013/08/30					<0.050	mg/L	NC	20
7132195	Dissolved Silicon (Si)	2013/08/30					<0.10	mg/L	8.3	20
7132195	Dissolved Zirconium (Zr)	2013/08/30					<0.00050	mg/L	NC	20
7133049	Ammonia (N)	2013/08/30	99	80 - 120	100	80 - 120	<0.0050	mg/L	NC	20
7133388	Nitrate plus Nitrite (N)	2013/08/30	103	80 - 120	100	80 - 120	<0.020	mg/L	NC	25
7133432	Nitrite (N)	2013/08/30	100	80 - 120	97	80 - 120	<0.0050	mg/L	NC	20
7133668	Dissolved Sulphate (SO4)	2013/08/30	NC	80 - 120	102	80 - 120	0.64, RDL=0.50	mg/L	NC	20
7133902	Turbidity	2013/08/31			98	80 - 120	<0.10	NTU	NC	20
7139261	Dissolved Sulphate (SO4)	2013/09/03	NC	80 - 120	94	80 - 120	<0.50	mg/L	2.5	20
7144497	D10-ANTHRACENE (sur.)	2013/09/05	105	60 - 130	114	60 - 130	121	%		
7144497	D8-ACENAPHTHYLENE (sur.)	2013/09/05	99	50 - 130	105	50 - 130	110	%		
7144497	D8-NAPHTHALENE (sur.)	2013/09/05	92	50 - 130	101	50 - 130	109	%		
7144497	D9-Acridine	2013/09/05	89	50 - 130	91	50 - 130	97	%		
7144497	TERPHENYL-D14 (sur.)	2013/09/05	93	60 - 130	110	60 - 130	117	%		
7144497	Naphthalene	2013/09/05	84	50 - 130	78	50 - 130	<0.10	ug/L	NC	40
7144497	2-Methylnaphthalene	2013/09/05	87	50 - 130	78	50 - 130	<0.10	ug/L	NC	40
7144497	Quinoline	2013/09/05	110	50 - 130	93	50 - 130	<0.50	ug/L	NC	40
7144497	Acenaphthylene	2013/09/05	89	50 - 130	80	50 - 130	<0.050	ug/L	NC	40
7144497	Acenaphthene	2013/09/05	90	50 - 130	80	50 - 130	<0.050	ug/L	NC	40
7144497	Fluorene	2013/09/05	90	50 - 130	80	50 - 130	<0.050	ug/L	NC	40
7144497	Phenanthrene	2013/09/05	90	60 - 130	80	60 - 130	<0.050	ug/L	NC	40
7144497	Anthracene	2013/09/05	92	60 - 130	85	60 - 130	<0.010	ug/L	NC	40
7144497	Acridine	2013/09/05	80	50 - 130	70	50 - 130	<0.050	ug/L	NC	40
7144497	Fluoranthene	2013/09/05	91	60 - 130	83	60 - 130	<0.020	ug/L	NC	40
7144497	Pyrene	2013/09/05	93	60 - 130	85	60 - 130	<0.020	ug/L	NC	40
7144497	Benzo(a)anthracene	2013/09/05	87	60 - 130	82	60 - 130	<0.010	ug/L	NC	40
7144497	Chrysene	2013/09/05	87	60 - 130	83	60 - 130	<0.050	ug/L	NC	40
7144497	Benzo(b&i)fluoranthene	2013/09/05	90	60 - 130	82	60 - 130	<0.050	ug/L	NC	40
7144497	Benzo(k)fluoranthene	2013/09/05	93	60 - 130	89	60 - 130	<0.050	ug/L	NC	40
7144497	Benzo(a)pyrene	2013/09/05	89	60 - 130	83	60 - 130	<0.0090	ug/L	NC	40
7144497	Indeno(1,2,3-cd)pyrene	2013/09/05	91	60 - 130	84	60 - 130	<0.050	ug/L	NC	40
7144497	Dibenz(a,h)anthracene	2013/09/05	88	60 - 130	80	60 - 130	<0.050	ug/L	NC	40
7144497	Benzo(g,h,i)perylene	2013/09/05	88	60 - 130	82	60 - 130	<0.050	ug/L	NC	40
7144541	O-TERPHENYL (sur.)	2013/09/05	101	50 - 130	105	50 - 130	104	%		

Maxxam Job #: B377398
 Report Date: 2013/09/06

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: AB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7144541	EPH (C10-C19)	2013/09/05	98	50 - 130	121	50 - 130	<0.20	mg/L	NC	30
7144541	EPH (C19-C32)	2013/09/05	86	50 - 130	107	50 - 130	<0.20	mg/L	NC	30
7146693	Strong Acid Dissoc. Cyanide (CN)	2013/09/05	98	N/A	99	N/A	<0.00050	mg/L	NC	20

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

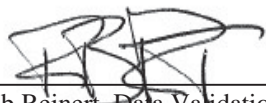
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B377398

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Rob Reinert, Data Validation Coordinator

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



CHAIN-OF-CUSTODY RECORD/ANALYSIS REQUEST

B377398

NO 24336 Page 1 of 1

500-4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone: 604-298-6623 Fax: 604-298-5253

Project Number: 12-102-0006/7000/7300		Laboratory Name: MAXXAM	
Golder Contact: ANDREA BODGES		Address: CANADA WAY, BURNABY	
Golder E-mail Address: abodges@golder.com		Contact: MBEENA RUDKEN	

Office the final reports should be sent to:

- 500-4260 Still Creek Drive
Burnaby, BC V5C 6C6
Tel: 604-298-6623
Fax: 604-298-5253
- 202-2790 Gladwin Road
Abbotsford, BC V2T 4S8
Tel: 604-850-8786
Fax: 604-850-8756
- 2640 Douglas Street
Victoria, BC V8T 4M1
Tel: 250-881-7372
Fax: 250-881-7470

TARAA REYNOLDS + reynolds

Analyses Required

Sample Control Number (SCN)	Sample Matrix (over)	Date Sampled (D/M/Y)	Number of Containers	Analyses Required					RUSH	Remarks (over)
				BTEX	LEAD/HEP/PAH	CYANIDE	DISSOLVED METALS	GENERAL		
24336 -01	GW	20/08/13	8	X	X	X	X	X		HI9745
-02		24/08/13	3			X	X	X		HI9746
-03			8	X	X	X	X	X		HI9747
-04			8	X	X	X	X	X		HI9748
-05			8	X	X	X	X	X		HI9749
-06		27/08/13	3			X	X	X		HI9750
-07			3			X	X	X		HI9751
-08			3			X	X	X		HI9752
-09		28/08/13	8	X	X	X	X	X		HI9753
-10										
-11										
-12										



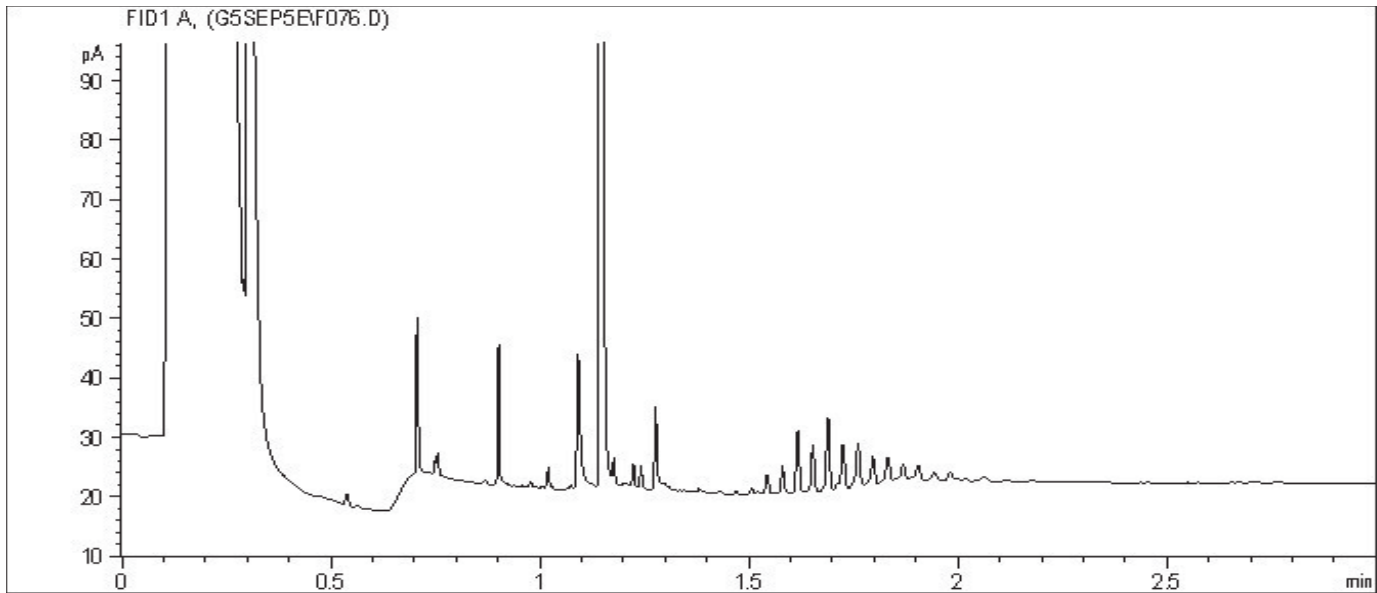
B377398

Sampler's Signature: <i>A. Bodges</i>	Relinquished by: Signature: <i>Adam B.</i>	Company: GOLDEN	Date: AUGUST 29 th /13	Time: 06:00	Received by: Signature: <i>Laurel Berthier</i>	Company:
Sample Storage (°C):	Relinquished by: Signature:	Company:	Date:	Time:	Received by: Signature:	Company:
Comments: PLEASE SEND EQUSS REPORT TO SWOSZIAL @golder.com	Method of Shipment: AIR	Waybill No.: FLIGHT 585	Received for Lab by: <i>Laurel Berthier</i>	Date: 2013/08/29	Time: 13:30	
	Shipped by: AIR NORTH	Shipment Condition: Seal Intact: NA	Temp (°C): 6.87	Cooler opened by:	Date:	Time:

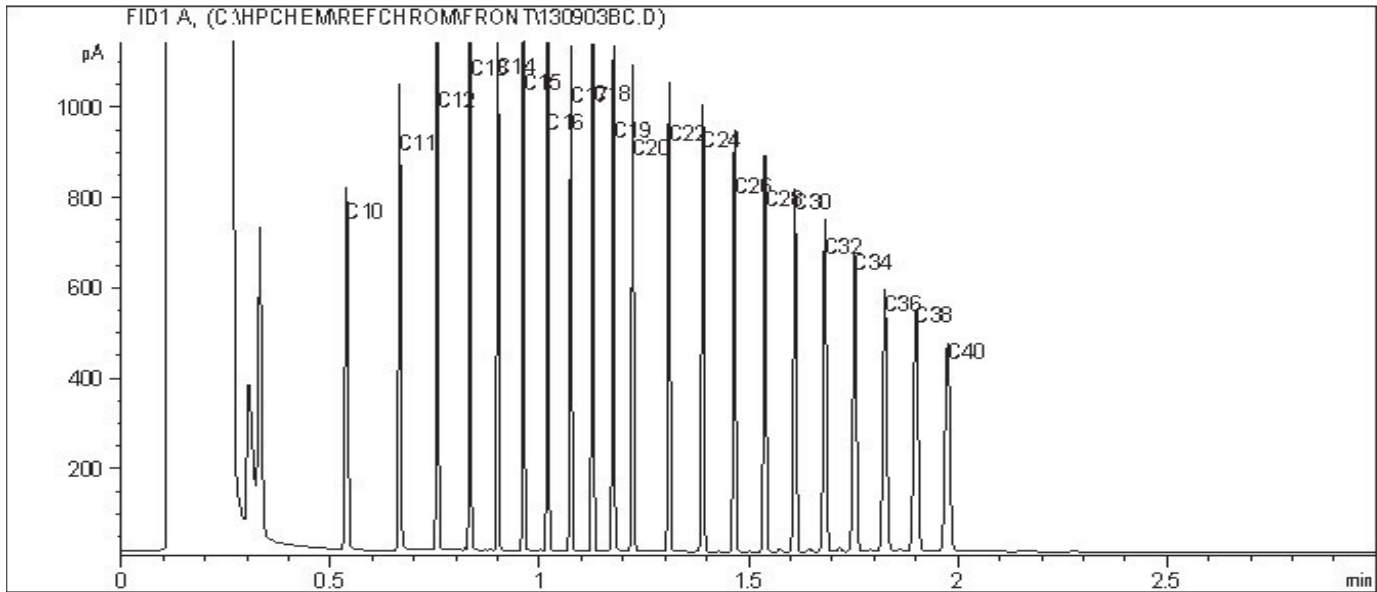
Report Date: 2013/09/06
 Maxxam Job #: B377398
 Maxxam Sample: HI9745

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24336-01

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



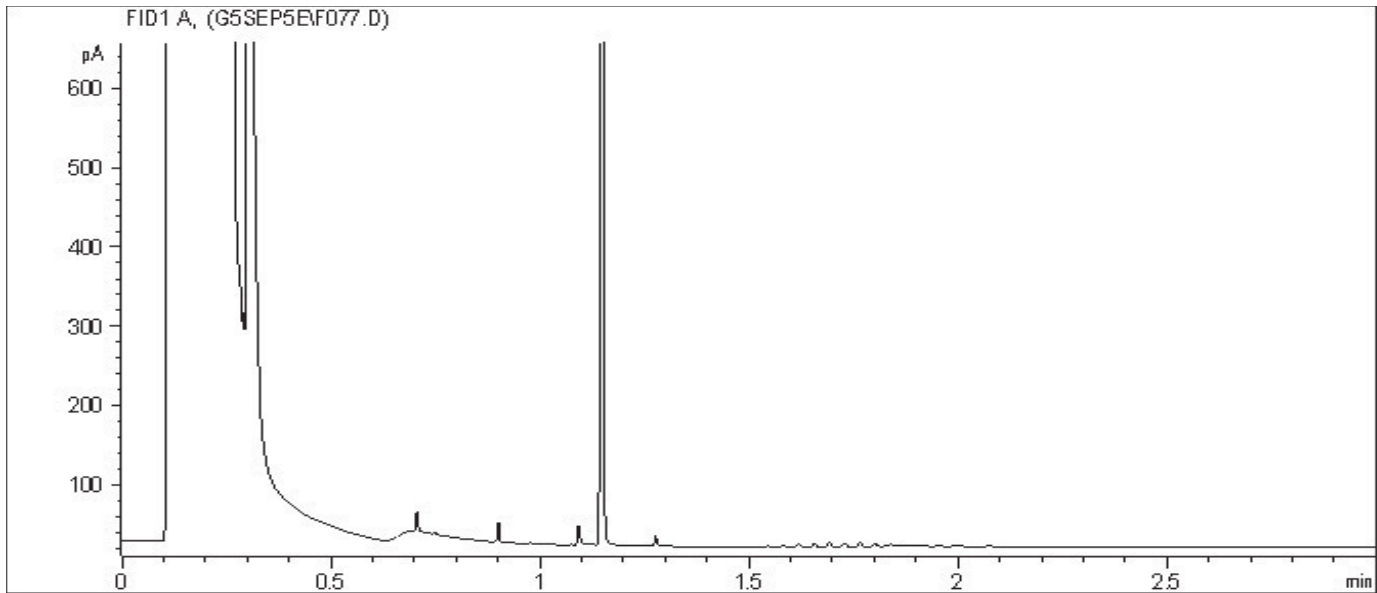
TYPICAL PRODUCT CARBON NUMBER RANGES

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

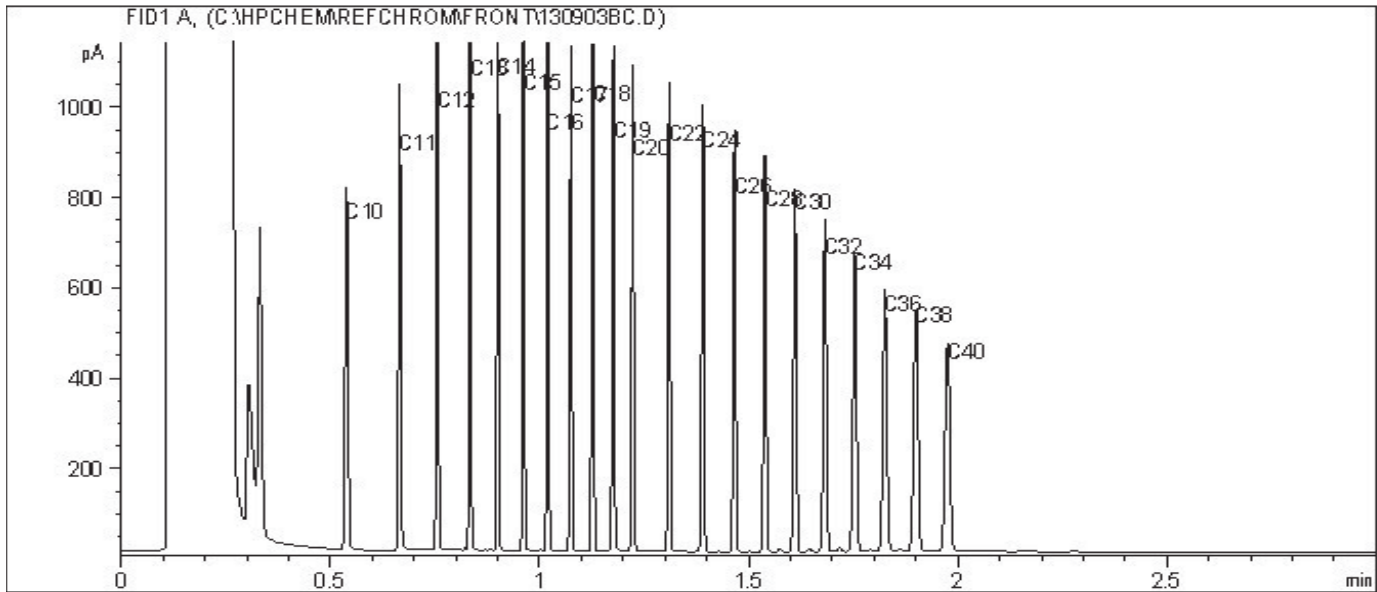
Report Date: 2013/09/06
 Maxxam Job #: B377398
 Maxxam Sample: HI9747

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24336-03

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



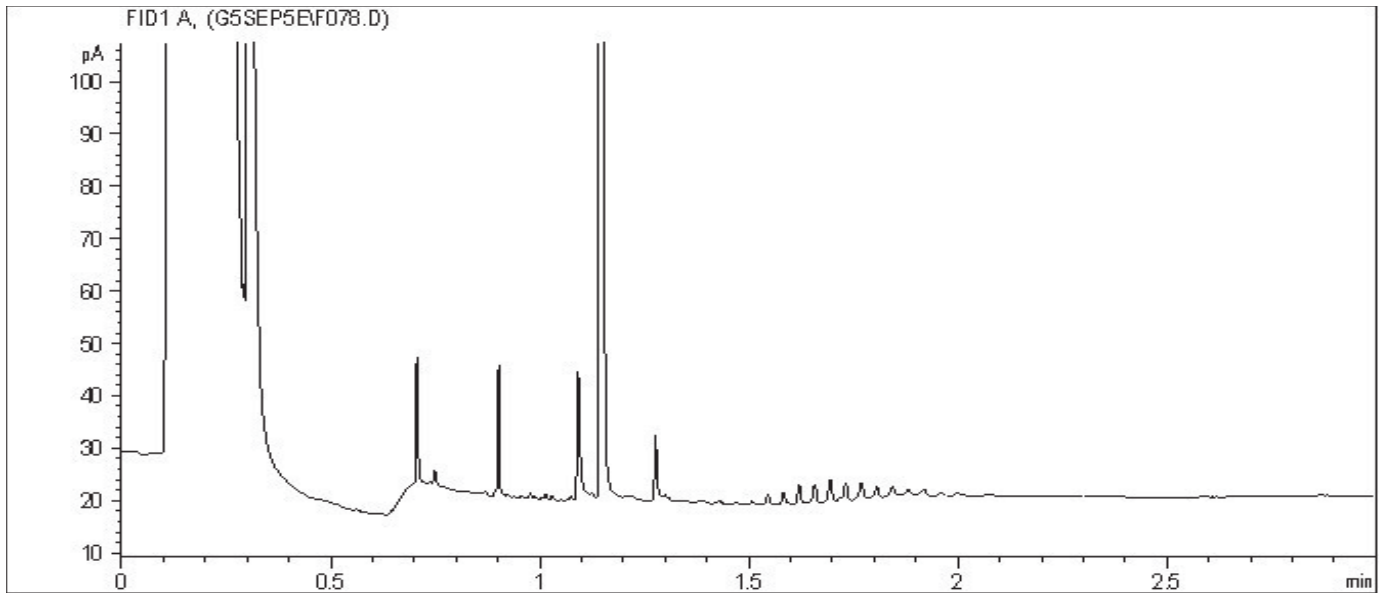
TYPICAL PRODUCT CARBON NUMBER RANGES

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

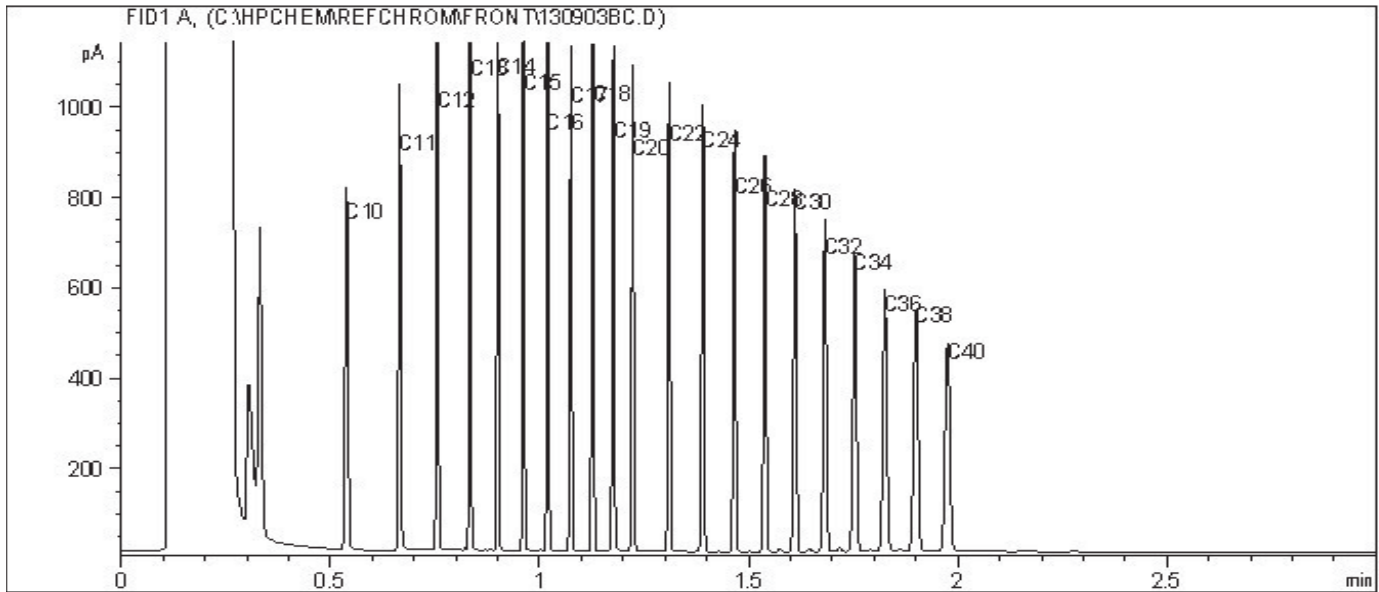
Report Date: 2013/09/06
 Maxxam Job #: B377398
 Maxxam Sample: HI9748

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24336-04

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



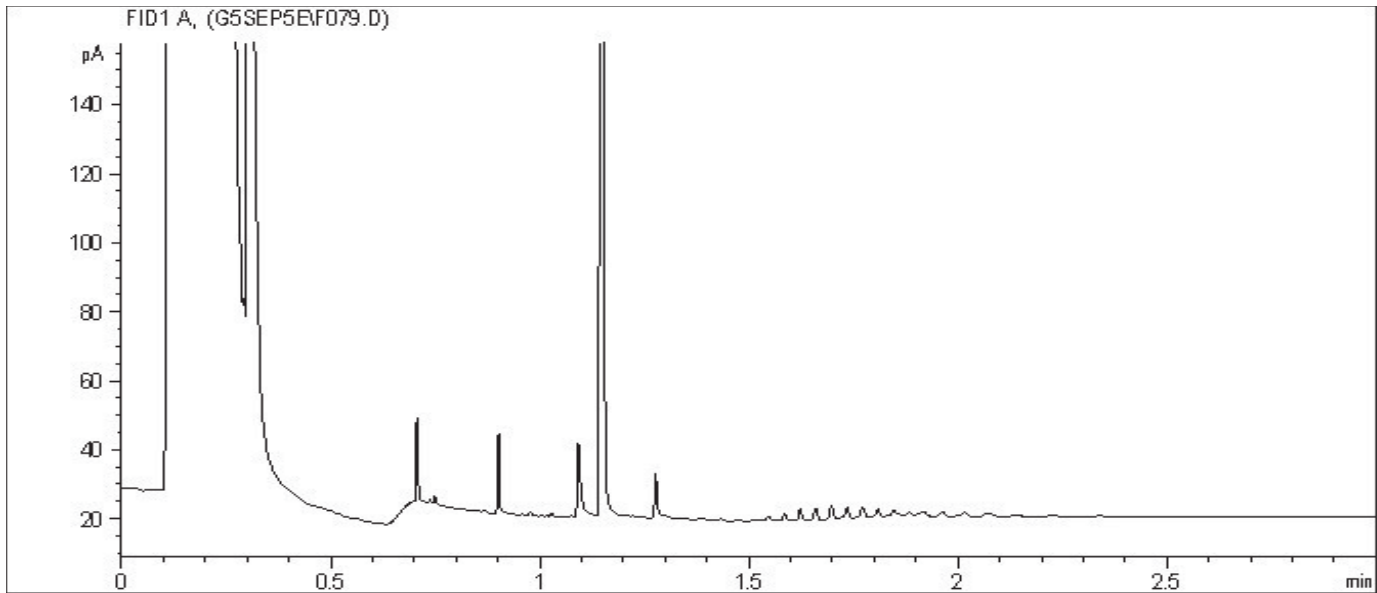
TYPICAL PRODUCT CARBON NUMBER RANGES

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

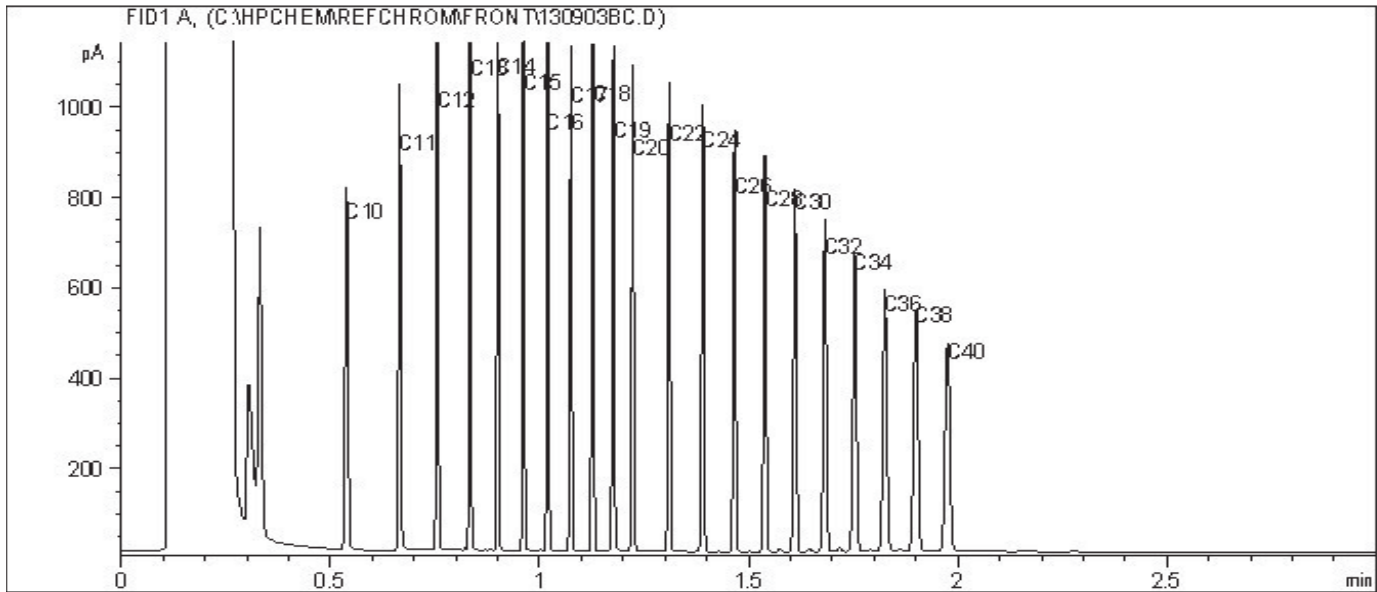
Report Date: 2013/09/06
 Maxxam Job #: B377398
 Maxxam Sample: HI9749

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24336-05

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



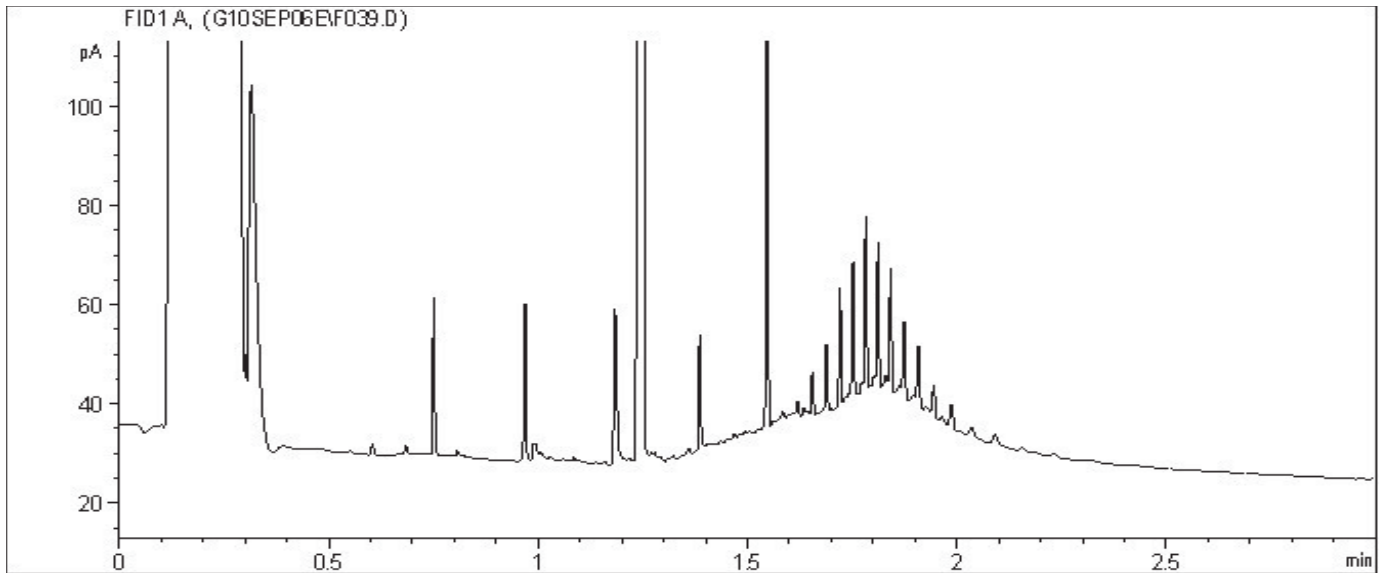
TYPICAL PRODUCT CARBON NUMBER RANGES

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

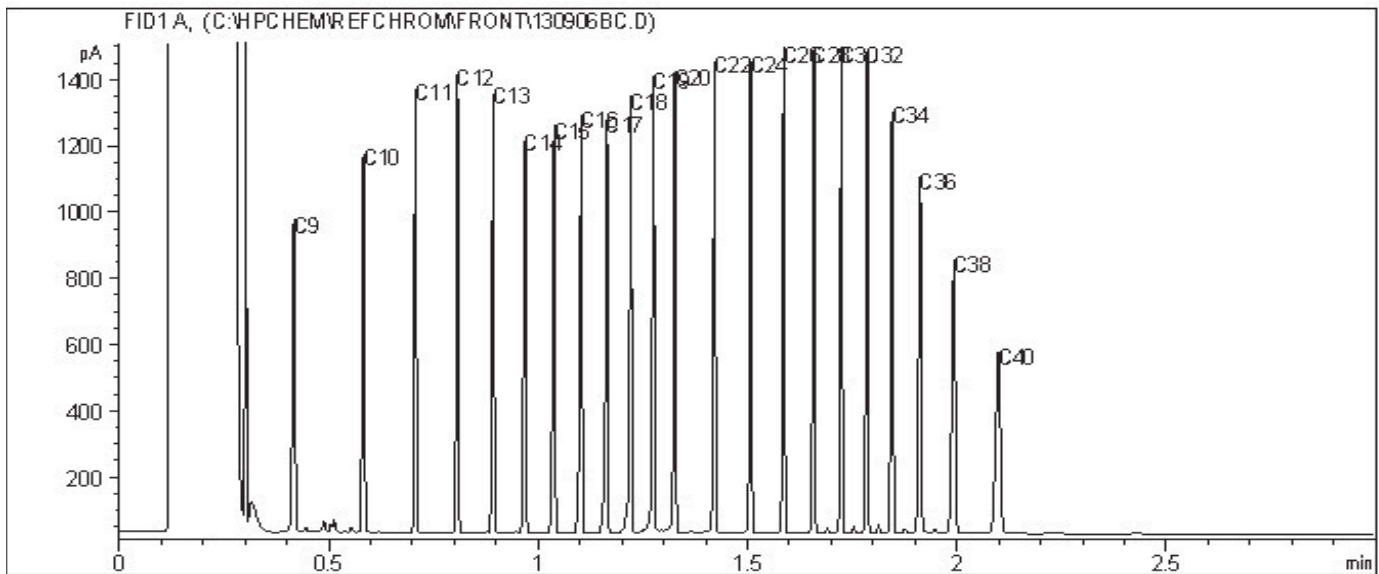
Report Date: 2013/09/06
 Maxxam Job #: B377398
 Maxxam Sample: HI9753

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24336-09

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 12-1021-0006
Site Location: PHASE7000/7300
Your C.O.C. #: 24337

Attention: Andrea Badger
GOLDER ASSOCIATES LTD
4260 STILL CREEK DRIVE
Suite 500
BURNABY, BC
Canada V5C 6C6

Report Date: 2013/09/09

CERTIFICATE OF ANALYSIS

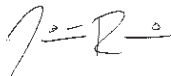
MAXXAM JOB #: B378218
Received: 2013/08/31, 11:45

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
PAH in Water by GC/MS (SIM)	2	2013/09/05	2013/09/06	BBY8SOP-00021	EPA 8270D
Total LMW, HMW, Total PAH Calc	2	N/A	2013/09/06	BBY WI-00033	BC MOE Lab Method

* Results relate only to the items tested.

Encryption Key



Tabitha Rudkin

09 Sep 2013 13:39:17 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Tabitha Rudkin, Burnaby Project Manager
Email: TRudkin@maxxam.ca
Phone# (604) 638-2639

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B378218
 Report Date: 2013/09/09

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE7000/7300
 Sampler Initials: AB

CSR PAH IN WATER BY GC-MS (WATER)

Maxxam ID		HJ5899	HJ5900		
Sampling Date		2013/08/28	2013/08/28		
	UNITS	24337-01	24337-02	RDL	QC Batch
Polycyclic Aromatics					
Low Molecular Weight PAH's	ug/L	0.52	<0.50	0.50	7134016
High Molecular Weight PAH's	ug/L	0.12	<0.050	0.050	7134016
Total PAH	ug/L	0.64	<0.50	0.50	7134016
Naphthalene	ug/L	0.34	<0.10	0.10	7144802
2-Methylnaphthalene	ug/L	<0.10	<0.10	0.10	7144802
Quinoline	ug/L	<0.50	<0.50	0.50	7144802
Acenaphthylene	ug/L	<0.050	<0.050	0.050	7144802
Acenaphthene	ug/L	<0.050	<0.050	0.050	7144802
Fluorene	ug/L	0.052	<0.050	0.050	7144802
Phenanthrene	ug/L	0.13	<0.050	0.050	7144802
Anthracene	ug/L	<0.010	<0.010	0.010	7144802
Acridine	ug/L	<0.050	<0.050	0.050	7144802
Fluoranthene	ug/L	0.060	<0.020	0.020	7144802
Pyrene	ug/L	0.029	<0.020	0.020	7144802
Benzo(a)anthracene	ug/L	0.021	<0.010	0.010	7144802
Chrysene	ug/L	<0.050	<0.050	0.050	7144802
Benzo(b&j)fluoranthene	ug/L	<0.050	<0.050	0.050	7144802
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	0.050	7144802
Benzo(a)pyrene	ug/L	0.0092	<0.0090	0.0090	7144802
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	0.050	7144802
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	0.050	7144802
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	0.050	7144802
Surrogate Recovery (%)					
D10-ANTHRACENE (sur.)	%	81	84		7144802
D8-ACENAPHTHYLENE (sur.)	%	87	83		7144802
D8-NAPHTHALENE (sur.)	%	83	79		7144802
D9-Acridine	%	66	66		7144802
TERPHENYL-D14 (sur.)	%	56 ⁽¹⁾	46 ⁽²⁾		7144802

RDL = Reportable Detection Limit

(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) - Surrogate recovery below control limit - Matrix interference - Pot. low bias

Maxxam Job #: B378218
 Report Date: 2013/09/09

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE7000/7300
 Sampler Initials: AB

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7144802	D10-ANTHRACENE (sur.)	2013/09/05	92	60 - 130	88	60 - 130	86	%		
7144802	D8-ACENAPHTHYLENE (sur.)	2013/09/05	92	50 - 130	90	50 - 130	88	%		
7144802	D8-NAPHTHALENE (sur.)	2013/09/05	88	50 - 130	87	50 - 130	85	%		
7144802	D9-Acridine	2013/09/05	75	50 - 130	73	50 - 130	68	%		
7144802	TERPHENYL-D14 (sur.)	2013/09/05	69	60 - 130	82	60 - 130	79	%		
7144802	Naphthalene	2013/09/06	73	40 - 130	69	50 - 130	<0.10	ug/L	NC	40
7144802	2-Methylnaphthalene	2013/09/06	75	40 - 130	70	50 - 130	<0.10	ug/L	NC	40
7144802	Quinoline	2013/09/06	99	40 - 130	98	50 - 130	<0.50	ug/L	NC	40
7144802	Acenaphthylene	2013/09/06	76	40 - 130	72	50 - 130	<0.050	ug/L	NC	40
7144802	Acenaphthene	2013/09/06	76	40 - 130	72	50 - 130	<0.050	ug/L	NC	40
7144802	Fluorene	2013/09/06	78	40 - 130	74	50 - 130	<0.050	ug/L	NC	40
7144802	Phenanthrene	2013/09/06	70	40 - 130	65	60 - 130	<0.050	ug/L	NC	40
7144802	Anthracene	2013/09/06	73	40 - 130	72	60 - 130	<0.010	ug/L	NC	40
7144802	Acridine	2013/09/06	63	40 - 130	59	50 - 130	<0.050	ug/L	NC	40
7144802	Fluoranthene	2013/09/06	72	40 - 130	68	60 - 130	<0.020	ug/L	NC	40
7144802	Pyrene	2013/09/06	74	40 - 130	69	60 - 130	<0.020	ug/L	NC	40
7144802	Benzo(a)anthracene	2013/09/06	68	40 - 130	69	60 - 130	<0.010	ug/L	NC	40
7144802	Chrysene	2013/09/06	69	40 - 130	70	60 - 130	<0.050	ug/L	NC	40
7144802	Benzo(b&j)fluoranthene	2013/09/06	73	40 - 130	73	60 - 130	<0.050	ug/L	NC	40
7144802	Benzo(k)fluoranthene	2013/09/06	65	40 - 130	68	60 - 130	<0.050	ug/L	NC	40
7144802	Benzo(a)pyrene	2013/09/06	71	40 - 130	73	60 - 130	<0.0090	ug/L	NC	40
7144802	Indeno(1,2,3-cd)pyrene	2013/09/06	75	40 - 130	73	60 - 130	<0.050	ug/L	NC	40
7144802	Dibenz(a,h)anthracene	2013/09/06	73	40 - 130	69	60 - 130	<0.050	ug/L	NC	40
7144802	Benzo(g,h,i)perylene	2013/09/06	71	40 - 130	70	60 - 130	<0.050	ug/L	NC	40

N/A = Not Applicable

RPD = Relative Percent Difference

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.


Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B378218

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Rob Reinert, Data Validation Coordinator

=====
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500-4260 Still Creek Drive
 Burnaby, British Columbia, Canada V5C 6C6
 Telephone: 604-298-6623 Fax: 604-298-5253

B378218

CHAIN-OF-CUSTODY RECORD/ANALYSIS REQUEST

NO 24337 Page 1 of 1

Project Number: 1210210006 / 7000 / 7300		Laboratory Name: MAXXAM	
Golder Contact: ANOETA Badger		Address: CANADA WAY, BURNABY	
Golder E-mail Address: abadger@golder.com		Tel/Fax:	Contact: TABELIA RUDON

Office the final reports should be sent to:

- 500-4260 Still Creek Drive
Burnaby, BC V5C 6C6
Tel: 604-298-6623
Fax: 604-298-5253
- 202-2790 Gladwin Road
Abbotsford, BC V2T 4S8
Tel: 604-850-8786
Fax: 604-850-8756
- 2640 Douglas Street
Victoria, BC V8T 4M1
Tel: 250-881-7372
Fax: 250-881-7470

Analyses Required

Sample Control Number (SCN)	Sample Matrix (over)	Date Sampled (D/M/Y)	Number of Containers*	Remarks (over)
24337 -01	FW	28/08/13	2 X	
24337 -02	GW	28/08/13	2 X	
-03				
-04				
-05				
-06				
-07				
-08				
-09				
-10				
-11				
-12				



18378218

Sampler's Signature: <i>Badger</i>	Relinquished by: Signature: <i>Badger</i>	Company: GOLDER	Date: 30-AUG-13	Time: 16:30	Received by: Signature: <i>ERIC YAN</i>	Company:
Sample Storage (°C):	Relinquished by: Signature:	Company:	Date:	Time:	Received by: Signature:	Company:
Comments:	Method of Shipment:	Waybill No.:	Received for Lab by: <i>ERIC YAN</i>		Date: 2013/08/30	Time: 11:45
	Shipped by:	Shipment Condition:	Temp (°C): 14.15, 12	Cooler opened by:	Date:	Time:

Your Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Your C.O.C. #: 24340

Attention: Andrea Badger
 GOLDER ASSOCIATES LTD
 4260 STILL CREEK DRIVE
 Suite 500
 BURNABY, BC
 Canada V5C 6C6

Report Date: 2013/10/09

CERTIFICATE OF ANALYSIS

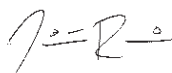
MAXXAM JOB #: B390315
Received: 2013/10/02, 14:10

Sample Matrix: Water
 # Samples Received: 4

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/MTBE LH, VH, F1 SIM/MS	4	2013/10/03	2013/10/05	BBY8-SOP-00010	EPA 8260C
Extrac. Pet HC when LEPH/HEPH required	4	2013/10/08	2013/10/08	BBY8SOP-00029	BC Env. Lab Manual
PAH in Water by GC/MS (SIM)	4	2013/10/08	2013/10/09	BBY8SOP-00021	EPA 8270D
Total LMW, HMW, Total PAH Calc	4	N/A	2013/10/09	BBY WI-00033	BC MOE Lab Method
EPH less PAH in Water by GC/FID	4	N/A	2013/10/09	BBY WI-00033	BC MOE Lab Method
Volatile HC-BTEX	4	N/A	2013/10/07	BBY WI-00033	BC MOE Lab Method

* Results relate only to the items tested.

Encryption Key



Tabitha Rudkin

09 Oct 2013 17:31:28 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Tabitha Rudkin, Burnaby Project Manager
 Email: TRudkin@maxxam.ca
 Phone# (604) 638-2639

=====
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Total cover pages: 1



Maxxam Job #: B390315
 Report Date: 2013/10/09

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: DS

BCCSR BTEX/VPH IN WATER (WATER)

Maxxam ID		HR8553	HR8554	HR8555	HR8556		
Sampling Date		2013/09/27	2013/09/27	2013/09/27	2013/09/28		
	UNITS	24340-01	24340-02	24340-03	24340-04	RDL	QC Batch
Volatiles							
VPH (VHW6 to 10 - BTEX)	ug/L	<300	<300	<300	<300	300	7203084
Methyl-tert-butylether (MTBE)	ug/L	<4.0	<4.0	<4.0	<4.0	4.0	7206699
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7206699
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7206699
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7206699
m & p-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7206699
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7206699
Styrene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7206699
Xylenes (Total)	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7206699
VH C6-C10	ug/L	<300	<300	<300	<300	300	7206699
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	90	103	89	90		7206699
4-BROMOFLUOROBENZENE (sur.)	%	99	99	101	99		7206699
D4-1,2-DICHLOROETHANE (sur.)	%	103	96	101	103		7206699

RDL = Reportable Detection Limit

Maxxam Job #: B390315
 Report Date: 2013/10/09

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: DS

LEPH & HEPH FOR CSR IN WATER (WATER)

Maxxam ID		HR8553	HR8554	HR8555	HR8556		
Sampling Date		2013/09/27	2013/09/27	2013/09/27	2013/09/28		
	UNITS	24340-01	24340-02	24340-03	24340-04	RDL	QC Batch
Polycyclic Aromatics							
Low Molecular Weight PAH's	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7202707
High Molecular Weight PAH's	ug/L	<0.050	0.077	0.078	<0.050	0.050	7202707
Total PAH	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7202707
Naphthalene	ug/L	<0.10	0.20	0.21	<0.10	0.10	7214114
2-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	7214114
Quinoline	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7214114
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Phenanthrene	ug/L	<0.050	0.082	0.084	<0.050	0.050	7214114
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	7214114
Acridine	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Fluoranthene	ug/L	<0.020	0.042	0.041	<0.020	0.020	7214114
Pyrene	ug/L	<0.020	0.022	0.023	<0.020	0.020	7214114
Benzo(a)anthracene	ug/L	<0.010	0.014	0.015	<0.010	0.010	7214114
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Benzo(b&j)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Benzo(a)pyrene	ug/L	<0.0090	<0.0090	<0.0090	<0.0090	0.0090	7214114
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7214114
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	122	108	109	107		7214114
D8-ACENAPHTHYLENE (sur.)	%	119	109	111	105		7214114
D8-NAPHTHALENE (sur.)	%	130	104	107	101		7214114
D9-Acridine	%	97	75	75	80		7214114
TERPHENYL-D14 (sur.)	%	110	96	96	98		7214114
Calculated Parameters							
LEPH (C10-C19 less PAH)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	7203083
HEPH (C19-C32 less PAH)	mg/L	<0.20	<0.20	<0.20	0.21	0.20	7203083
Ext. Pet. Hydrocarbon							
EPH (C10-C19)	mg/L	<0.20	<0.20	<0.20	<0.20	0.20	7214129
EPH (C19-C32)	mg/L	<0.20	<0.20	<0.20	0.21	0.20	7214129
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	99	100	100	99		7214129

RDL = Reportable Detection Limit

Maxxam Job #: B390315
 Report Date: 2013/10/09

 GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: DS

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7206699	1,4-Difluorobenzene (sur.)	2013/10/04	88	70 - 130	89	70 - 130	102	%		
7206699	4-BROMOFLUOROBENZENE (sur.)	2013/10/04	101	70 - 130	101	70 - 130	101	%		
7206699	D4-1,2-DICHLOROETHANE (sur.)	2013/10/04	94	70 - 130	100	70 - 130	103	%		
7206699	Methyl-tert-butylether(MTBE)	2013/10/05	98	70 - 130	98	70 - 130	<4.0	ug/L	NC	30
7206699	Benzene	2013/10/05	92	70 - 130	94	70 - 130	<0.40	ug/L	NC	30
7206699	Toluene	2013/10/05	91	70 - 130	91	70 - 130	<0.40	ug/L	NC	30
7206699	Ethylbenzene	2013/10/05	96	70 - 130	96	70 - 130	<0.40	ug/L	0	30
7206699	m & p-Xylene	2013/10/05	92	70 - 130	92	70 - 130	<0.40	ug/L	3.0	30
7206699	o-Xylene	2013/10/05	94	70 - 130	93	70 - 130	<0.40	ug/L	NC	30
7206699	Styrene	2013/10/05	101	70 - 130	99	70 - 130	<0.40	ug/L	6.9	30
7206699	VH C6-C10	2013/10/05			79	70 - 130	<300	ug/L	NC	30
7206699	Xylenes (Total)	2013/10/05					<0.40	ug/L	2.1	30
7214114	D10-ANTHRACENE (sur.)	2013/10/09	112	60 - 130	114	60 - 130	118	%		
7214114	D8-ACENAPHTHYLENE (sur.)	2013/10/09	108	50 - 130	113	50 - 130	111	%		
7214114	D8-NAPHTHALENE (sur.)	2013/10/09	122	50 - 130	121	50 - 130	106	%		
7214114	D9-Acridine	2013/10/09	85	50 - 130	90	50 - 130	87	%		
7214114	TERPHENYL-D14 (sur.)	2013/10/09	104	60 - 130	108	60 - 130	111	%		
7214114	Naphthalene	2013/10/09	110	40 - 130	108	50 - 130	<0.10	ug/L	NC	40
7214114	2-Methylnaphthalene	2013/10/09	101	40 - 130	105	50 - 130	<0.10	ug/L	NC	40
7214114	Quinoline	2013/10/09	110	40 - 130	107	50 - 130	<0.50	ug/L	NC	40
7214114	Acenaphthylene	2013/10/09	98	40 - 130	101	50 - 130	<0.050	ug/L	NC	40
7214114	Acenaphthene	2013/10/09	102	40 - 130	105	50 - 130	<0.050	ug/L	NC	40
7214114	Fluorene	2013/10/09	97	40 - 130	100	50 - 130	<0.050	ug/L	NC	40
7214114	Phenanthrene	2013/10/09	97	40 - 130	105	60 - 130	<0.050	ug/L	NC	40
7214114	Anthracene	2013/10/09	97	40 - 130	103	60 - 130	<0.010	ug/L	NC	40
7214114	Acridine	2013/10/09	84	40 - 130	86	50 - 130	<0.050	ug/L	NC	40
7214114	Fluoranthene	2013/10/09	91	40 - 130	100	60 - 130	<0.020	ug/L	NC	40
7214114	Pyrene	2013/10/09	94	40 - 130	99	60 - 130	<0.020	ug/L	NC	40
7214114	Benzo(a)anthracene	2013/10/09	72	40 - 130	100	60 - 130	<0.010	ug/L	NC	40
7214114	Chrysene	2013/10/09	70	40 - 130	102	60 - 130	<0.050	ug/L	NC	40
7214114	Benzo(b&i)fluoranthene	2013/10/09	72	40 - 130	102	60 - 130	<0.050	ug/L	NC	40
7214114	Benzo(k)fluoranthene	2013/10/09	67	40 - 130	107	60 - 130	<0.050	ug/L	NC	40
7214114	Benzo(a)pyrene	2013/10/09	75	40 - 130	111	60 - 130	<0.0090	ug/L	NC	40
7214114	Indeno(1,2,3-cd)pyrene	2013/10/09	74	40 - 130	109	60 - 130	<0.050	ug/L	NC	40
7214114	Dibenz(a,h)anthracene	2013/10/09	70	40 - 130	104	60 - 130	<0.050	ug/L	NC	40
7214114	Benzo(g,h,i)perylene	2013/10/09	72	40 - 130	103	60 - 130	<0.050	ug/L	NC	40
7214129	O-TERPHENYL (sur.)	2013/10/08	102	50 - 130	100	50 - 130	100	%		

Maxxam Job #: B390315
 Report Date: 2013/10/09

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Location: PHASE 7000/7300
 Sampler Initials: DS

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7214129	EPH (C10-C19)	2013/10/08	98	50 - 130	100	50 - 130	<0.20	mg/L	NC	30
7214129	EPH (C19-C32)	2013/10/08	88	50 - 130	87	50 - 130	<0.20	mg/L	NC	30

N/A = Not Applicable

RPD = Relative Percent Difference

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B390315

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

A handwritten signature in blue ink, appearing to read "Andy Lu".

Andy Lu, Data Validation Coordinator

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



500-4260 Still Creek Drive
Burnaby, British Columbia, Canada V5C 6C6
Telephone: 604-298-8623 Fax: 604-298-5253

B390315

CHAIN-OF-CUSTODY RECORD/ANALYSIS REQUEST

NO 24340

page 1 of 1

Project Number: 12-1021-0006/7000/7300		Laboratory Name: Maxxam Analytics	
		Address: 4606 Canada Way, Burnaby, BC	
Golder Contact: Andrea Badger	Golder E-mail Address: abadger@golder.com	Tel/Fax: 604-734-7276	Contact: Tabitha Rudkin

Office the final reports should be sent to: **cc.tjrenolds@golder.com**

<input checked="" type="checkbox"/> 500-4260 Still Creek Drive Burnaby, BC V5C 6C6 Tel: 604-298-8623 Fax: 604-298-5253	<input type="checkbox"/> 202-2790 Gladwin Road Abbotsford, BC V2T 4S8 Tel: 604-850-8786 Fax: 604-850-8756	<input type="checkbox"/> 2640 Douglas Street Victoria, BC V8T 4M1 Tel: 250-881-7372 Fax: 250-881-7470
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		Analyses Required							
Sample Control Number (SCN)	Sample Matrix (over)	Date Sampled (D/M/Y)	Number of Containers	LEPH/HEPH/PAH		BTEX		RUSH	Remarks (over)
				X	X	X	X		
24340 -01	gw	27/9/13	5	X	X				HR8553
24340 -02	↓	↓	5	X	X				HR8554
24340 -03	↓	↓	5	X	X				HR8555
24340 -04	↓	28/9/13	5	X	X				
-05									
-06									
-07									
-08									
-09									
-10									
-11									
-12									



B390315

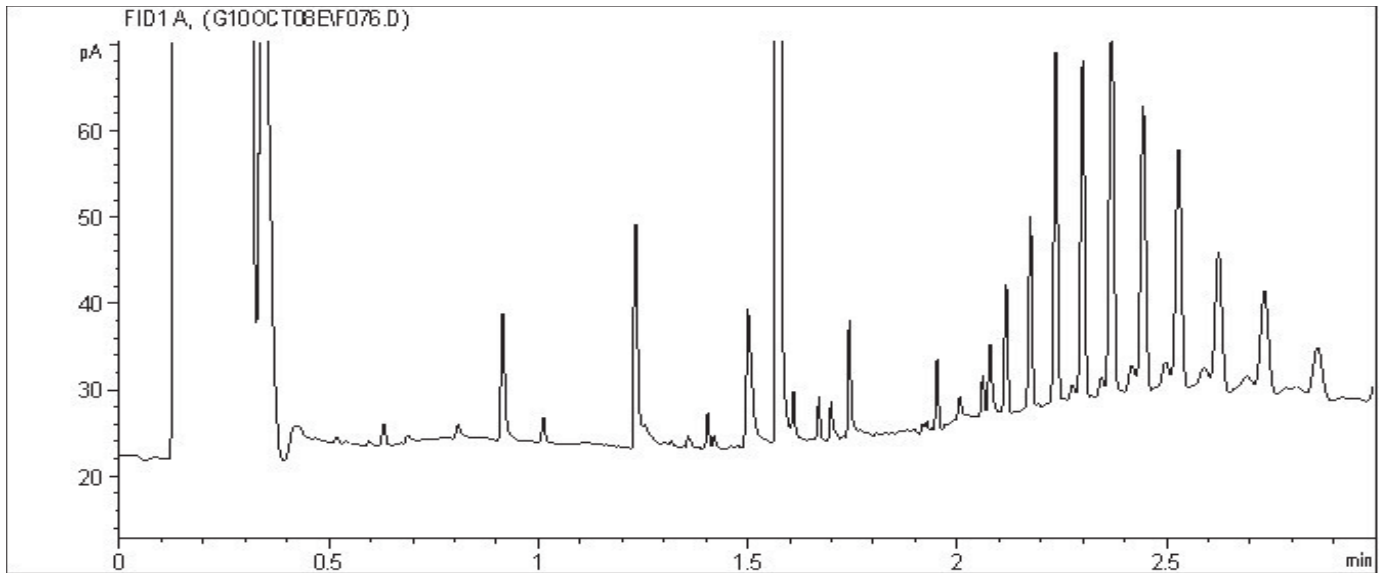
Sampler's Signature: <i>[Signature]</i>	Relinquished by Signature: <i>[Signature]</i>	Company: Golder	Date: Oct 1/13	Time: 18:00	Received by: Signature:	Company:
Sample Storage (°C): ON ICE PACKS/ICE	Relinquished by: Signature:	Company:	Date:	Time:	Received by: Signature:	Company:
Comments:	Method of Shipment: AIR NORTH	Waybill No.:	Received for Lab by: Helen Zhen	Date: 2013/10/02	Time: 14:10	
	Shipped by:	Shipm Page 7 of 12:	Temp (°C): 2.2	Cooler opened by:	Date:	Time:
		Seal Intact:				

WHITE: Golder copy YELLOW: Lab PINK: Lab returns with Final Report CS-NA

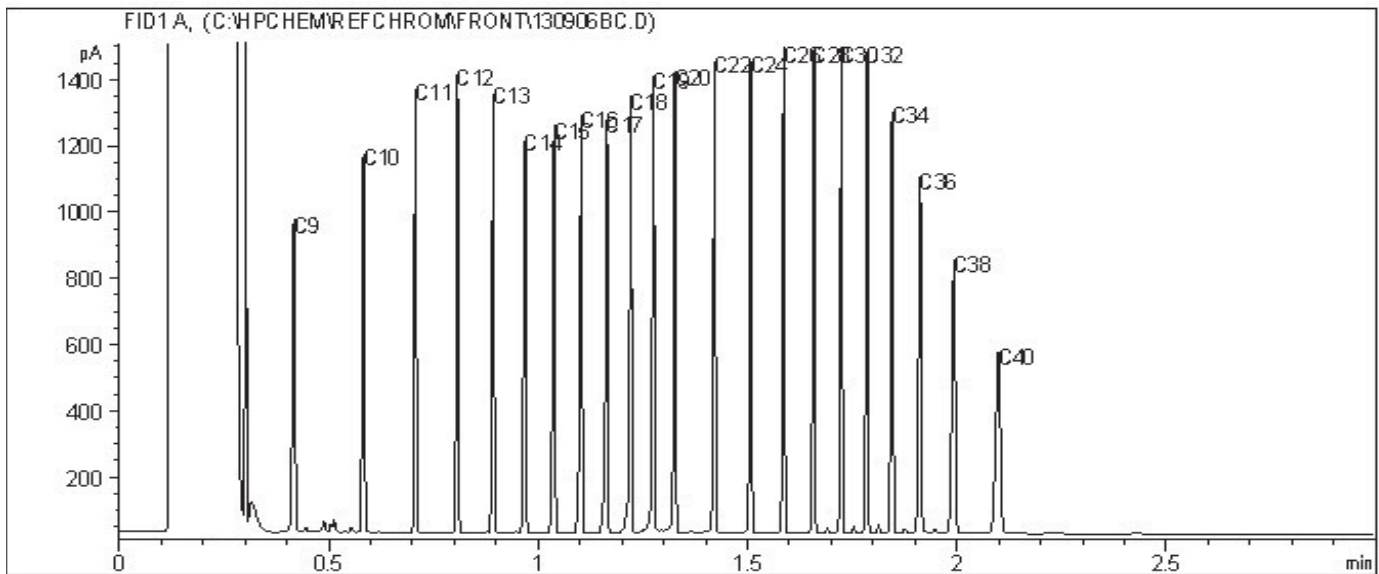
Report Date: 2013/10/09
 Maxxam Job #: B390315
 Maxxam Sample: HR8553

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24340-01

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

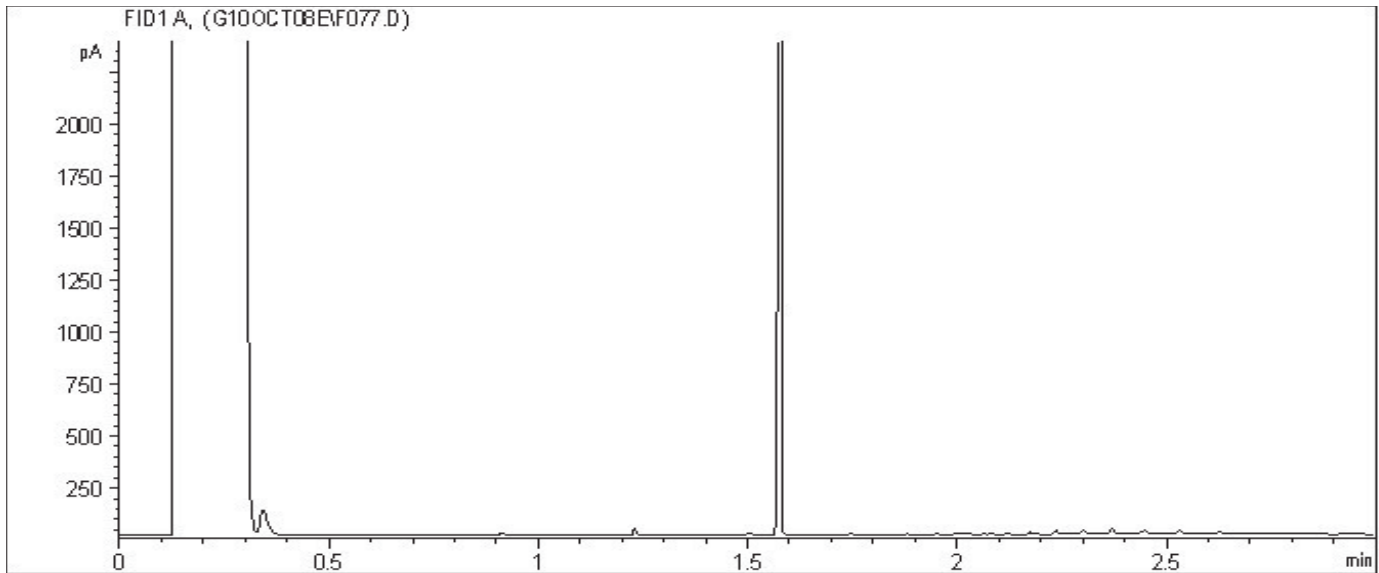
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

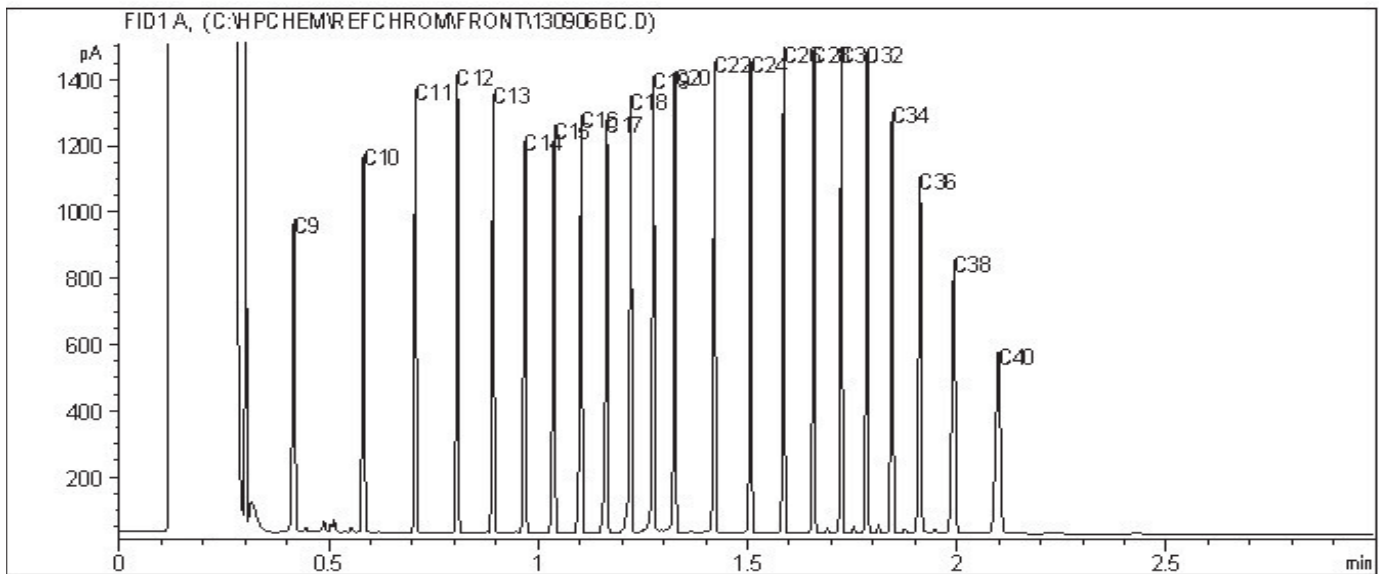
Report Date: 2013/10/09
 Maxxam Job #: B390315
 Maxxam Sample: HR8553 Lab-Dup

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24340-01

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

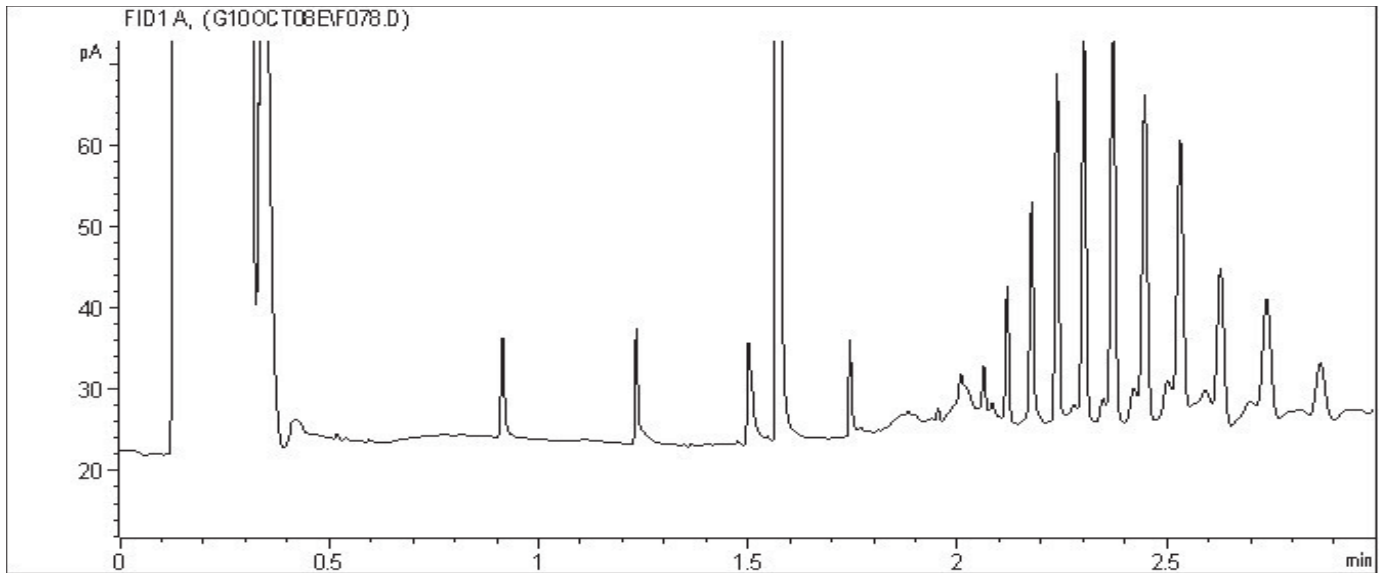
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

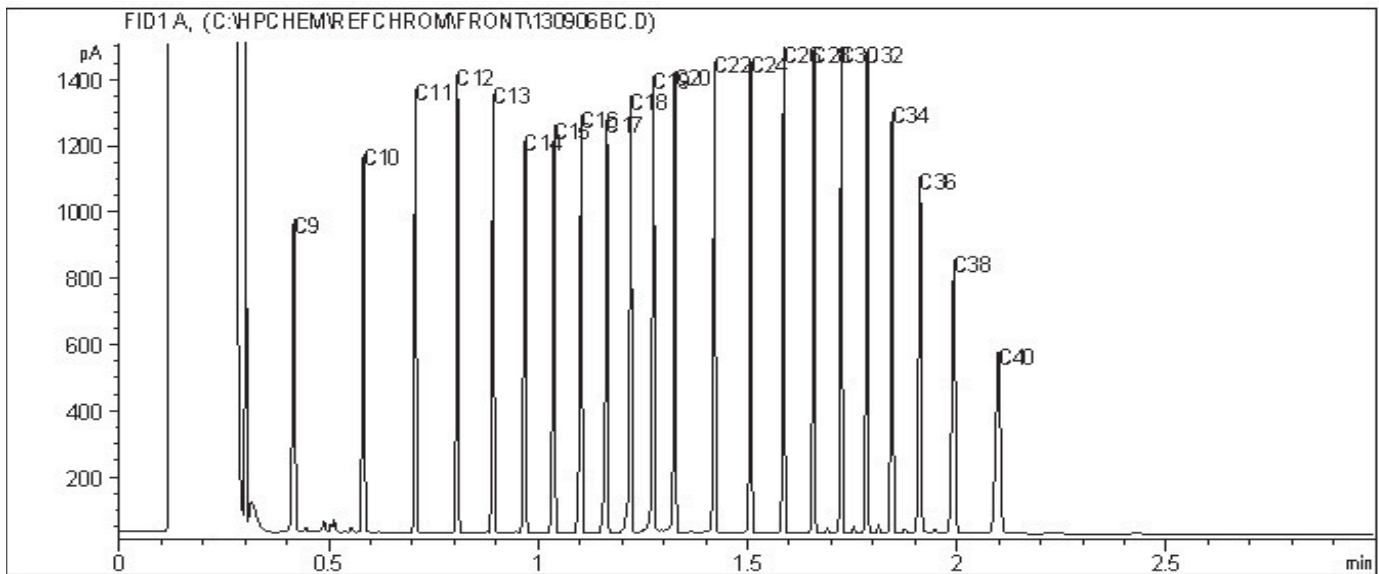
Report Date: 2013/10/09
 Maxxam Job #: B390315
 Maxxam Sample: HR8554

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24340-02

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

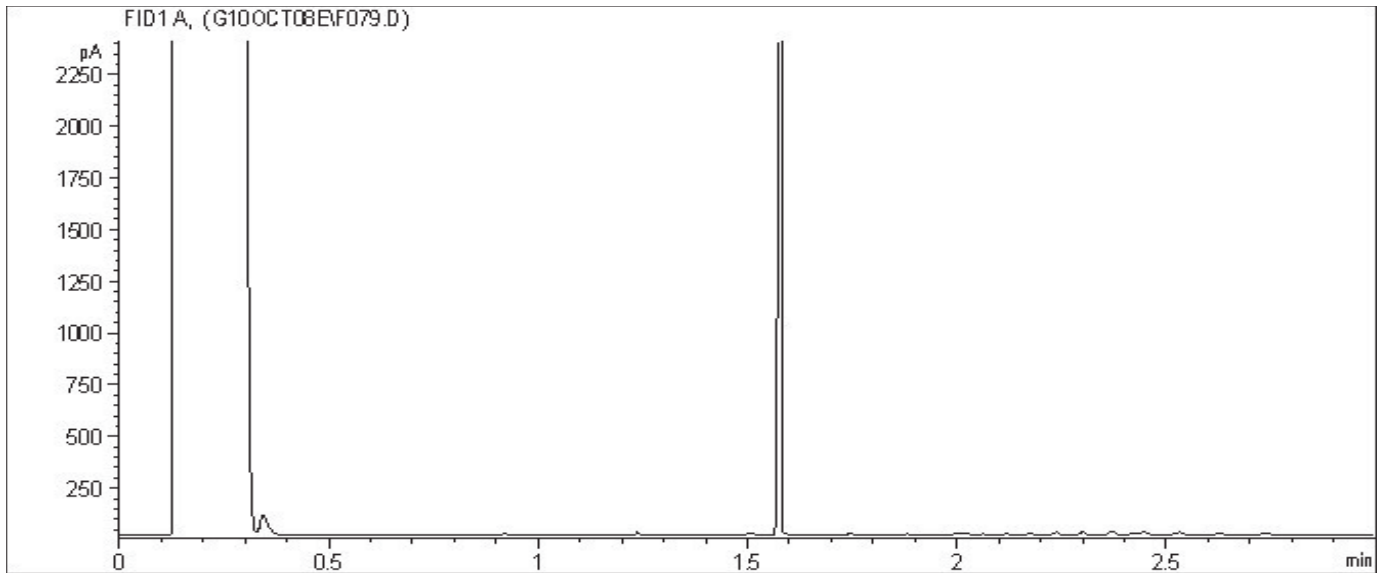
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Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

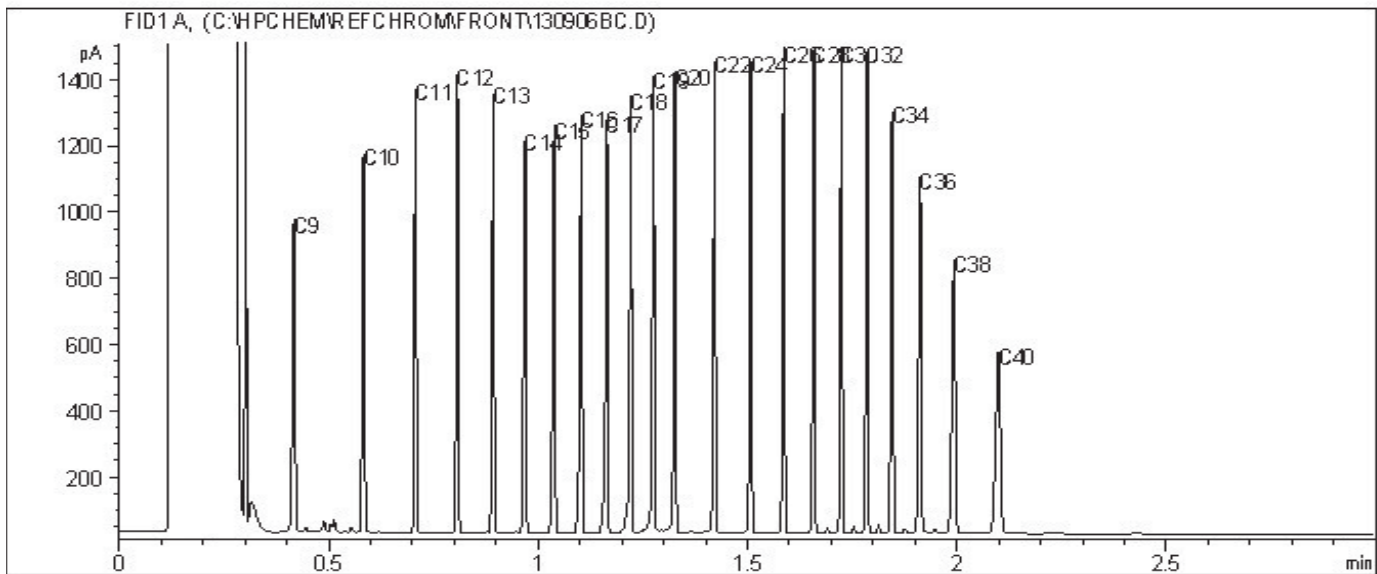
Report Date: 2013/10/09
 Maxxam Job #: B390315
 Maxxam Sample: HR8555

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24340-03

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

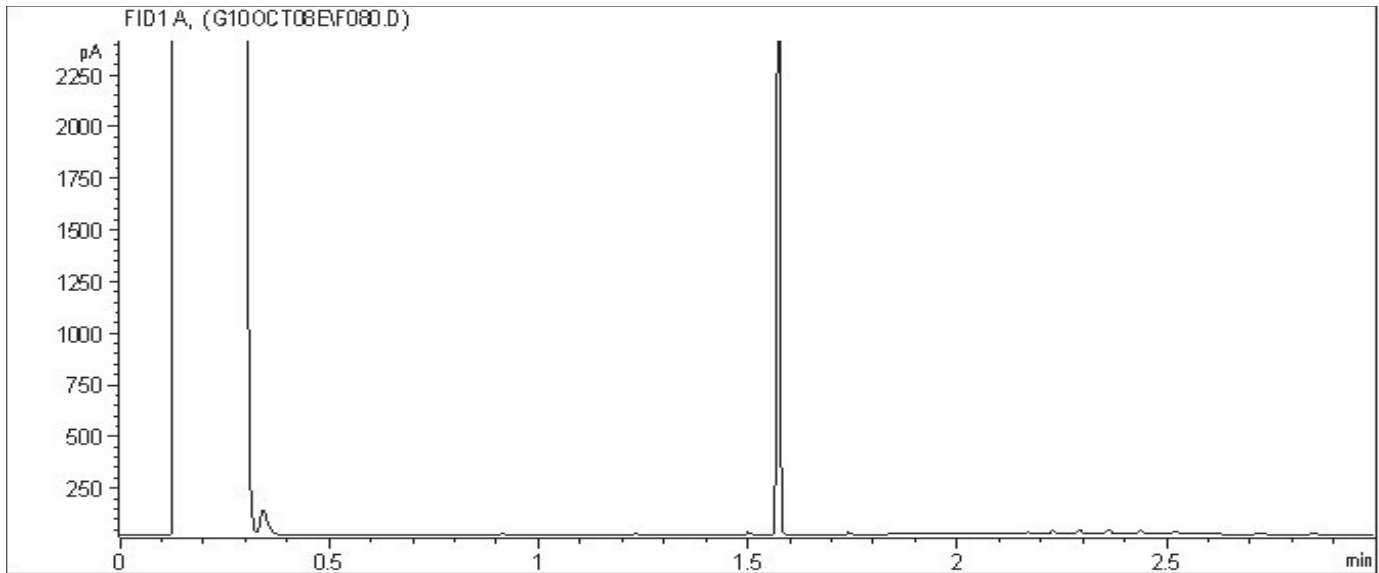
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

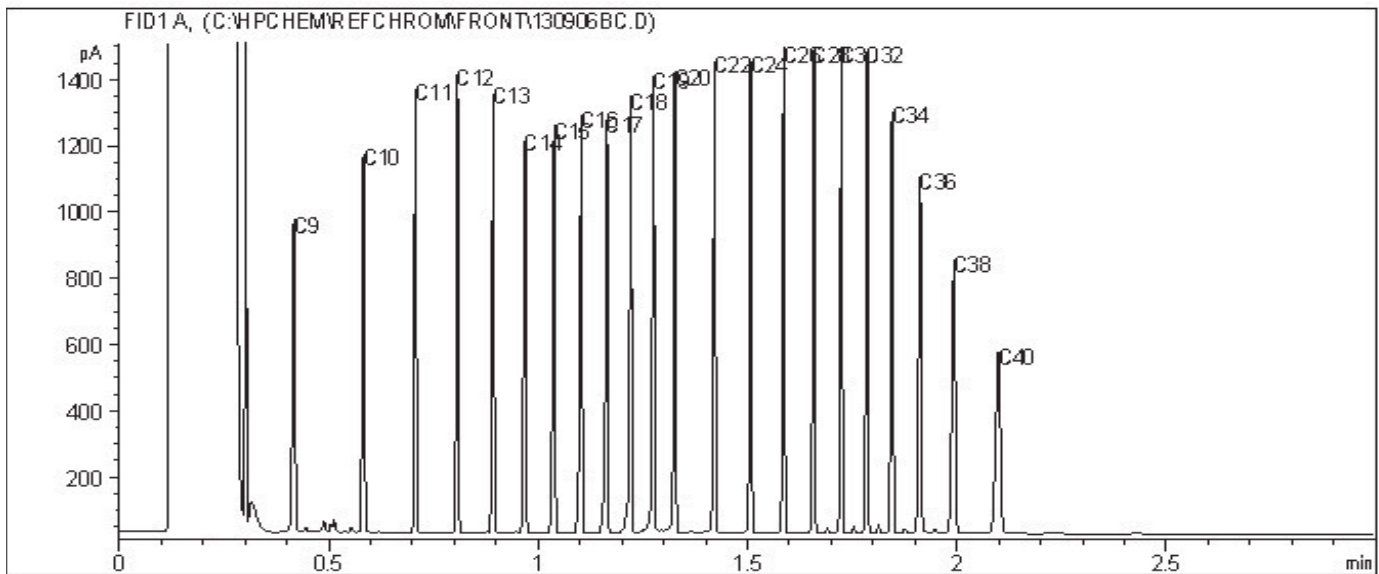
Report Date: 2013/10/09
 Maxxam Job #: B390315
 Maxxam Sample: HR8556

GOLDER ASSOCIATES LTD
 Client Project #: 12-1021-0006
 Site Reference: PHASE 7000/7300
 Client ID: 24340-04

Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.