

APPENDIX 4
BOREHOLE LOGS

SANDWELL EPC INC	DATE OF BOREHOLE: 19 - 10 - 05	BOREHOLE NO: BH-1
PHASE 1 - CACOUNA ENERGY	DATE OF WATER LEVEL: 22 - 10 - 05	PROJECT NO: S-05-1743 (PHASE 1)
GROS CACOUNA, QUEBEC		ELEVATION: 4.00 m
SAMPLE TYPE	<input checked="" type="checkbox"/> SPLIT SPOON <input checked="" type="checkbox"/> NQ CORE	
BACKFILL TYPE	<input checked="" type="checkbox"/> SAND	

DEPTH(m)	ELEVATION DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	SLOTTED STANDPIPE	RECOVERY %		PENETRATION IND. N	DEPTH(m)
									20	40		
0	0.23		QUARRY FINES Fractured SANDSTONE bedrock	X	1	66/ 9"						0
1	2.73		Solid grey SANDSTONE bedrock 200 to 300 mm long pieces becoming laminated with fine interbeds towards bottom. Weathered fractures dipping at 30° and 60° and thin 1 to 3 mm cemented veining. Solid except for the first metre of blast zone.		2		Recovery: 91% RQD: 65%					1
2	1.27			3		Recovery: 97% RQD: 80%						2
3				4		Recovery: 97% RQD: 82%						3
4				5		Recovery: 100% RQD: 87%						4
5	-1.82		Solid MICROCONGLOMERATE 2 mm - 10 mm quartz and feldspar grains and one (1) 70° tight fracture at 6.7m depth.		6		Recovery: 100% RQD: 88%					5
6	5.82			7		Recovery: 100% RQD: 100%						6
7	-3.64		Solid grey SANDSTONE Becoming laminated with fine interbeds with quartz and feldspar grains between 0 - 5 mm becoming more frequent and coarser grained (20 mm) with depth. Steeply dipping 50° to 60° tight fracture planes. 700 to 1300mm long pieces.		8		Recovery: 100% RQD: 100%					7
8	7.64			9		Recovery: 93% RQD: 92%						8
9				10		Recovery: 100% RQD: 100%						9
10	-6.39		Solid MICROCONGLOMERATE quartz and feldspar grains (2mm - 20 mm) 50° fracture at 11m.		11		Recovery: 100% RQD: 100%					10
11	10.39			12		Recovery: 100% RQD: 100%						11
12	-7.30		SANDSTONE grey, quartz and feldspar grains between 0 - 5 mm. One (1) weathered 50° fracture at 13 metres.		13		Recovery: 100% RQD: 100%					12
13	11.30			14		Recovery: 63% RQD: 17%						13
14	-9.23		Silty SANDSTONE dark grey with 60° and 80° weathered thin (1mm) fracture planes throughout.		15							14
15	13.23			16								15
16	-10.96		End of borehole									16
17	14.96											17
18												18

BOREHOLE-TEST 1743-1.GPJ JBAI.GDT 22 - 03 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 20 - 10 - 05	BOREHOLE NO: BH-2
PHASE 1 - CACOUNA ENERGY	DATE OF WATER LEVEL: 22 - 10 - 05	PROJECT NO: S-05-1743 (PHASE 1)
GROS CACOUNA, QUEBEC		ELEVATION: 3.50 m

SAMPLE TYPE NQ CORE
 BACKFILL TYPE SAND

DEPTH(m)	ELEVATION DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	SLOTTED STANDPIPE	RECOVERY %				DEPTH(m)
									20	40	60	80	
0	0.05		ORGANIC MATTER QUARRY FINES									0	
1	2.53		Fractured grey SANDSTONE bedrock Water lost at 1.7metres. Broken core. 20°, 50°, and 80° weathered fractures from 1 to 2.5 metres.		1		Recovery: 60% RQD: 12%					1	
2	0.97				2		Recovery: 75% RQD: 0					2	
3	0.73		Solid grey SANDSTONE bedrock 15° and 20° fractures from 2.5 to 8.5 metres. Minor number of 60° to 70° fractures. 5° and 70° fractures between 8.5 to 9 metres. Thin (10mm) seam of grey silt and sand at 9 metres.		3		Recovery: 97% RQD: 75%					3	
4	2.77				4		Recovery: 100% RQD: 80%					4	
5			Four (4) 500mm long pieces. Remaining pieces 20 to 250mm long.		5		Recovery: 97% RQD: 73%					5	
6					6		Recovery: 100% RQD: 63%					6	
7			Laminated SANDSTONE fine interbeds of grey and dark grey sandstone 20mm seam of grey silt and sand at 10.4 metres. 5° and 50° fractures from 9 to 10.39 metres (200 to 300mm pieces). Fracture along large calcite vein at 12.5 metres dipping at 60° . 40°, 60°, and 80° cemented calcite veins throughout. 12° fractures from 13 to 14.5 metres. Three (3) core pieces 600 to 1400mm long below 10 metres		7		Recovery: 100% RQD: 62%					7	
8					8		Recovery: 100% RQD: 92%					8	
9	-5.49		MICROCONGLOMERATE Thin layer between 14.5 and 14.52 metres with grains from 2mm to 20mm. Laminated SANDSTONE fine interbeds of grey and dark grey sandstone One (1) 12° tight fracture and , 40°, and 60° cemented calcite veins. End of borehole		9		Recovery: 98% RQD: 87%					9	
10	8.99				10		Recovery: 100% RQD: 100%					10	
11	-11.00											11	
12	-11.46												12
13	14.96											13	
14												14	
15												15	
16												16	
17												17	
18												18	

BOREHOLE-TEST 1743-1.GPJ JBAI.GDT 22 - 03 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 20 - 10 - 05	BOREHOLE NO: BH-3
PHASE 1 - CACOUNA ENERGY	DATE OF WATER LEVEL: 22 - 10 - 05	PROJECT NO: S-05-1743 (PHASE 1)
GROS CACOUNA, QUEBEC		ELEVATION: 3.40 m
SAMPLE TYPE <input checked="" type="checkbox"/> NQ CORE		
BACKFILL TYPE <input type="checkbox"/> SAND		

DEPTH(m)	ELEVATION DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	SLOTTED STANDPIPE	RECOVERY %		DEPTH(m)
									20	40 60 80	
0	3.10	OC	QUARRY FINES								0
1	0.30		Broken grey SANDSTONE bedrock (50 to 150 mm cores) 75 mm reddish brown seam at 1.25 metres.		1		Recovery: 94% RQD: 29%				1
2	2.28		grey fine grained SANDSTONE with broken cores along vertical calcite filled fractures between 2 to 4-metre depth. Cores - 500 mm long. Some small pieces 20 to 50 mm. 70° tight fractures (3)		2		Recovery: 97% RQD: 65%				2
3	1.12				3		Recovery: 43% RQD: 0				3
4	1.88				4		Recovery: 100% RQD: 95%				4
5	1.52		Solid MICROCONGLOMERATE with quartz and feldspar grains 2 to 10 mm in diameter Fractures: 1 x 12° and 1 x 70°		5		Recovery: 100% RQD: 62%				5
6	-0.74		SANDSTONE, laminated Thin calcite veins (<1mm thick) dipping at 70°		6		Recovery: 97% RQD: 82%				6
7	4.14		MICROCONGLOMERATE Quartz and feldspar grains from 2mm to 5mm SANDSTONE, laminated 20°, 60°, and 80° fractures.		7		Recovery: 100% RQD: 83%				7
8	-4.12		Significant fracturing between: 7 to 7.5 metres - 70° fracture joints 10 to 10.3 metres - 30° fracture joints		8						8
9	-4.45				9						9
10	7.85				10						10
11	-6.91		End of borehole		11						11
12	10.31				12						12
13					13						13
14					14						14
15					15						15
16					16						16
17					17						17
18					18						18

BOREHOLE-TEST 1743-1.GPJ JBAI.GDT 22 - 03 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 28 - 01 - 06	BOREHOLE NO: BH-4
PHASE 2 - CACOUNA ENERGY	DATE OF WATER LEVEL: 29 - 01 - 06	PROJECT NO: S-05-1743 (PHASE 2)
GROS CACOUNA, QUEBEC	Elev. adjusted for BH drilled @ 38° from horiz.	ELEVATION:
SAMPLE TYPE <input checked="" type="checkbox"/> NQ CORE		

BACKFILL TYPE

DEPTH (m)	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	TESTS	RECOVERY %				DEPTH (m)
								20	40	60	80	
0		△	PATHWAY: sand, and gravel fill.									0
1	0.84	△	(Elev. 23.12m) Fractured SANDSTONE bedrock Weathered 50° to 70° fractures and calcite veins		1		Recovery: 51% RQD: 6.9%					1
2					2		Recovery: 100% RQD: 8.3%					2
3					3		Recovery: 100% RQD: 23%					3
4					4		Recovery: 100% RQD: 78%					4
5	5.49		(Elev. 20.25m) Solid grey SANDSTONE bedrock 60° fractures and calcite veins Core pieces 600mm - 900mm (2-3') long. More fractured between 8.2m - 9.1m (27' to 30'). RDQ values reflect bedding and joint planes in the formation.		5		Recovery: 100% RQD: 85%					5
6					6		Recovery: 100% RQD: 56%					6
7					7		Recovery: 95% RQD: 70%					7
8					8		Recovery: 100% RQD: 70%					8
9					9		Recovery: 100% RQD: 88%					9
10					10		Recovery: 100% RQD: 80%					10
11					11		Recovery: 95% RQD: 76%					11
12					12		Recovery: 98% RQD: 85%					12
13					13		Recovery: 96% RQD: 63%					13
14					14		Recovery: 100% RQD: 88%					14
15					15		Recovery: 96% RQD: 75%					15
16	22.25	●	(Elev. 9.94m) Solid MICROCONGLOMERATE 60° fractures and calcite veins. One 1200mm (4') long core piece.		16		Recovery: 96% RQD: 83%					16
17	23.62	●	(Elev. 9.09m) Solid grey SANDSTONE 600mm (2') long core pieces. 60° fractures becoming more fractured in bottom 60 mm (2 feet). 24.1m (79'2"): Tight fracture with polished surface and striated slickensides.		17		Recovery: 95% RQD: 78%					17
18					18		Recovery: 100% RQD: 40%					18

BOREHOLE-TEST 1743-2 METRES.GPJ JBAI.GDT 19 - 04 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 28 - 01 - 06	BOREHOLE NO: BH-4
PHASE 2 - CACOUNA ENERGY	DATE OF WATER LEVEL: 29 - 01 - 06	PROJECT NO: S-05-1743 (PHASE 2)
GROS CACOUNA, QUEBEC	Elev. adjusted for BH drilled @ 38° from horiz.	ELEVATION:
SAMPLE TYPE <input checked="" type="checkbox"/> NQ CORE		

DEPTH(m)		DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	RECOVERY % 20 40 60 80	DEPTH(m)
28				(Elev. 6.56m)						28
29	28.58			Sandy SILTSTONE. 27.7 m (91') Short core with 2 intersecting fractures with slickensides. (continued)		19		Recovery: 63% RQD: 0% (Core barrel didn't latch properly)		29
30				(Elev. 6.04m)		20		Recovery: 98% RQD: 93%		30
31				Solid grey SANDSTONE 60° weathered fractures and calcite veins.		21		Recovery: 83% RQD: 28%		31
32	31.70			Two 600mm (2') long core pieces. (Elev. 4.12m)		22		Recovery: 100% RQD: 46%		32
33				SILTSTONE Thin polished and smooth fractures with soft grey-green chlorite deposits and slickensides between 31.7 - 32.1 m (104' - 105.5'). Minor weathering. Tight fractures.		23		Recovery: 100% RQD: 78%		33
34	34.14			(Elev. 2.62m)		24		Recovery: 100% RQD: 71% (Core crushed by drill for 1')		34
35				Solid grey SANDSTONE Approximately 200mm (8") to 600mm (2') core pieces throughout with one 1200mm (4') and two 900mm (3') core pieces. Core crushed by drill between 35.7m - 36m (117' - 118') and between 47m - 47.9m (155' - 157').		25		Recovery: 96% RQD: 83%		35
36	36.27					26		Recovery: 100% RQD: 86%		36
37						27		Recovery: 96% RQD: 88%		37
38						28		Recovery: 98% RQD: 98%		38
39						29		Recovery: 98% RQD: 83%		39
40						30		Recovery: 100% RQD: 85%		40
41						31		Recovery: 100% RQD: 26% (Core crushed by drill for 2')		41
42						32		Recovery: 100% RQD: 80%		42
43						33		Recovery: 96% RQD: 75%		43
44						34		Recovery: 98% RQD: 98%		44
45						35		Recovery: 93% RQD: 93%		45
46						36		Recovery: 97% RQD: 95%		46
47										47
48										48
49										49
50										50
51										51
52										52
53	52.60			Solid grey SANDSTONE (Elev. -8.75m)						53
54										54
55										55
56										56

BOREHOLE-TEST 1743-2_METRES.GPJ_JBAIGDT_19 - 04 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 28 - 01 - 06	BOREHOLE NO: BH-4
PHASE 2 - CACOUNA ENERGY	DATE OF WATER LEVEL: 29 - 01 - 06	PROJECT NO: S-05-1743 (PHASE 2)
GROS CACOUNA, QUEBEC	Elev. adjusted for BH drilled @ 38° from horiz.	ELEVATION:
SAMPLE TYPE <input checked="" type="checkbox"/> NQ CORE		

BACKFILL TYPE

DEPTH(m)	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	RECOVERY %				DEPTH(m)
								20	40	60	80	
56			Solid grey SANDSTONE (continued)		37		Recovery: 100% RQD: 100%					56
57	57.00		Boreholes grouted April 7 2006 to obtain water return for drill lubrication. Drilling continued April 12 to 15 2006.		38		Recovery: 96% RQD: 96%					57
58					39		Recovery: 100% RQD: 100%					58
59			Six (6) core pieces >900mm (3') Tight 60° fractures with minor calcite deposition throughout.		40		Recovery: 98% RQD: 98%					59
60					41		Recovery: 100% RQD: 100%					60
61					42		Recovery: 100% RQD: 100%					61
62					43		Recovery: 100% RQD: 94%					62
63												63
64	64.57		Tight fractures at 60° between 64.57m (211'10") and 64.62 (212') with minor weathering and calcite deposition.									64
65												65
66	65.63		End of borehole (Elev.-16.74)									66
67												67
68												68
69												69
70												70
71												71
72												72
73												73
74												74
75												75
76												76
77												77
78												78
79												79
80												80
81												81
82												82
83												83
84												84

BOREHOLE-TEST 1743-2 METRES.GPJ JBAI.GDT 19 - 04 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 07 - 02 - 06	BOREHOLE NO: BH-5
PHASE 3 - CACOUNA ENERGY	DATE OF WATER LEVEL: 10 - 02 - 06	PROJECT NO: S-05-1743 (PHASE 3)
GROS CACOUNA, QUEBEC		ELEVATION: 3.50 m
SAMPLE TYPE <input checked="" type="checkbox"/> NQ CORE		

BACKFILL TYPE

DEPTH(m)	ELEVATION DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	DEPTH(m)
0			Fractured grey SANDSTONE					0
1								1
2	1.85 1.65							2
3								3
4	0.15 3.35		Fractured dark grey silty SANDSTONE					4
5								5
6	-0.77 4.27		Solid grey SANDSTONE					6
7								7
8								8
9								9
10								10
11								11
12								12
13								13
14	-9.91 13.41		CONGLOMERATE Microconglomerate grading downward to conglomerate					14
15	-10.88 14.33		Solid grey SANDSTONE					15
16								16
17	-10.54							17
18								18

BOREHOLE-TEST 1743-3 (PHASE 3) METRES.GPJ JBAI.GDT 22 - 03 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 07 - 02 - 06	BOREHOLE NO: BH-6
PHASE 3 - CACOUNA ENERGY	DATE OF WATER LEVEL: 10 - 02 - 06	PROJECT NO: S-05-1743 (PHASE 3)
GROS CACOUNA, QUEBEC		ELEVATION: 3.50 m
SAMPLE TYPE <input checked="" type="checkbox"/> NQ CORE		

BACKFILL TYPE

DEPTH(m)	ELEVATION DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	DEPTH(m)
0			Fractured dark grey silty SANDSTONE					0
1	1.90							1
2	1.60							2
3	0.38		Solid grey SANDSTONE					3
4	3.12							4
5								5
6								6
7								7
8								8
9								9
10								10
11								11
12								12
13								13
14								14
15								15
16	-12.04		Solid SANDSTONE					16
	15.54		Weathered tight vertical fractures with calcite deposits					
	-12.58		CONGLOMERATE					
	16.25							
17	-13.34		Solid grey SANDSTONE					17
	16.84							
18								18

BOREHOLE-TEST 1743.3 (PHASE 3) METRES.GPJ JBA\GDT 22 - 03 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 08 - 02 - 06	BOREHOLE NO: BH-7
PHASE 3 - CACOUNA ENERGY	DATE OF WATER LEVEL: 10 - 02 - 06	PROJECT NO: S-05-1743 (PHASE 3)
GROS CACOUNA, QUEBEC	HQ core	ELEVATION: 3.50 m

SAMPLE TYPE NO RECOVERY NQ CORE

BACKFILL TYPE

DEPTH(m)	ELEVATION DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	RECOVERY %				DEPTH(m)
								20	40	60	80	
0	3.04		Blast rock and Fill		0		Boulders on surface					0
0.46	0.46		Fractured grey SANDSTONE bedrock									
1	2.13		grey SANDSTONE bedrock		1		Recovery: NA RQD: NA Blast affected rock					1
1.55	1.55		One 60 mm (2') long core piece, two 30 mm (1') long pieces, one 15 mm (6") piece. Solid near top and bottom with fractured rock (5 to 13 mm (2" to 5") core pieces) with highly weathered 60° and calcited 15° degree fractures.		2		Recovery: 97% RQD: 47%					2
4	-0.44		dark grey silty SANDSTONE		3		Recovery: 90% RQD: 57%					4
3.94	3.94		Tight fractures (45° and 60°) with striated slickensides at 4 metres (13') 2 mm (1") mud seam at 4 metres (13'3"). Highly fractured and weathered from 4 to 4.5 metres (13'3" to 14'9").		4		Recovery: 100% RQD: 57%					6
5.08	5.08		solid grey SANDSTONE		5		Recovery: 100% RQD: 85%					7
5			Thin calcite veins (60° and 80°).		6		Recovery: 97% RQD: 93%					9
7			5 to 5.9 metres (16'8" to 19'3"): 5 to 15 mm (2" to 6") core pieces with weathered fractures (Horizontal, 30° and 45°).		7		Recovery: 95% RQD: 92%					10
9			5.9 to 7.9 metres (19'3" to 25'11"): Mostly core pieces of 15 to 25 mm (6" to 10") with slightly weathered and calcited 30° fractures. Three core pieces less than 8 mm (3").		8		Recovery: 95% RQD: 88%					12
12	-8.39		SANDSTONE		9		Recovery: 100% RQD: 88%					13
11.89	11.89		11.9 metres (39'): Slickensides (striated) on 60° fracture. Highly weathered.		10		Recovery: 97% RQD: 97%					15
14	-10.09		12.4 metres (40'9"): 2 mm (1") zone of altered rock (chloritized) along 60° fracture.									14
13.59	13.59		12.4 metres (40'10"): Slickensides on 80° and 30° fracture. Slightly weathered.									15
15			solid grey SANDSTONE									16

BOREHOLE-TEST 1743-3 (PHASE 3) METRES.GPJ JBAI.GDT 22 - 03 - 06

SANDWELL EPC INC	DATE OF BOREHOLE: 08 - 02 - 06	BOREHOLE NO: BH-7
PHASE 3 - CACOUNA ENERGY	DATE OF WATER LEVEL: 10 - 02 - 06	PROJECT NO: S-05-1743 (PHASE 3)
GROS CACOUNA, QUEBEC	HQ core	ELEVATION: 3.50 m
SAMPLE TYPE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> NQ CORE		

BACKFILL TYPE

DEPTH(m)	ELEVATION DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT(N)	TESTS	RECOVERY %				DEPTH(m)
								20	40	60	80	
16			solid grey SANDSTONE (continued)		11		Recovery: 100% RQD: 95%					16
17												17
18	-14.28 17.93		2 mm (1") Conglomerate bed underlaid by 15 mm (6") of silty sandstone. solid grey SANDSTONE		12		Recovery: 97% RQD: 93%					18
19												19
20							Recovery: 100% RQD: 97%					20
21							Recovery: 97% RQD: 97%					21
22												22
23							Recovery: 95% RQD: 95%					23
24	-20.12 23.80		CONGLOMERATE solid grey SANDSTONE 30° fractures and calcite veins throughout. Some 80° calcite veins. One 1.2 metres (4') long core peice. Mostly 30 to 91 mm (1' to 3') long core pieces.		16		Recovery: 100% RQD: 93%					24
25												25
26							Recovery: 100% RQD: 100%					26
27							Recovery: 98% RQD: 93%					27
28												28
29							Recovery: 97% RQD: 97%					29
30							Recovery: 97% RQD: 97%					30
31	-27.26 30.76		End of borehole									31
32												32

BOREHOLE-TEST 1743.3 (PHASE 3) METRES.GPJ JBA\GDT 22 - 03 - 06