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REPORT OF BOREHOLE: CRR 207

SHEET: 1 OF 7

CLIENT: Aecom Australia Pty Ltd

COORDS: 503413.44 m E 6960804.21 m N MGA94 56

DRILL RIG: FD500

PROJECT: Cross River Rail

SURFACE RL: 3.95 m DATUM: AHD

CONTRACTOR: Foundril Pty Ltd

LOCATION: Riverbank Park

INCLINATION: -90°

LOGGED: CA

DATE: 20/8/10

JOB NO: 107632034

HOLE DEPTH: 51.42 m

CHECKED: NK

DATE: 18/10/10

Drilling				Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
ADT	L		0	3.95				CL	Silty Sandy CLAY low plasticity, dark grey, with some fine to coarse gravel	M	F	
			1						For Continuation Refer to Sheet 2			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									

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GAP gINT FN. F01a
RL3



REPORT OF BOREHOLE: CRR 207

SHEET: 2 OF 7

CLIENT: Aecom Australia Pty Ltd
PROJECT: Cross River Rail
LOCATION: Riverbank Park
JOB NO: 107632034

COORDS: 503413.44 m E 6960804.21 m N MGA94 56
SURFACE RL: 3.95 m DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 51.42 m

DRILL RIG: FD500
CONTRACTOR: Foundril Pty Ltd
LOGGED: CA DATE: 20/8/10
CHECKED: NK DATE: 18/10/10

Drilling					Field Material Description					Defect Information				
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) MPa	DEFECT DESCRIPTION & Additional Observations			FRACTURE FREQUENCY (Defects per unit metre length)	
				0										
				1	1.00		Continuation of Sheet 1							
				2	2.95		TUFF fine to coarse grained, pale red with some grey and yellow patches, porphyritic, massive, grey and pale red with white phenocrysts and dark grey lithic fragments, some brown staining in places	SW - FR		1.34: J, 55°, Un, Ro, Sn, dark grey 1.54: J, 30°, Un, Ro, Sn, white and orange 1.65: J, 40°, Pl, Ro, Sn, dark grey 1.69-1.79: FZ, 100 mm, highly fractured core, medium to coarse gravel sized rock fragments 1.79: J, 30°, Un, Ro, Sn, dark grey 1.79-1.89: J, 0°, Un, Ro, Sn, brown and dark grey 2.00: J, 20°, Un, Ro, Cn, orange and brown				
			70	55	2	2.00	CORE LOSS							
				3	1.95									
				4	2.43		TUFF fine to coarse grained, porphyritic, massive, grey and pale red with white phenocrysts and dark grey lithic fragments, some brown staining in places	SW - FR		2.44: J, 50°, Un, Ro, Sn, brown and dark grey 2.58: DB 2.65: DB 2.75: J, 30°, Un, Ro, Sn-Vr, orange brown 2.84: J, 40°, Un, Ro, Sn, dark red				
				5	1.52									
			75	60	3	3.00	CORE LOSS							
				6	3.31		TUFF porphyritic, massive, grey and pale red with white phenocrysts and dark grey lithic fragments, some brown staining in places	SW - FR		3.43: DB 3.51: J, 30°, Un, Sm, Sn-Vr, orange 3.75: J, 70°, Un, Ro, Sn-Vr, CL silty clay, dark brown				
				7	0.95									
			70	0	4	4.68	CORE LOSS			4.10: J, 40°, Un, Ro, Sn-Vr, CL silty clay, brown 4.20: J, 30°, Un, Ro, Sn-Vr, silty sand, brown 4.20-4.68: FZ, highly fractured core, fine to coarse gravel sized rock fragments with brown and orange staining 4.27: J, 0°, Un, Ro, Sn, orange				
				8	-0.73									
				9	-0.95		TUFF fine to coarse grained, porphyritic, massive, grey and pale red with white phenocrysts and dark grey lithic fragments, some brown staining in places	SW - FR		4.90-5.00: FZ, highly fractured core, coarse gravel sized rock fragments with orange staining				
			100	70	5			DW SW - FR		5.40-5.65: SZ, 70°, 25 mm, GW gravel, fine to coarse, angular, orange and dark brown staining				
				6						5.80-5.85: CS, 0°, 5 mm, GW gravel, fine to medium, angular, orange and dark brown staining 5.94: J, 30°, Un, Ro, Sn-Vr, silty sand, orange 6.06: J, 15°, Un, Ro, Sn-Vr, orange brown 6.10: J, 30°, Un, Ro, Ct, 1 mm, highly weathered rock infill, dark orange 6.14: J, 30°, Un, Ro, Ct, 1 mm, highly weathered rock infill, dark orange 6.44: J, 10°, Un, Ro, Cn, possible drilling break 6.89: J, 30°, Un, Ro, Cn, possible drilling break 6.93: J, 5°, Un, Ro, Sn, dark brown				
				7						7.21: HB				
				8				SW		7.48: J, random, Un, Ro, Cn, possible drilling break				
			100	100	8			FR		7.70-7.95: J, 80°, Un, Ro, Ct, CL silty clay, orange and dark brown, highly weathered joint				
				9						8.00-8.08: J, 0°, Un, Ro, Sn, orange 8.08: DB 8.20: J, 65°, Un, Ro, Sn, orange 8.39: DB				
			100	100	9	8.90	VESICULAR TUFF fine to coarse grained, pale red and grey with orange staining, vesicles up to 10 mm thickness	DW		8.72: DB 8.74: DB 8.81: J, 40°, Un, Ro, Cn, possible drilling break 8.97: HB 9.04: HB 9.18: DB 9.23: DL				
				10	-4.95					9.55: J, 30°, Un, Ro, Sn, orange 9.66-10.30: J, Un, Ro, Sn-Ct, Vertical, Un, Ro, Sn-Ct, CL silty clay, brown with orange staining, highly weathered joint				
			100	60	10	9.90								
					-5.95									

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GAP gINT FN. F02b
RL3



REPORT OF BOREHOLE: CRR 207

SHEET: 3 OF 7

CLIENT: Aecom Australia Pty Ltd
PROJECT: Cross River Rail
LOCATION: Riverbank Park
JOB NO: 107632034

COORDS: 503413.44 m E 6960804.21 m N MGA94 56
SURFACE RL: 3.95 m DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 51.42 m

DRILL RIG: FD500
CONTRACTOR: Foundril Pty Ltd
LOGGED: CA DATE: 20/8/10
CHECKED: NK DATE: 18/10/10

Drilling						Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) MPa	DEFECT DESCRIPTION & Additional Observations		FRACTURE FREQUENCY (Defects per unit metre length)	
				10			TUFF porphyritic, massive, grey with white phenocrysts and dark grey lithic fragments	DW		9.68: DB 9.73: J, 30°, Un, Ro, Ct, gravel, fine, angular, orange and dark brown			
				11				FR					
				12									
				13						12.97: DB 13.04: DB 13.16: DL			
				14						13.61-14.18: J, 85°, Un, Ro, Cn, possible drilling break			
				15						14.22: DB 14.74: DL 15.03: DB 15.23: J, 75°, Un, Ro, Sn, orange and dark brown			
				16						15.60: DB 15.80: HB 16.06-16.07: HB			
				17						16.30: DL 16.39: DB 16.48: J, 60°, Un, Ro, Sn, orange and dark brown 16.77: HB 17.03: HB 17.19: HB			
				18						17.67: DB 17.69: DB 17.93: DL 18.29: HB 18.46: HB			
				19						18.90: HB 19.30: HB 19.49: DL			
				20									

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GAP gINT FN. F02b
RL3



REPORT OF BOREHOLE: CRR 207

SHEET: 4 OF 7

CLIENT: Aecom Australia Pty Ltd

COORDS: 503413.44 m E 6960804.21 m N MGA94 56

DRILL RIG: FD500

PROJECT: Cross River Rail

SURFACE RL: 3.95 m DATUM: AHD

CONTRACTOR: Foundril Pty Ltd

LOCATION: Riverbank Park

INCLINATION: -90°

LOGGED: CA

DATE: 20/8/10

JOB NO: 107632034

HOLE DEPTH: 51.42 m

CHECKED: NK

DATE: 18/10/10

Drilling					Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{s(50)}$ MPa	DEFECT DESCRIPTION & Additional Observations		FRACTURE FREQUENCY (Defects per unit metre length)
								EL 0.03 VL 0.1 J 0.1 M 0.3 H 1 VH 3 EH				5 10 15 20 25 30
HMLC			100 100	20			TUFF porphyritic, massive, grey with white phenocrysts and dark grey lithic fragments	FR		20.20: HB		
				21						20.77: HB		
										21.00-21.05: DL		
				22						22.14: HB		
			100 100							22.32: HB		
				23						23.03: HB		
				24						23.97: DL		
				24.50	-20.55		becoming dark grey			24.41: HB		
										24.62: HB		
										24.79: HB		
										24.98: HB		
										25.17: HB		
NMLC			100 100							25.22: HB		
										25.53: DB		
				26								
				27						26.90: DL		
										27.25: DB		
										27.32: DB		
										27.39: J, 15°, Un, Sm, Ct, 10 mm, CL silty clay, dark grey		
										27.53: J, 15°, Un, Sm, Ct, 5 mm, very low strength rock infill, dark grey		
										27.98: HB		
										28.15: J, 60°, Pl, Sm, Cn, possible drilling break along vein		
			100 95	28.51	-24.56		MUDSTONE fine grained, grey and dark grey, subhorizontal bedding, grading to SANDSTONE medium grained, grey at 28.90 m			28.51: C, 0°, Un, Sm, Ct, CH clay, grey		
				29.08	-25.13		Interbedded CONGLOMERATE fine to coarse grained, polymictic, dark grey to black matrix with subangular quartz and lithic clasts; and SANDSTONE, coarse grained, grey			28.56: J, 30°, Un, Sm, Vr		
										28.60: X, 0°, Pl, Sm, Ct, CH clay, dark grey		
										28.63: DB		
										28.84: X, 0°, Pl, Sm, Ct, CH clay, dark grey		
										28.95: J, 20°, Un, Sl, Cn		
				29.82	-25.87					29.83: J, 45°, Un, Sm, Cn, possible drilling break		
			100 95	30								

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GAP gINT FN. F02b
RL3



REPORT OF BOREHOLE: CRR 207

SHEET: 5 OF 7

CLIENT: Aecom Australia Pty Ltd

COORDS: 503413.44 m E 6960804.21 m N MGA94 56

DRILL RIG: FD500

PROJECT: Cross River Rail

SURFACE RL: 3.95 m DATUM: AHD

CONTRACTOR: Foundril Pty Ltd

LOCATION: Riverbank Park

INCLINATION: -90°

LOGGED: CA

DATE: 20/8/10

JOB NO: 107632034

HOLE DEPTH: 51.42 m

CHECKED: NK

DATE: 18/10/10

Drilling						Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) MPa	DEFECT DESCRIPTION & Additional Observations		FRACTURE FREQUENCY (Defects per unit metre length)	
				30			Interbedded MUDSTONE fine grained, grey and dark grey, subhorizontal bedding; and SANDSTONE, fine to coarse grained, grey	FR		29.92: X, 5°, Un, Sm, Vr, rock fragments, platy, very low strength 29.95: DL 30.16: J, 5°, Pl, Ro, Cn 30.32: J, 30°, Un, Sm, Ct, CH clay, dark grey 30.51: J, 5°, Un, Sm, Ct, CH clay, pale grey 30.55: X, 5°, Un, Sm, Ct, CL silty clay, pale grey 30.58: X, 5°, Un, Sm, Cn, possible drilling break 30.59: X, 0°, Pl, Sm, Vr, CH clay, pale grey 30.75: DB 30.95: DB 31.26: HB			
		100	95	31	31.00 -27.05		CONGLOMERATE fine to coarse grained, polymictic, subangular to subrounded quartz and lithic clasts, grey, generally well cemented, clayey clasts in places			31.90: DB 32.00: DL 32.04: HB 32.47: HB 32.75: HB 33.13: HB			
				32									
			100	33	100								
				34						34.40: DL			
				35						35.17: HB			
		100	100	36	36.03 -32.08		Interbedded CLAYSTONE, fine grained, pale grey; and SANDSTONE, fine to coarse grained, grey			35.79: HB 35.93: HB 36.24-36.28: J, 40°, Un, 5 mm, cemented with hard clay, grey 36.30-36.35: CS, 50 mm, fine gravel sized rock fragments with some clay, platy, grey, extremely low strength 36.61: J, 15°, Pl, Sm, Vr 36.65-36.72: CS, 70 mm, fine gravel sized rock fragments with some clay, platy, grey, very low strength 36.83: J, 10°, Un, Sm, Vr, clayey rock fragments, fine gravel sized, grey, platy, very low strength 36.88: DB 36.96: DB 37.50-37.52: 20 mm, possible CS with fines washed out in drilling water 37.70: HB 37.89: HB 37.97: HB 38.33: HB 38.74: HB 38.83: HB 38.90: DL 38.95: J, 30°, Un, Ro, Cn			
				37	37.07 -33.12		CONGLOMERATE fine to coarse grained, polymictic, subangular to subrounded quartz and lithic clasts, grey, generally well cemented, clayey clasts in places; and some interbedded SANDSTONE, fine to coarse grained, grey						
			100	38									
				39									
		100	100	40									

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GAP gINT FN. F02b
RL3



DRILL RIG: FD500

CONTRACTOR: Foundril Pty Ltd

LOGGED: CA DATE: 20/8/10

CHECKED: NK DATE: 18/10/10

CLIENT: Aecom Australia Pty Ltd

COORDS: 503413.44 m E 6960804.21 m N MGA94 56

PROJECT: Cross River Rail

SURFACE RL: 3.95 m DATUM: AHD

LOCATION: Riverbank Park

INCLINATION: -90°

JOB NO: 107632034

HOLE DEPTH: 51.42 m

Drilling					Field Material Description					Defect Information				
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) MPa	DEFECT DESCRIPTION & Additional Observations			FRACTURE FREQUENCY (Defects per unit metre length)	
NMLC			100	100	40		CONGLOMERATE fine to coarse grained, polymictic, subangular to subrounded quartz and lithic clasts, grey, generally well cemented, clayey clasts in places; and some interbedded SANDSTONE, fine to coarse grained, grey	FR		40.12: HB				
				41	41.30 -37.35		SANDSTONE fine to coarse grained, grey; some interbedded MUDSTONE, fine grained, dark grey, bedding at 0-15 deg			40.37: V, 30°, Un, 5 mm, black, blocky, reflective, hard and brittle 40.64: V, 0°, 5 mm, black, blocky, reflective, hard and brittle				
				42	42.30 -38.35		CONGLOMERATE fine to coarse grained, polymictic, subangular to subrounded quartz and lithic clasts, grey, generally well cemented, clayey clasts in places; and some interbedded SANDSTONE, fine to coarse grained, grey			41.31: C, 30° 41.50: DL 41.85: DB 41.95: HB 42.22: DB 42.45: J, 75°, Un, Ro, Cn, possible drilling break				
			100	100	43		42.84: HB 42.92: HB 43.11: HB 43.30: V, 20°, 3 mm, black, blocky, reflective, hard and brittle 43.68: DB 43.88: DB 44.00: DL 44.16: V, 20°, 3 mm, black, blocky, reflective, hard and brittle 44.26: DB							
				44										
			100	100	45									
				46			45.96: HB 46.02: HB							
				47			47.00: DL 47.02: J, 20°, Un, Ro, Cn, fines washed out by drilling water, possible drilling break 47.20: DB 47.39: HB							
				48			47.86: HB 47.99: HB 48.09: HB							
			100	100	49		48.28: V, 20°, Un, black, blocky, reflective, hard and brittle							

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GAP gINT FN. F02b
RL3



REPORT OF BOREHOLE: CRR 207

SHEET: 7 OF 7

CLIENT: Aecom Australia Pty Ltd

COORDS: 503413.44 m E 6960804.21 m N MGA94 56

DRILL RIG: FD500

PROJECT: Cross River Rail

SURFACE RL: 3.95 m DATUM: AHD

CONTRACTOR: Foundril Pty Ltd

LOCATION: Riverbank Park

INCLINATION: -90°

LOGGED: CA

DATE: 20/8/10

JOB NO: 107632034

HOLE DEPTH: 51.42 m

CHECKED: NK

DATE: 18/10/10

Drilling					Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH Is(50) MPa	DEFECT DESCRIPTION & Additional Observations		FRACTURE FREQUENCY (Defects per unit metre length)
NMLC		85	85	50			CONGLOMERATE fine to coarse grained, polymictic, subangular to subrounded quartz and lithic clasts, grey, generally well cemented, clayey clasts in places; and some interbedded SANDSTONE, fine to coarse grained, grey	FR		50.44: DB		
				51						50.85: DB		
				51.22								
				47.27								
				51.42			CORE LOSS core slipped out end of barrel, still down hole					
				47.47			END OF BOREHOLE @ 51.42 m groundwater @ 3.9m 18/08/10; 3.0m groundwater 19/08/10					
				52								
				53								
				54								
				55								
				56								
				57								
				58								
				59								
				60								

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GAP gINT FN. F02b
RL3



REPORT OF CORE PHOTOGRAPHS: CRR 207

CLIENT: Aecom Australia Pty Ltd
PROJECT: Cross River Rail
LOCATION: Kangaroo Point
JOB NO: 107632034

COORDS: 0503413 m E 6960804m N
SURFACE RL: 3.95 DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 51.42 m

DEPTH RANGE: 1.34-17.0 m
DRILL RIG: FD500
DRILLER: Foundril Pty Ltd
LOGGED: CA DATE: 20/08/10
CHECKED: NK DATE: 4/10/10





REPORT OF CORE PHOTOGRAPHS: CRR 207

CLIENT: Aecom Australia Pty Ltd
PROJECT: Cross River Rail
LOCATION: Kangaroo Point
JOB NO: 107632034

COORDS: 0503413 m E 6960804m N
SURFACE RL: 3.95 DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 51.42 m

DEPTH RANGE: 17.0-32.0 m
DRILL RIG: FD500
DRILLER: Foundril Pty Ltd
LOGGED: CA DATE: 20/08/10
CHECKED: NK DATE: 4/10/10





REPORT OF CORE PHOTOGRAPHS: CRR 207

CLIENT: Aecom Australia Pty Ltd
PROJECT: Cross River Rail
LOCATION: Kangaroo Point
JOB NO: 107632034

COORDS: 0503413m E 6960804m N
SURFACE RL: 3.95 DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 51.42 m

DEPTH RANGE: 32.0-51.42 m
DRILL RIG: FD500
DRILLER: Foundril Pty Ltd
LOGGED: CA DATE: 20/08/10
CHECKED: NK DATE: 4/10/10





REPORT OF STANDPIPE INSTALLATION: CRR 207

SHEET: 1 OF 1

CLIENT: Aecom Australia Pty Ltd

COORDS: 503413.44 m E 6960804.21 m N MGA94 56

DRILL RIG: FD500

PROJECT: Cross River Rail

SURFACE RL: 3.95 m DATUM: AHD

CONTRACTOR: Foundril Pty Ltd

LOCATION: Riverbank Park

INCLINATION: -90°

LOGGED: CA

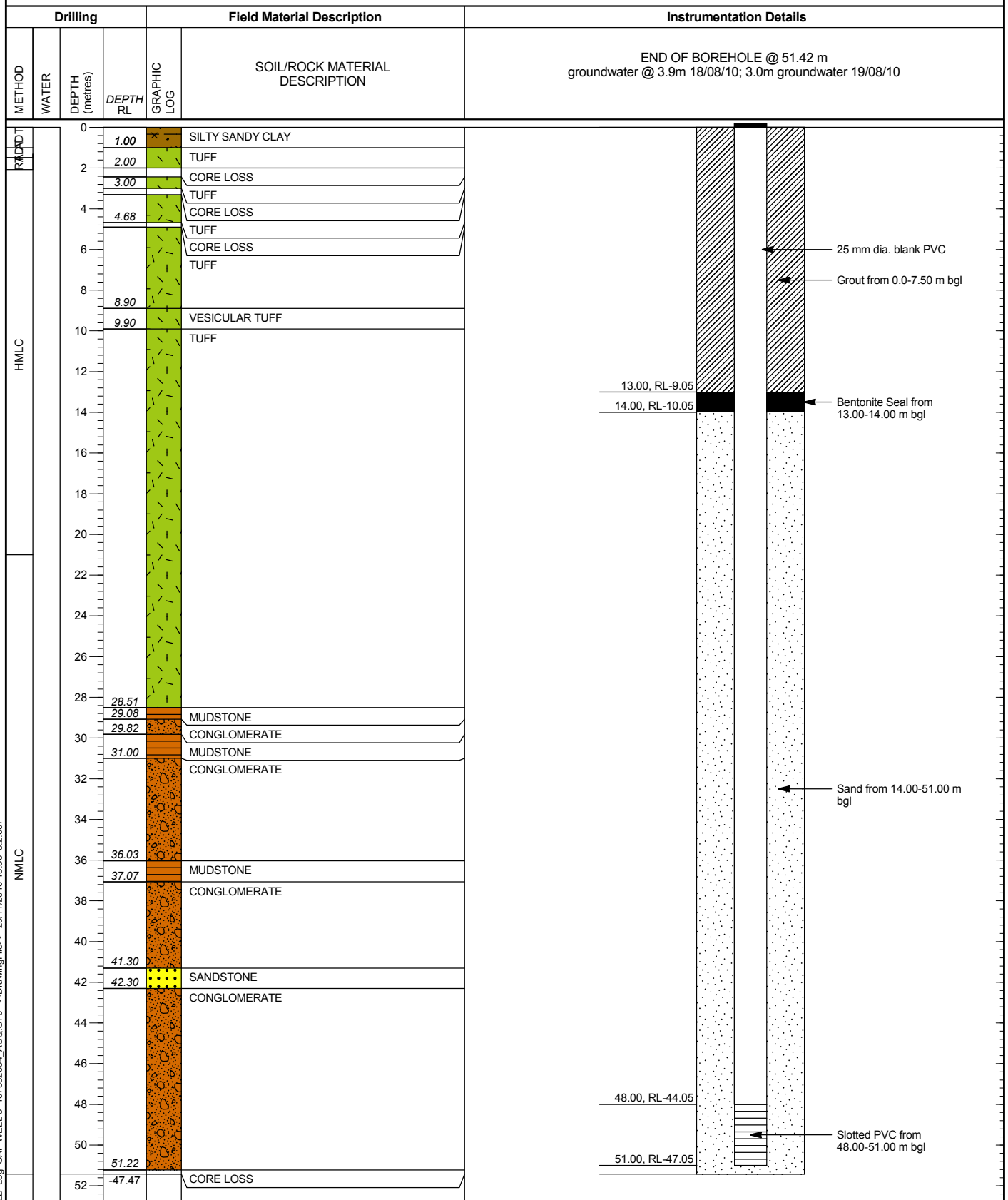
DATE: 20/8/10

JOB NO: 107632034

HOLE DEPTH: 51.42 m

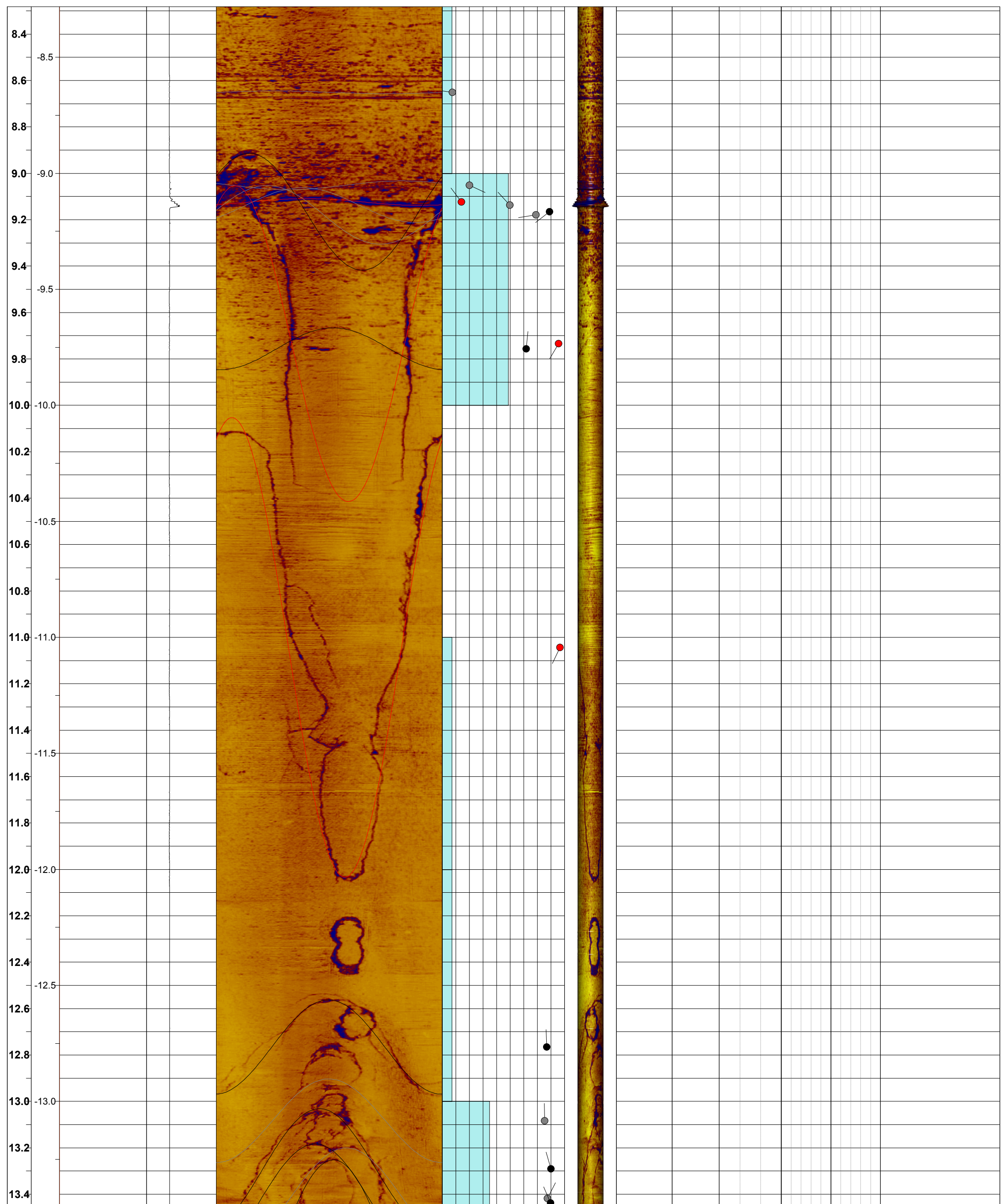
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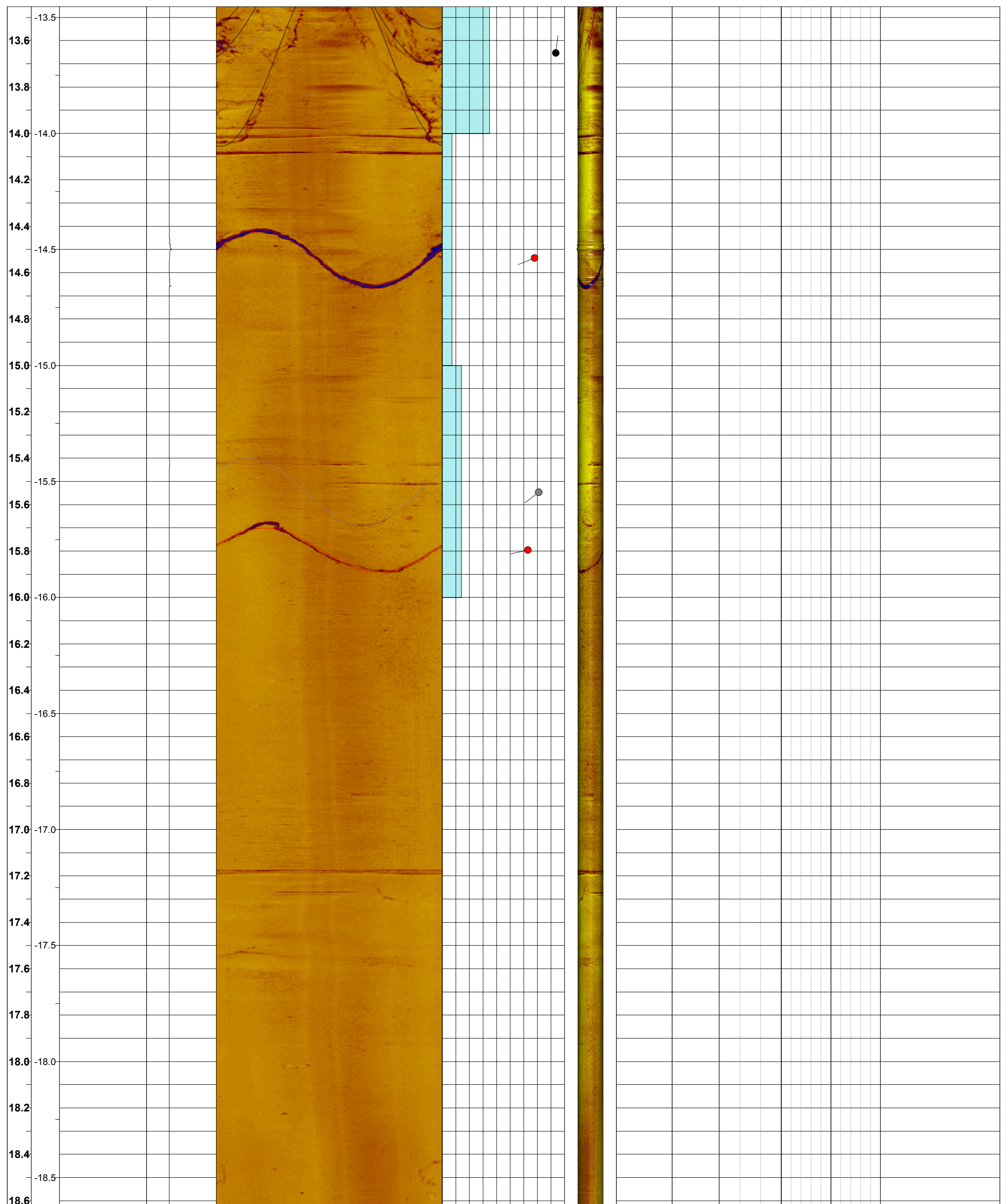
DATE: 18/10/10

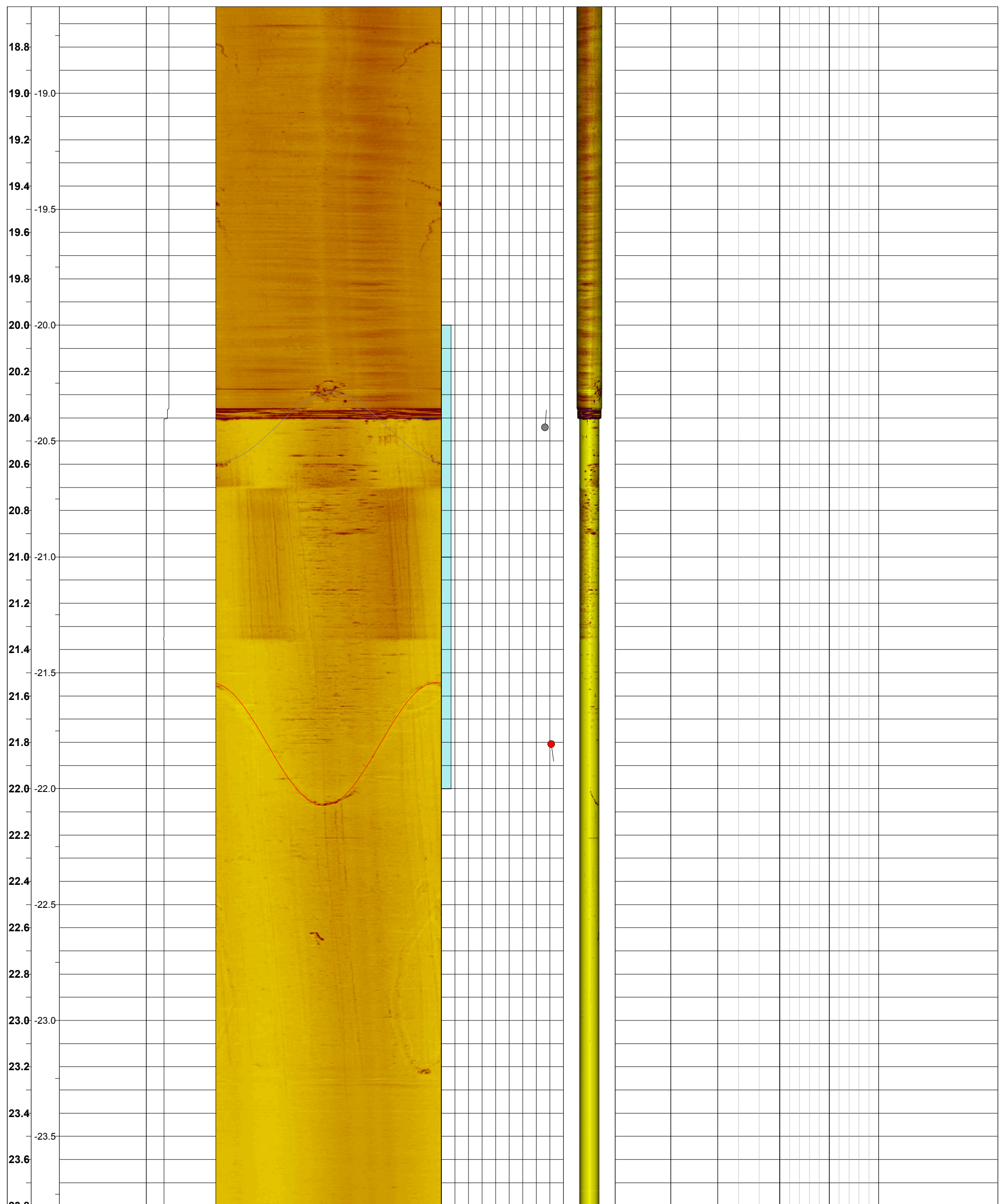


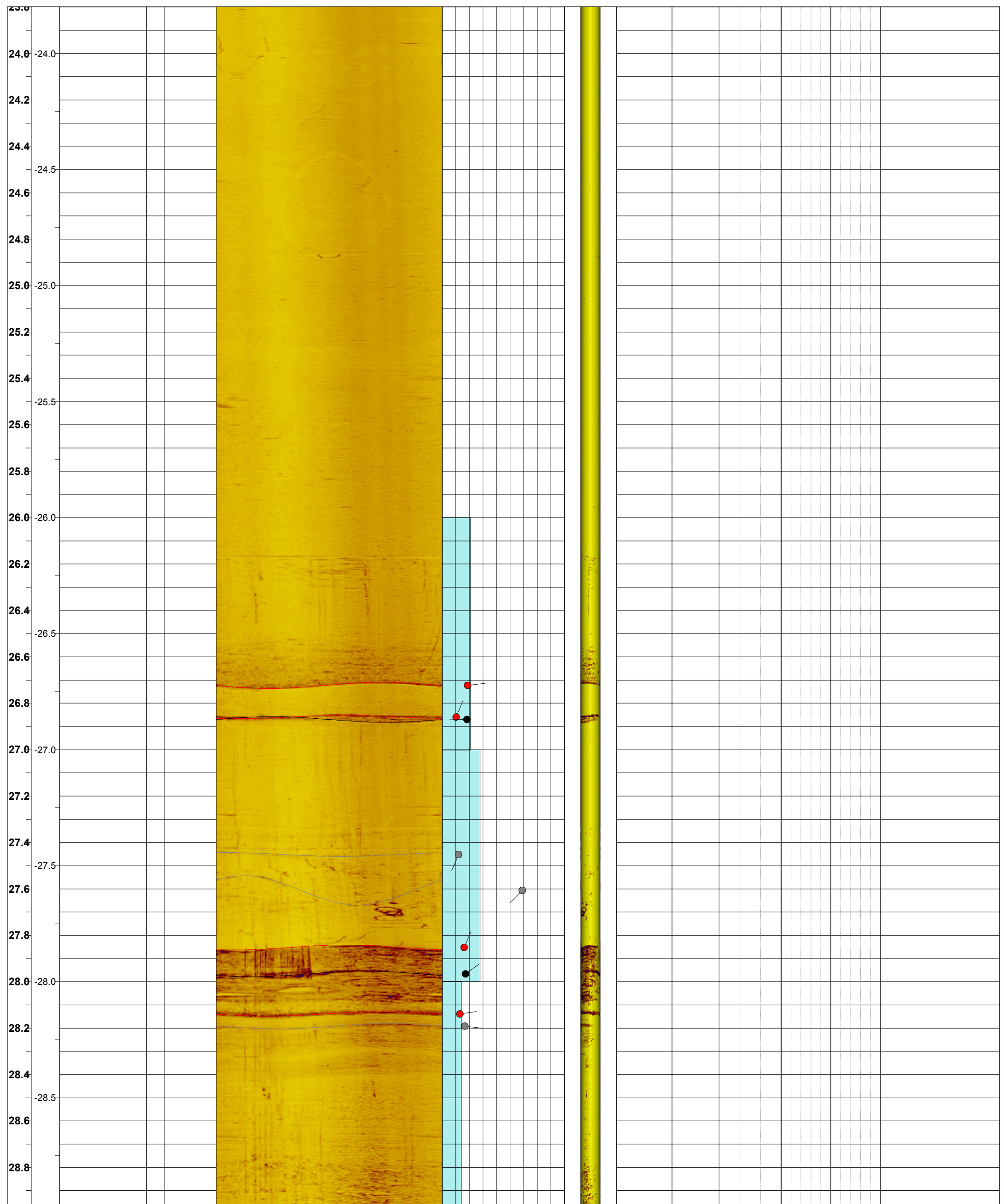
This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

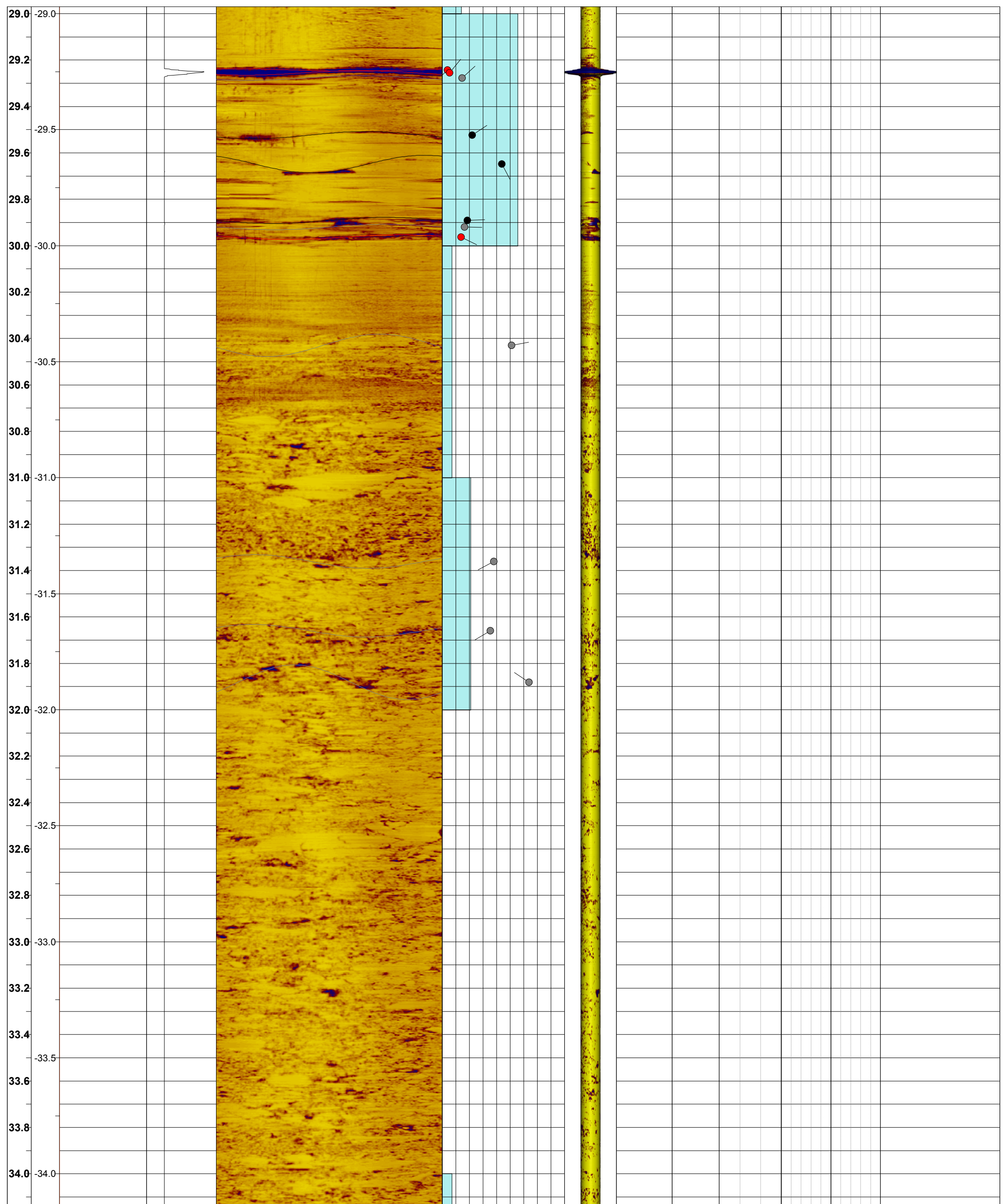
GAP gINT FN. F17
RL1

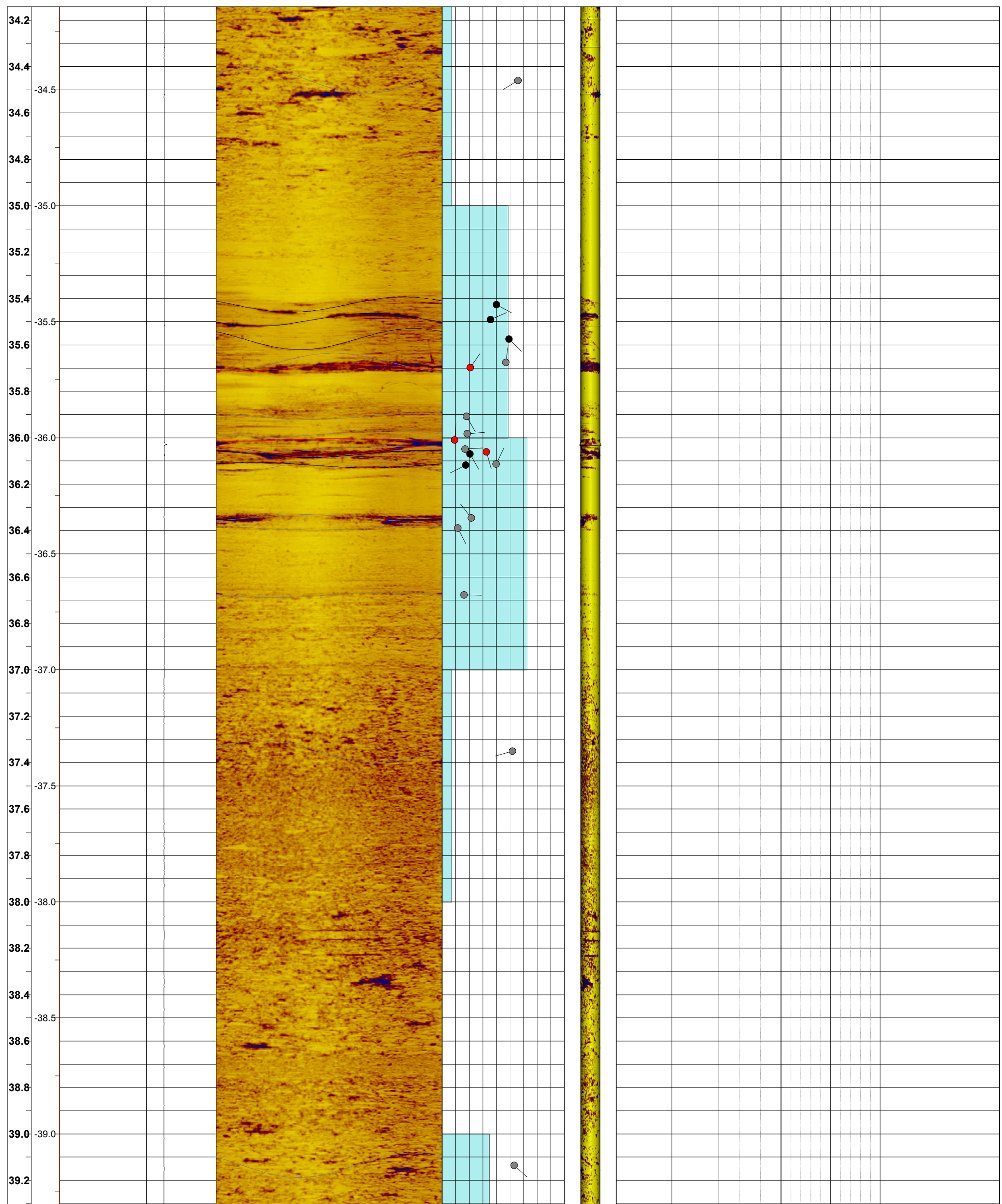


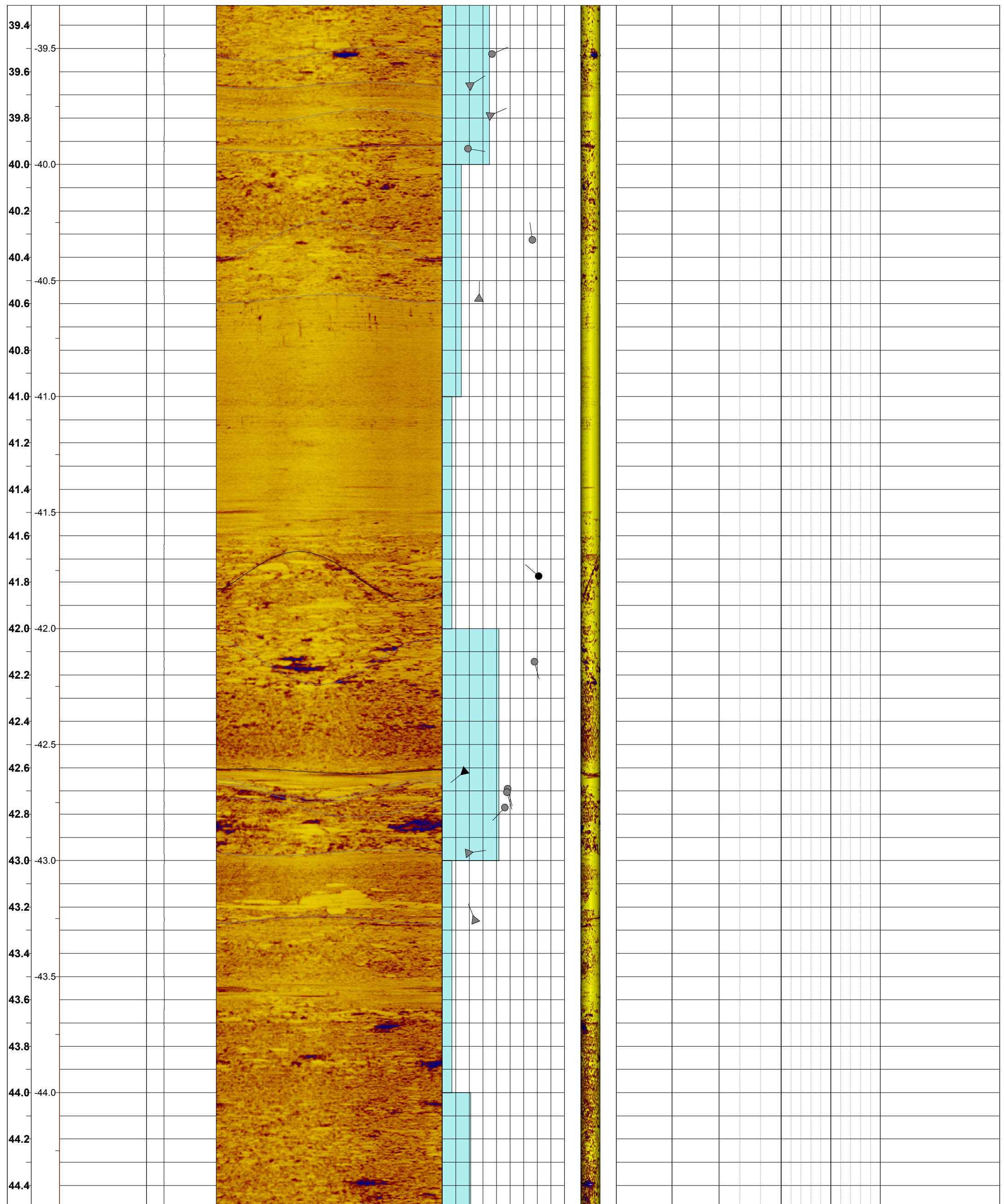


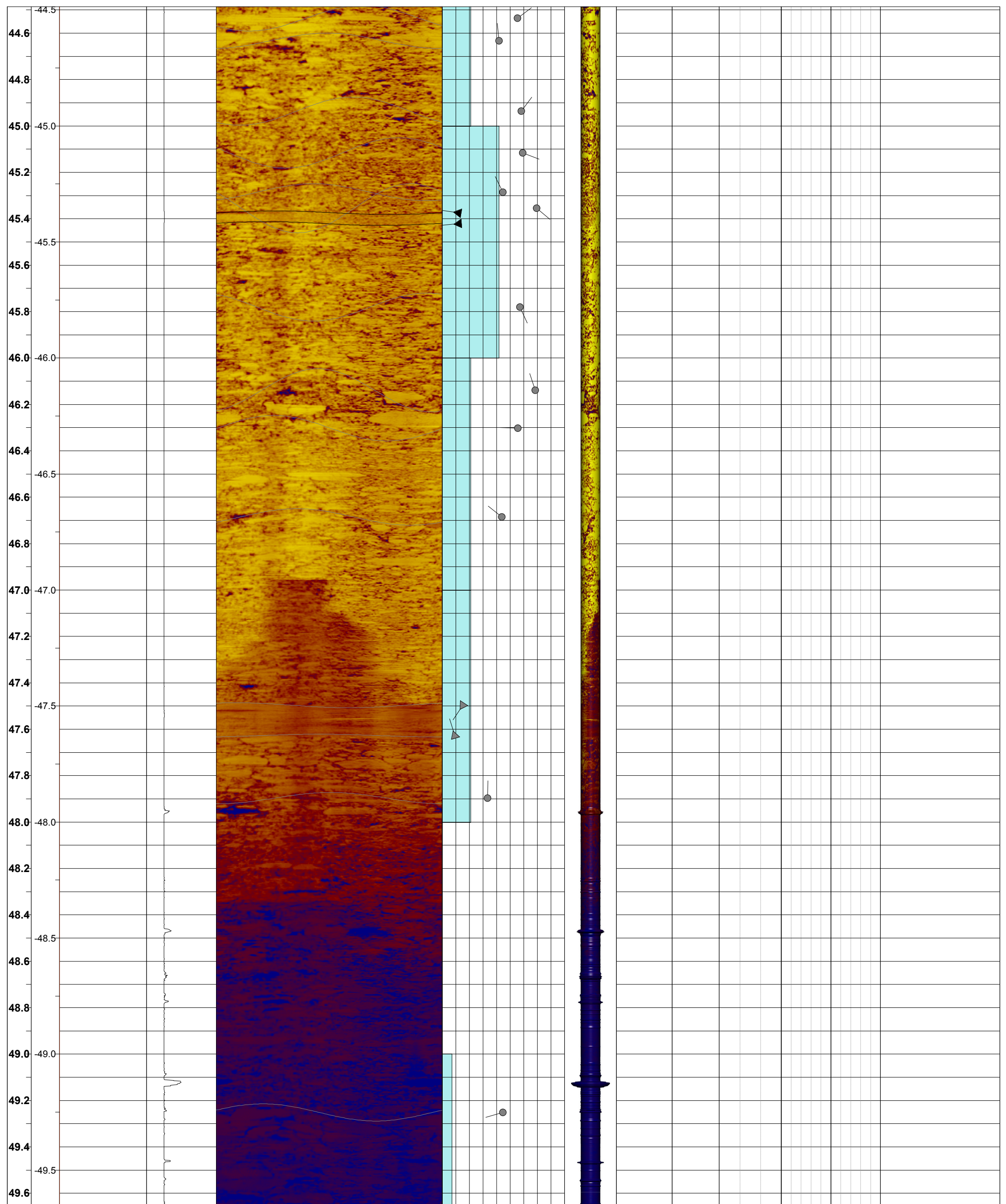


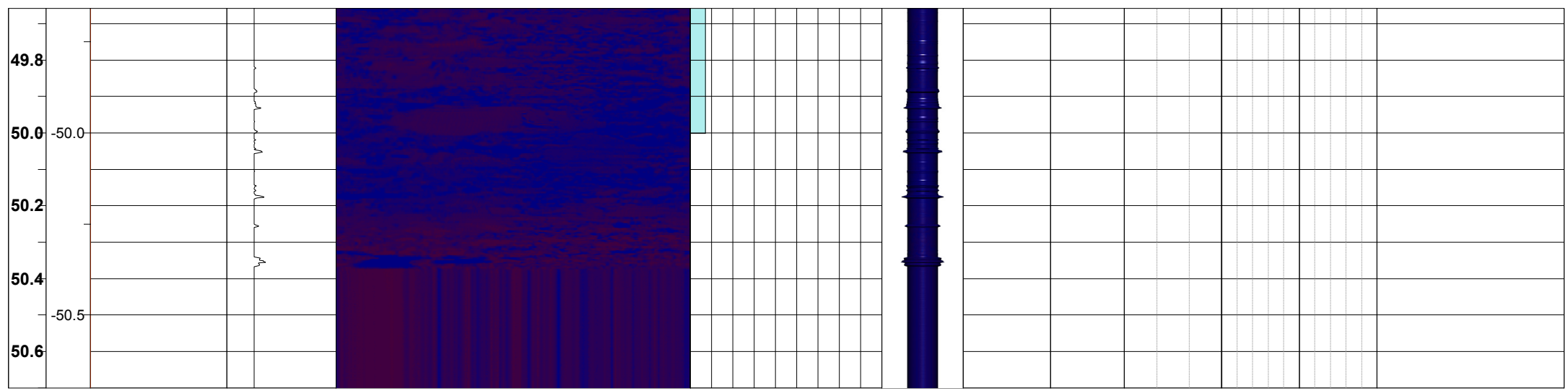


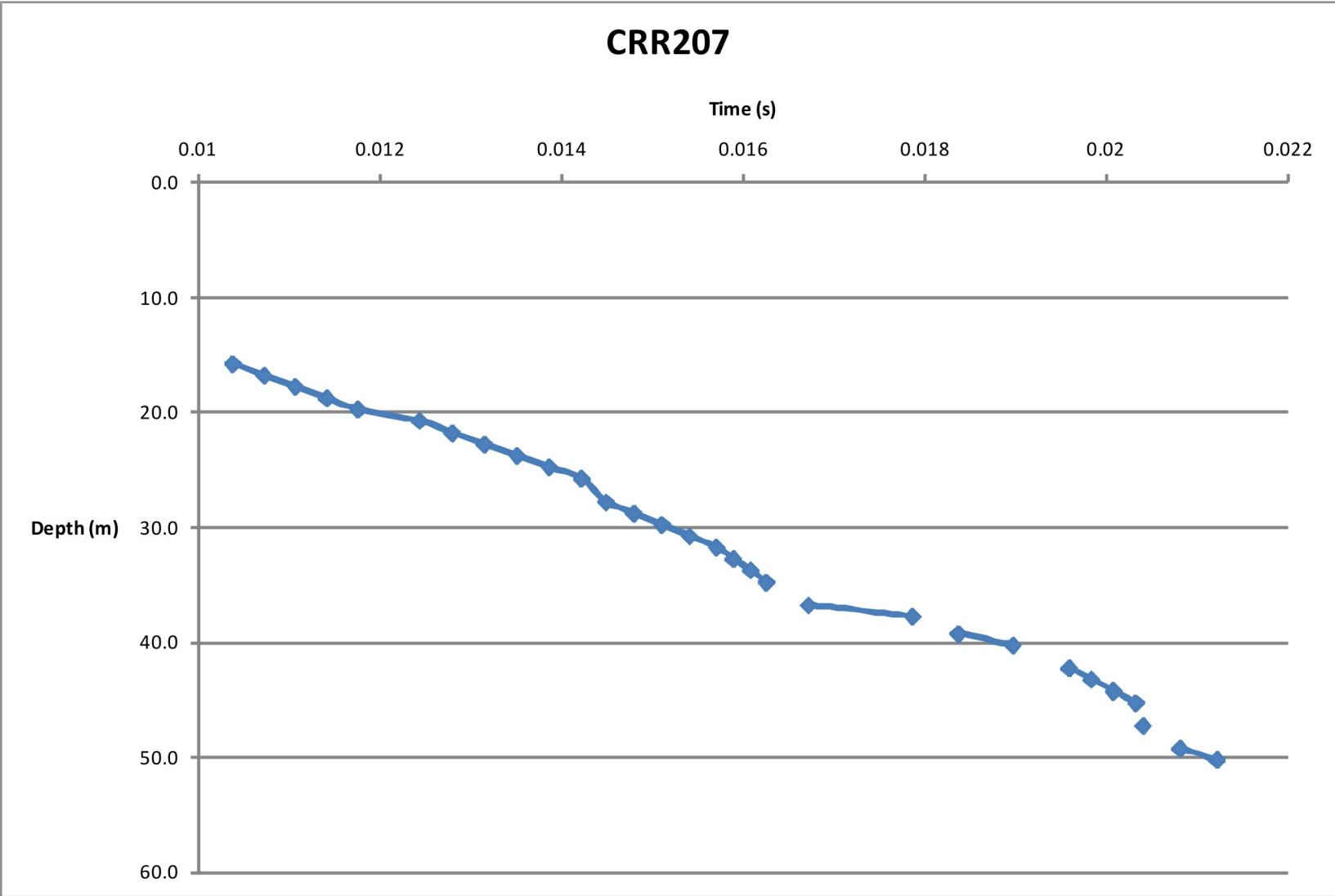












Note:

* - 1st arrival not clear due to noise

Calculations done without accounting for borehole deviation

Geophone Depth (m)		Interval velocity (P wave m/s)
from	to	
15.8	16.8	2888
16.8	17.8	2890
17.8	18.8	2891
18.8	19.8	2893
19.8	20.8	1471
20.8	21.8	2800
21.8	22.8	2800
22.8	23.8	2801
23.8	24.8	2802
24.8	25.8	2802
25.8	27.8	7466
27.8	28.8	3250
28.8	29.8	3250
29.8	30.8	3250
30.8	31.8	3401
31.8	32.8	5269
32.8	33.8	5270
33.8	34.8	5872
34.8	35.8	5872
35.8	36.8	*
36.8	37.8	873
37.8	38.8	*
38.8	39.3	*
39.3	40.3	1671
40.3	41.3	*
41.3	42.3	*
42.3	43.3	4111
43.3	44.3	4111
44.3	45.3	4112
45.3	46.3	*
46.3	47.3	*
47.3	48.3	*
48.3	49.3	*
49.3	50.3	2440



CLIENT Department of Transport and Main Roads		PROJECT Cross River Rail	
DRAWN GDK	DATE OCT 4	TITLE CRR207 VSP	
CHECKED TR	DATE		
SCALE NTS	PROJECT No 000-107632034	FIGURE No	REV No A3



WATER PRESSURE TEST

Job No. : 107632034	Hole No. : CRR207	Drilling Method : NMLC	Vertical depth to Groundwater	Revision No : 12.00
Client : AECOM	Dip (Deg) : -90	Hole Diameter (m) : 0.0757	Immediately prior to test (m bgl) : 3.90	
Project : Cross River Rail	Interval Top (m) : 22.00	Tested Length (m) : 10.00	Used in analysis (m bgl) : 3.90	
Location : Kangaroo Point	Interval Base (m) : 32.00	Packer Type : Mechanical - Non-Wireline - Single	Pressure Gauge Height (m agl) : 1.70	
Tested By : CJA	Computed By : CJA	Rock tested :	Presumed Water Temperature : 25	
Date : 18/08/2010	Date : 18/08/2010	Water Meter Reading in Litres	Checked By : NK	Date : 28/10/2010

Pressure Stage	Gauge Pressure kPa	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time (h:m:s)	Intervals (min)	Reading (Litres)		(L)	(L/min)	(L/min/m)		
P1	75	0	0:00:00	0	17765.90		0.00	0.00	0.00	c : 1	
		1	0:01:00	01:00	17766.65		0.75	0.75	0.08		
		2	0:02:00	01:00	17767.35		0.70	0.70	0.07		
		3	0:03:00	01:00	17768.05		0.70	0.70	0.07		
		4	0:04:00	01:00	17768.65		0.60	0.60	0.06		
		5	0:05:00	01:00	17769.25		0.60	0.60	0.06		
		6	0:06:00	01:00	17769.80		0.55	0.55	0.05		
		7	0:07:00	01:00	17770.40		0.60	0.60	0.06		
		8	0:08:00	01:00	17771.00		0.60	0.60	0.06		
		9	0:09:00	01:00	17771.65		0.65	0.65	0.07		
		10	0:10:00	01:00	17772.10		0.45	0.45	0.04		
		Total :						6.20	0.62		
		Average:						0.620	0.062		
P2	150	0	0:11:00	0	17773.60		0.00	0.00	0.00	c : 1	
		1	0:12:00	01:00	17774.20		0.60	0.60	0.06		
		2	0:13:00	01:00	17774.85		0.65	0.65	0.06		
		3	0:14:00	01:00	17775.50		0.65	0.65	0.07		
		4	0:15:00	01:00	17776.15		0.65	0.65	0.07		
		5	0:16:00	01:00	17776.75		0.60	0.60	0.06		
		6	0:17:00	01:00	17777.40		0.65	0.65	0.07		
		7	0:18:00	01:00	17777.95		0.55	0.55	0.05		
		8	0:19:00	01:00	17778.55		0.60	0.60	0.06		
		9	0:20:00	01:00	17779.15		0.60	0.60	0.06		
		10	0:21:00	01:00	17779.80		0.65	0.65	0.06		
		Total :						6.20	0.62		
		Average:						0.620	0.062		
P3	225	0	0:22:00	0	17782.00		0.00	0.00	0.00	c : 1	
		1	0:23:00	01:00	17782.65		0.65	0.65	0.07		
		2	0:24:00	01:00	17783.30		0.65	0.65	0.06		
		3	0:25:00	01:00	17783.95		0.65	0.65	0.07		
		4	0:26:00	01:00	17784.60		0.65	0.65	0.06		
		5	0:27:00	01:00	17785.25		0.65	0.65	0.07		
		6	0:28:00	01:00	17785.90		0.65	0.65	0.07		
		7	0:29:00	01:00	17786.50		0.60	0.60	0.06		
		8	0:30:00	01:00	17787.10		0.60	0.60	0.06		
		9	0:31:00	01:00	17787.70		0.60	0.60	0.06		
		10	0:32:00	01:00	17788.30		0.60	0.60	0.06		
		Total :						6.30	0.63		
		Average:						0.630	0.063		
P4	150	0	0:33:00	0	17790.00		0.00	0.00	0.00	c : 1	
		1	0:34:00	01:00	17790.55		0.55	0.55	0.05		
		2	0:35:00	01:00	17791.10		0.55	0.55	0.05		
		3	0:36:00	01:00	17791.65		0.55	0.55	0.06		
		4	0:37:00	01:00	17792.20		0.55	0.55	0.05		
		5	0:38:00	01:00	17792.75		0.55	0.55	0.05		
		6	0:39:00	01:00	17793.25		0.50	0.50	0.05		
		7	0:40:00	01:00	17793.80		0.55	0.55	0.05		
		8	0:41:00	01:00	17794.25		0.45	0.45	0.05		
		9	0:42:00	01:00	17794.70		0.45	0.45	0.05		
		10	0:43:00	01:00	17795.15		0.45	0.45	0.05		
		Total :						5.15	0.52		
		Average:						0.515	0.052		
P5	75	1	0:44:00	0	17795.50		0.00	0.00	0.00	c : 1	
		2	0:45:00	01:00	17795.80		0.30	0.30	0.03		
		3	0:46:00	01:00	17796.15		0.35	0.35	0.04		
		4	0:47:00	01:00	17796.45		0.30	0.30	0.03		
		5	0:48:00	01:00	17796.80		0.35	0.35	0.03		
		6	0:49:00	01:00	17797.10		0.30	0.30	0.03		
		7	0:50:00	01:00	17797.45		0.35	0.35	0.04		
		8	0:51:00	01:00	17797.75		0.30	0.30	0.03		
		9	0:52:00	01:00	17798.10		0.35	0.35	0.03		
		10	0:53:00	01:00	17798.40		0.30	0.30	0.03		
		11	0:54:00	01:00	17798.75		0.35	0.35	0.03		
		Total :						3.25	0.33		
		Average:						0.325	0.033		

TEST RESULTS

Stage No.	Houlsby (1976) Value	Lugeon Value Curve	Nett Pressures	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	0.8		129.9		H _{LOSS} 0.01 kPa
P2	0.4		204.9		Stage No. P3
P3	0.3		279.9		Gauge Pressure 225 kPa
P4	0.3		204.9		Q 0.63 L/min
P5	0.4		129.9		H 28.5 m
Houlsby (1976) method - no pressure corrections for Hf (head losses), nor is the pressure corrected for Hg (location of watertable).					Interpreted Result 0 uL
					Reported k at Stage P3
					Analytical Method 1: (ref = Golder geotechnical field notes draft 1997) $k = Q/H \times 6.10889 \times 10^{-6} \times (\log(2L/D))/L$
					k = 3.3E-08 m/s
					Analytical Method 2: (ref = Sharp, J.C 1975 Pit Slope Manual, CANMET report) $k = 1/(2L \times 3.14) \times (Q/H) \ln(R/r)$ m/s (convert L/min to m/s). Assume R = radius of influence of 100m & r = radius of borehole.
Flow Type	TURBULENT FLOW	COMMENTS	No Flow		k = 4.6E-08 m/s



WATER PRESSURE TEST

Job No. : 107632034	Hole No. : CRR207	Drilling Method : NMLC	Vertical depth to Groundwater	Revision No. : 12.00
Client : AECOM	Dip (Deg) : -90	Hole Diameter (m) : 0.0757	Immediately prior to test (m bgl) : 3.00	
Project : Cross River Rail	Interval Top (m) : 32.00	Tested Length (m) : 12.00	Used in analysis (m bgl) : 3.00	
Location : Kangaroo Point	Interval Base (m) : 44.00	Packer Type : Mechanical - Non-Wireline - Single	Pressure Gauge Height (m agl) : 1.70	
Tested By : CJA	Computed By : CJA	Rock tested :	Presumed Water Temperature : 25	
Date : 19/08/2010	Date : 19/08/2010	Water Meter Reading in Litres	Checked By : NK	Date : 28/10/2010

Pressure Stage	Gauge Pressure kPa	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time (h:m:s)	Intervals (min)	Reading (Litres)	(L)	(L/min)	(L/min/m)			
P1	75	0	0:00:00	0	17804.60	0.00	0.00	0.00	c : 1		
		1	0:01:00	01:00	17804.85	0.25	0.25	0.02			
		2	0:02:00	01:00	17805.10	0.25	0.25	0.02			
		3	0:03:00	01:00	17805.40	0.30	0.30	0.03			
		4	0:04:00	01:00	17805.70	0.30	0.30	0.02			
		5	0:05:00	01:00	17805.95	0.25	0.25	0.02			
		6	0:06:00	01:00	17806.20	0.25	0.25	0.02			
		7	0:07:00	01:00	17806.50	0.30	0.30	0.02			
		8	0:08:00	01:00	17806.70	0.20	0.20	0.02			
		9	0:09:00	01:00	17806.90	0.20	0.20	0.02			
		10	0:10:00	01:00	17807.15	0.25	0.25	0.02			
		Total :						2.55		0.21	
		Average:						0.255		0.021	
P2	150	0	0:11:00	0	17807.80	0.00	0.00	0.00	c : 1		
		1	0:12:00	01:00	17808.00	0.20	0.20	0.02			
		2	0:13:00	01:00	17808.25	0.25	0.25	0.02			
		3	0:14:00	01:00	17808.40	0.15	0.15	0.01			
		4	0:15:00	01:00	17808.65	0.25	0.25	0.02			
		5	0:16:00	01:00	17808.75	0.10	0.10	0.01			
		6	0:17:00	01:00	17808.95	0.20	0.20	0.02			
		7	0:18:00	01:00	17809.15	0.20	0.20	0.02			
		8	0:19:00	01:00	17809.30	0.15	0.15	0.01			
		9	0:20:00	01:00	17809.45	0.15	0.15	0.01			
		10	0:21:00	01:00	17809.65	0.20	0.20	0.02			
		Total :						1.85		0.15	
		Average:						0.185		0.015	
P3	225	0	0:22:00	0	17811.10	0.00	0.00	0.00	c : 1		
		1	0:23:00	01:00	17811.95	0.85	0.85	0.07			
		2	0:24:00	01:00	17812.80	0.85	0.85	0.07			
		3	0:25:00	01:00	17813.65	0.85	0.85	0.07			
		4	0:26:00	01:00	17814.55	0.90	0.90	0.07			
		5	0:27:00	01:00	17815.40	0.85	0.85	0.07			
		6	0:28:00	01:00	17816.25	0.85	0.85	0.07			
		7	0:29:00	01:00	17817.10	0.85	0.85	0.07			
		8	0:30:00	01:00	17817.95	0.85	0.85	0.07			
		9	0:31:00	01:00	17818.80	0.85	0.85	0.07			
		10	0:32:00	01:00	17819.60	0.80	0.80	0.07			
		Total :						8.50		0.71	
		Average:						0.850		0.071	
P4	150	0	0:33:00	0	17821.90	0.00	0.00	0.00	c : 1		
		1	0:34:00	01:00	17822.10	0.20	0.20	0.02			
		2	0:35:00	01:00	17822.25	0.15	0.15	0.01			
		3	0:36:00	01:00	17822.40	0.15	0.15	0.01			
		4	0:37:00	01:00	17822.60	0.20	0.20	0.02			
		5	0:38:00	01:00	17822.75	0.15	0.15	0.01			
		6	0:39:00	01:00	17822.90	0.15	0.15	0.01			
		7	0:40:00	01:00	17823.10	0.20	0.20	0.02			
		8	0:41:00	01:00	17823.30	0.20	0.20	0.02			
		9	0:42:00	01:00	17823.45	0.15	0.15	0.01			
		10	0:43:00	01:00	17823.60	0.15	0.15	0.01			
		Total :						1.70		0.14	
		Average:						0.170		0.014	
P5	75	1	0:44:00	0	17824.00	0.00	0.00	0.00	c : 1		
		2	0:45:00	01:00	17824.40	0.40	0.40	0.03			
		3	0:46:00	01:00	17824.75	0.35	0.35	0.03			
		4	0:47:00	01:00	17825.10	0.35	0.35	0.03			
		5	0:48:00	01:00	17825.50	0.40	0.40	0.03			
		6	0:49:00	01:00	17825.85	0.35	0.35	0.03			
		7	0:50:00	01:00	17826.25	0.40	0.40	0.03			
		8	0:51:00	01:00	17826.60	0.35	0.35	0.03			
		9	0:52:00	01:00	17826.85	0.25	0.25	0.02			
		10	0:53:00	01:00	17827.20	0.35	0.35	0.03			
		11	0:54:00	01:00	17827.60	0.40	0.40	0.03			
		Total :						3.60		0.30	
		Average:						0.360		0.030	

TEST RESULTS

Stage No.	Houlsby (1976) Value	Lugeon Value Curve	Nett Pressures	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	0.3		121.1		H _{LOSS} 0.00 kPa
P2	0.1		196.1		Stage No. Average
P3	0.3		271.1		Gauge Pressure 135 kPa
P4	0.1		196.1		Q 0.36 L/min
P5	0.4		121.1		H 18.5 m
Houlsby (1976) method - no pressure corrections for H _f (head losses), nor is the pressure corrected for H _g (location of watertable).					Interpreted Result 0 uL
					Reported k at Stage Average
					Analytical Method 1: (ref = Golder geotechnical field notes draft 1997) $k = Q/H \times 6.10889 \times 10^{-6} \times (\log(2L/D))/L$
					k = 2.5E-08 m/s
					Analytical Method 2: (ref = Sharp, J.C 1975 Pit Slope Manual, CANMET report) $k = 1/(2L \times 3.14) \times (Q/H) \ln(R/r)$ m/s (convert L/min to m/s). Assume R = radius of influence of 100m & r = radius of borehole.
Flow Type		COMMENTS	No Flow		k = 3.4E-08 m/s