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# REPORT OF BOREHOLE: CRR 208

SHEET: 2 OF 6

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Vulture St Off Ramp  
 JOB NO: 107632034

COORDS: 503296.44 m E 6959926.28 m N MGA94 56  
 SURFACE RL: 14.15 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 42.70 m

DRILL RIG: FOX B40  
 CONTRACTOR: Schneider Drilling Pty Ltd  
 LOGGED: RCD/MGM 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										
				2										
				3										
				4										
				5										
				6										
				7										
				8										
				8.80										
				5.35										
				9			Continuation of Sheet 1 TUFF fine to coarse grained, orange and white, large portion of rock mass has weathered to clay	EW - HW						
		100	0	10										

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GAP gINT FN. F02b  
RL3

GAP 8\_03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 08/12/2010 16:34 8.2.007



# REPORT OF BOREHOLE: CRR 208

SHEET: 3 OF 6

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Vulture St Off Ramp  
 JOB NO: 107632034

COORDS: 503296.44 m E 6959926.28 m N MGA94 56  
 SURFACE RL: 14.15 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 42.70 m

DRILL RIG: FOX B40  
 CONTRACTOR: Schneider Drilling Pty Ltd  
 LOGGED: RCD/MGM 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)	
								EL V L J M H V H	0.03 0.1 0.3 1 3 10 30				
		100	0	10			TUFF fine to coarse grained, orange and white, large portion of rock mass has weathered to clay	EW - HW					
				11									
				12									
		100	20	13									
				14									
				15	15.00 -0.85			TUFF fine with medium grained, orange brown pale grey and grey	DW - SW			13.45-13.55: J, 65°, Pl-Un, all clay above  14.23: J, 4°, Un, Ro, Sn, limonite 14.28: J, 21°, Pl, Ro, Sn, limonite 14.32: J, 45°, Un, Ro, Sn, limonite 14.50: DS, 0°, Un, Ro, Ct, 30 mm, clay & rock fragments 14.73: J, 70°, Un, Ro, Sn, limonite  15.28: DS, 10°, Un, Ro, Ct, 10 mm, clay & rock fragments 15.31: CS, Un, Ro, Ct, 50 mm, rock fragments 15.53: J, 10°, Un, Ro, Sn, limonite  15.87: J, 41°, Pl, Ro, Sn, limonite 16.06: J, 15°, Un, Ro, Sn, limonite 16.12: J, 3°, Un, Ro, Sn, limonite 16.28: J, 20°, Pl, Ro, Sn, limonite 16.31: J, 23°, Un, Ro, Sn, limonite 16.33: J, 4°, Un, Ro, Sn, limonite 16.60: DS, 5°, Un, Ro, Ct, 2 mm, clay & rock fragments 16.73: J, 30°, Pl, Ro, Sn, limonite 16.77: DS, 5°, Un, Ro, Ct, 3 mm, clay & rock fragments 16.86: J, 10°, Un, Ro, Sn, limonite 16.94: DS, 30°, Un, Ro, Ct, 2 mm, clay & rock fragments 16.98: DS, 5°, Un, Ro, Ct, 10 mm, clay & rock fragments	
				16									
				17	17.30 -3.15			grey, becoming more medium grained	FR				
		100	55	18									
				19									
		100	75	20	19.50 -5.35			some coarse grains					

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GAP gINT FN. F02b  
RL3

GAP 8.03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 08/12/2010 16:34 8.2.007



# REPORT OF BOREHOLE: CRR 208

SHEET: 4 OF 6

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Vulture St Off Ramp  
 JOB NO: 107632034

COORDS: 503296.44 m E 6959926.28 m N MGA94 56  
 SURFACE RL: 14.15 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 42.70 m

DRILL RIG: FOX B40  
 CONTRACTOR: Schneider Drilling Pty Ltd  
 LOGGED: RCD/MGM 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 $I_{s(50)}$ MPa	DEFECT DESCRIPTION & Additional Observations	FRACTURE FREQUENCY (Defects per unit metre length)
								EL 0.03 VL 0.01 J 0.1 M 0.3 H 1 VH 3 EH			5 10 15 20 25 30
			100	75	20		TUFF fine with medium grained, orange brown pale grey and grey	FR			
			100	80	22.50 -8.35 22.72 -8.57		SANDY CLAY grey, low plasticity	EW			
					23		SILTSTONE fine grained, grey and pale grey	FR			
					23.18 23.30		bands of sandstone				
					23.48 -9.33		SANDSTONE medium with coarse grained, pale grey bands dark grey				
					24		CONGLOMERATE fine to coarse grained, pale grey white dark grey				
			100	80	26		SILTSTONE fine grained, dark grey with pale grey bands				
					26.10 -11.95						
					27		META SILTSTONE fine grained, pale green grey with dark grey, foliation @ approximately 50°				
			100	70	27.00 -12.85						
					28						
					29						
			100	25	30						

21.70: J, 87°, Un, Ro, Cn  
 21.86: IS, 70°, Un, Ro, Ct, 2 mm, clay

23.37: B, 12°, Un, Ro, Sn, black mineral

26.40: DS, 8°, Un, Ro, Cn, 30 mm, clay

26.87: CS, 4°, Un, Sm-Ro, Cn, 114 mm, rock fragments

28.06: CS, 35°, Un, Ro, Ct, 60 mm, clay & rock fragments  
 28.30: CS, 63°, Un, Ro, Ct, 30 mm, clay & rock fragments  
 28.80: CS, 86°, Un, Sm, Ct, 10 mm, clay & rock fragments

29.13: X, Un, Sm, Ct, 1 mm, rock fragments  
 29.27: X, 37°, Un, Ro, Cn  
 29.55: X, 54°, Pl-Un, Sm, Cn  
 29.90: X, 50°, Un, Ro, Cn

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GAP gINT FN. F02b  
 RL3

GAP 8\_03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 08/12/2010 16:34 8.2.007



# REPORT OF BOREHOLE: CRR 208

SHEET: 5 OF 6

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Vulture St Off Ramp  
 JOB NO: 107632034

COORDS: 503296.44 m E 6959926.28 m N MGA94 56  
 SURFACE RL: 14.15 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 42.70 m

DRILL RIG: FOX B40  
 CONTRACTOR: Schneider Drilling Pty Ltd  
 LOGGED: RCD/MGM 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)
								EL 0.03 VL 0.03 J 0.1 M 0.3 H 1 VH 10 EH				5 10 15 20 25 30
		100	25	30	30.00		META SILTSTONE fine grained, pale green grey with dark grey, foliation @ approximately 50° foliation @ 80° numerous quartz bands	FR				
		100	70	31							31.25: CS, Un, Sm, Ct, 50 mm, clay & rock fragments	
		100	80	32							31.86: CS, 54°, Un, Sm, Ct, 3 mm, clay & rock fragments	
		100	85	33								
				34	34.00 -19.85		foliation @ 70°				34.28: CS, Un, Ro, Ct, 40 mm, rock fragments	
		100	85	36	36.00 -21.85		foliation @ 80°				36.47: X, 79°, Pl, Sm, Cn	
		100	100	39								
				40								

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GAP gINT FN. F02b  
RL3

GAP 8\_03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 08/12/2010 16:34 8.2.007



# REPORT OF BOREHOLE: CRR 208

SHEET: 6 OF 6

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Vulture St Off Ramp  
 JOB NO: 107632034

COORDS: 503296.44 m E 6959926.28 m N MGA94 56  
 SURFACE RL: 14.15 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 42.70 m

DRILL RIG: FOX B40  
 CONTRACTOR: Schneider Drilling Pty Ltd  
 LOGGED: RCD/MGM 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)	
			100	100	40		META SILTSTONE fine grained, pale green grey with dark grey, foliation @ approximately 50°	FR					
			95	95	41								
					42								
					42.70 -28.55		END OF BOREHOLE @ 42.70 m						
					43								
					44								
					45								
					46								
					47								
					48								
					49								
					50								

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GAP gINT FN. F02b  
RL3

GAP 8\_03 LIB: GLE Log GAP CORED BOREHOLE 107632034\_ACO.GPJ <<DrawingFile>> 08/12/2010 16:34 8.2.007



# REPORT OF CORE PHOTOGRAPHS: CRR 208

CLIENT: Aecom Australia Pty Ltd  
PROJECT: Cross River Rail  
LOCATION: Vulture St off ramp  
JOB NO: 107632034

COORDS: 0503296 m E 6959926 m N  
SURFACE RL: 14.15 DATUM: AHD  
INCLINATION: -90°  
HOLE DEPTH: 42.7 m

DEPTH RANGE: 8.80-26.00 m  
DRILL RIG: Fox B40  
DRILLER: Schneider Drilling Pty Ltd  
LOGGED: RCD/MGM DATE: 20/08/10  
CHECKED: NK DATE: 4/10/10





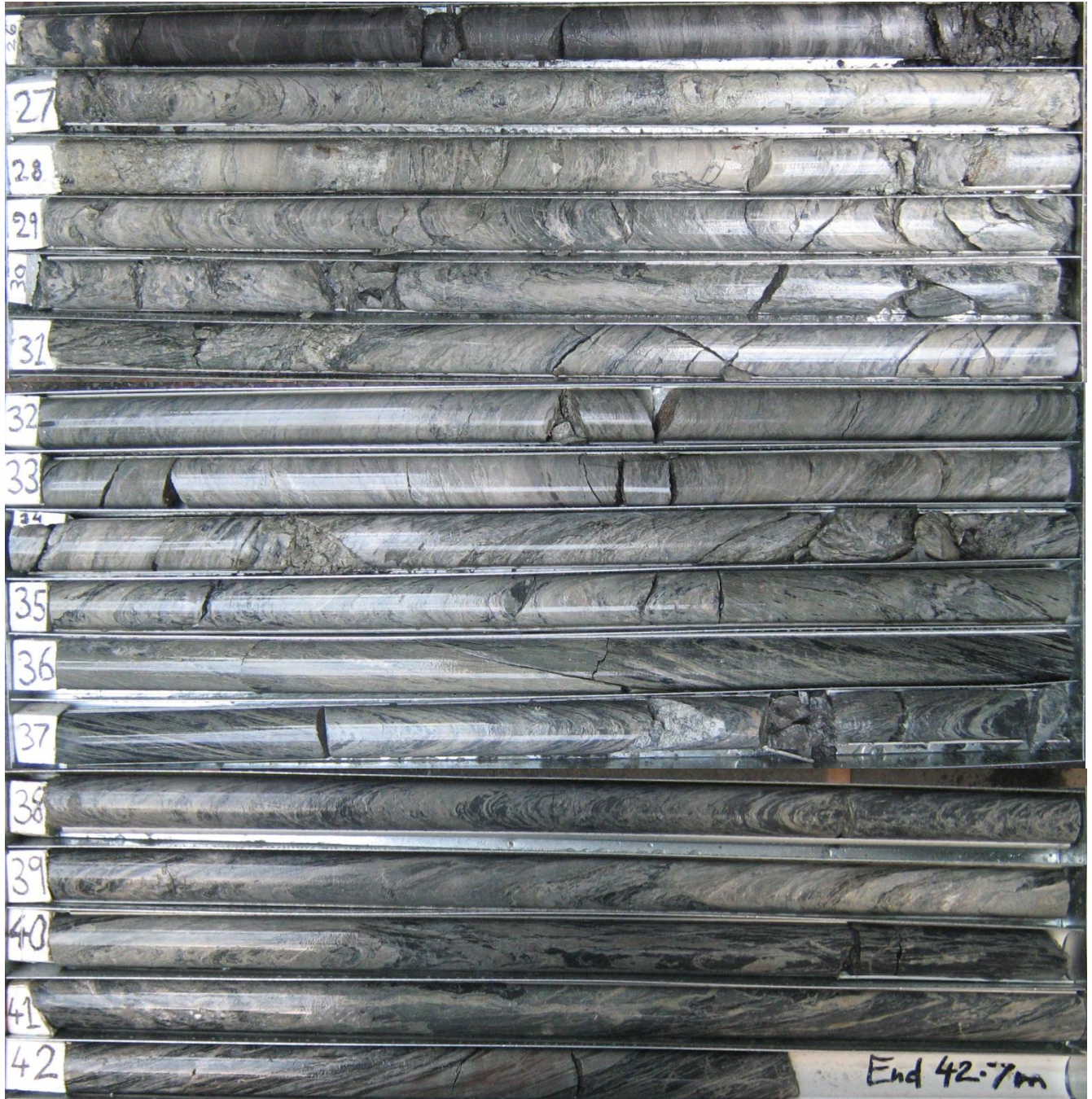


# REPORT OF CORE PHOTOGRAPHS: CRR 208

CLIENT: Aecom Australia Pty Ltd  
PROJECT: Cross River Rail  
LOCATION: Vulture St off ramp  
JOB NO: 107632034

COORDS: 0503296 m E 6959926 m N  
SURFACE RL: 14.15 DATUM: AHD  
INCLINATION: -90°  
HOLE DEPTH: 42.7 m

DEPTH RANGE: 26.0-42.7 m  
DRILL RIG: Fox B40  
DRILLER: Schneider Drilling Pty Ltd  
LOGGED: RCD/MGM DATE: 20/08/10  
CHECKED: NK DATE: 4/10/10





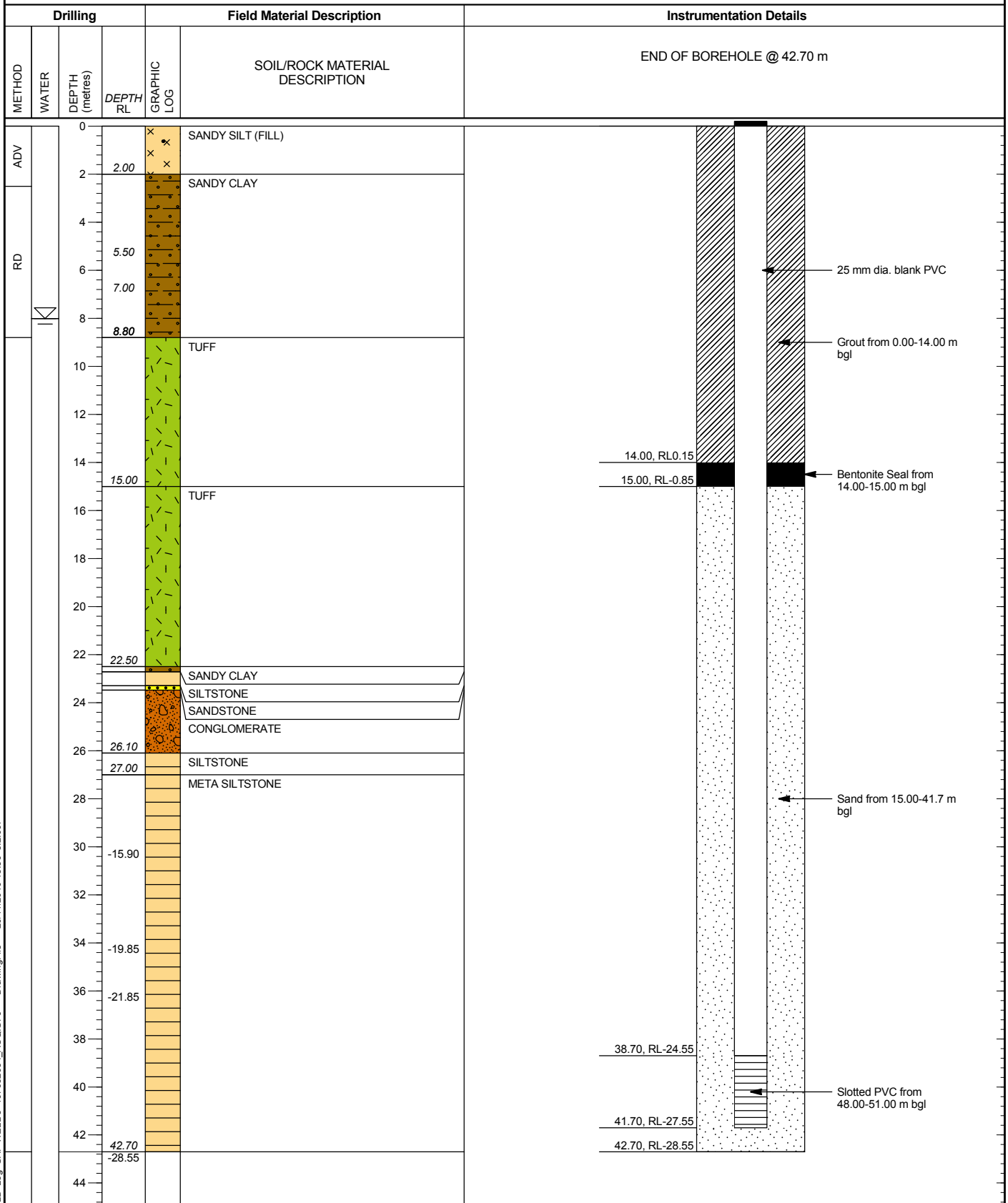
# REPORT OF STANDPIPE INSTALLATION: CRR 208

SHEET: 1 OF 1

CLIENT: Aecom Australia Pty Ltd  
 PROJECT: Cross River Rail  
 LOCATION: Vulture St Off Ramp  
 JOB NO: 107632034

COORDS: 503296.44 m E 6959926.28 m N MGA94 56  
 SURFACE RL: 14.15 m DATUM: AHD  
 INCLINATION: -90°  
 HOLE DEPTH: 42.70 m

DRILL RIG: FOX B40  
 CONTRACTOR: Schneider Drilling Pty Ltd  
 LOGGED: RCD/MGM DATE: 20/8/10  
 CHECKED: NK DATE: 18/10/10



GAP 8.03 LIB: GLE Log GAP WELL 3 107632034\_ACO.GPJ <-DrawingFile>> 29/11/2010 15:36 8.2.007

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.

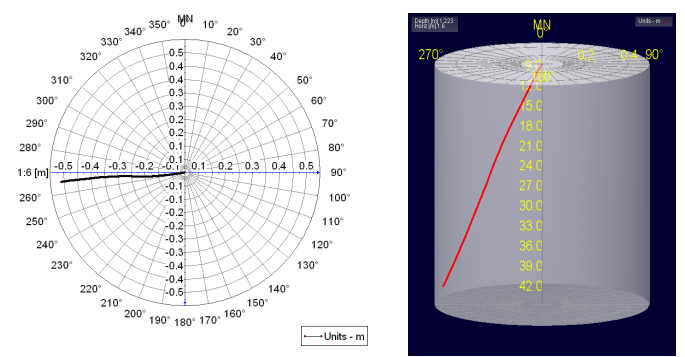
GAP gINT FN. F17  
RL1



**GEOPHYSICAL RECORD OF BOREHOLE: CRR 208**

PROJECT	Cross River Rail	PROJECT #	107632034
CLIENT	Department of Transport and Main Roads	DATE	11/10/2010

**DEVIATION DATA**

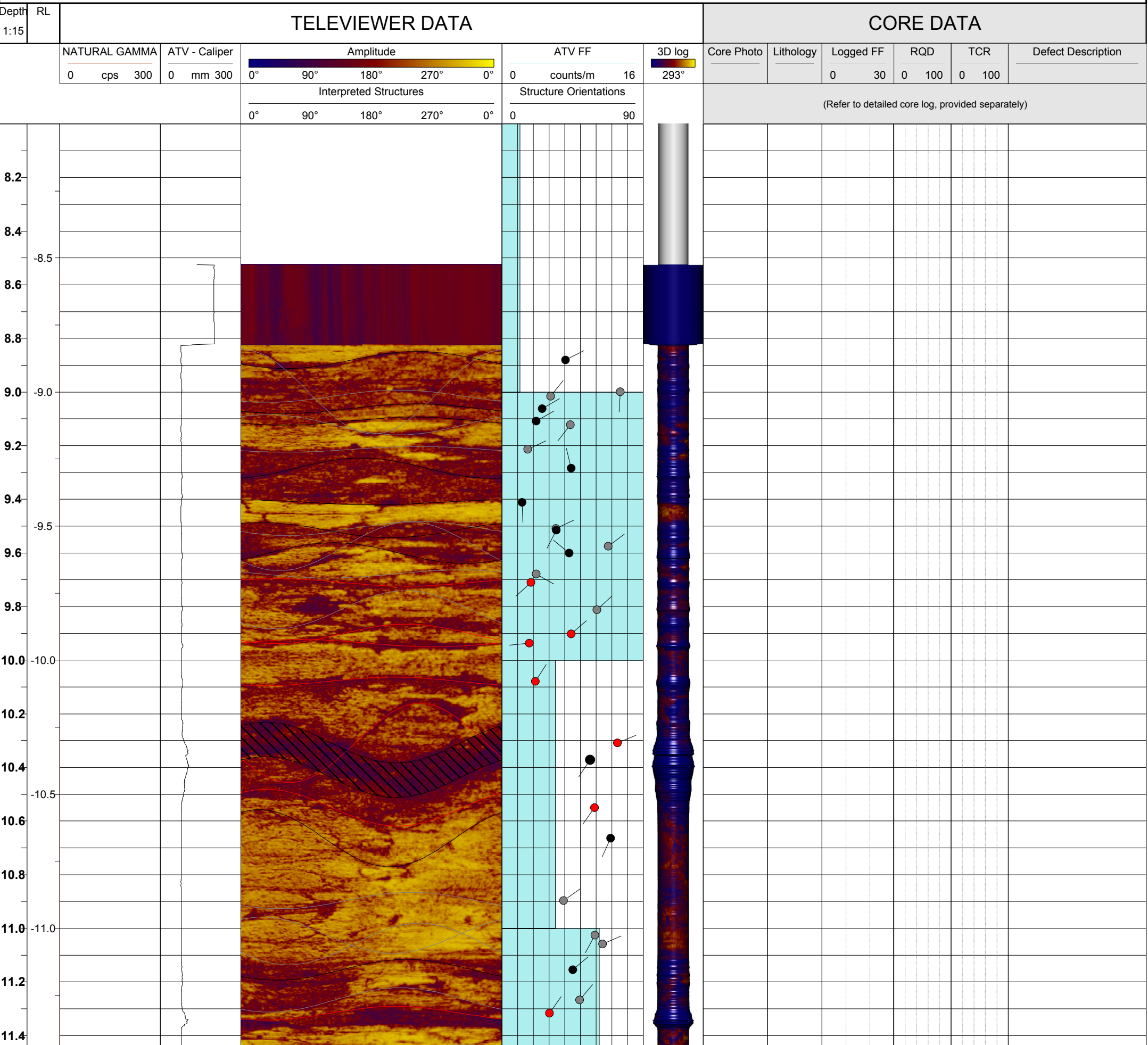


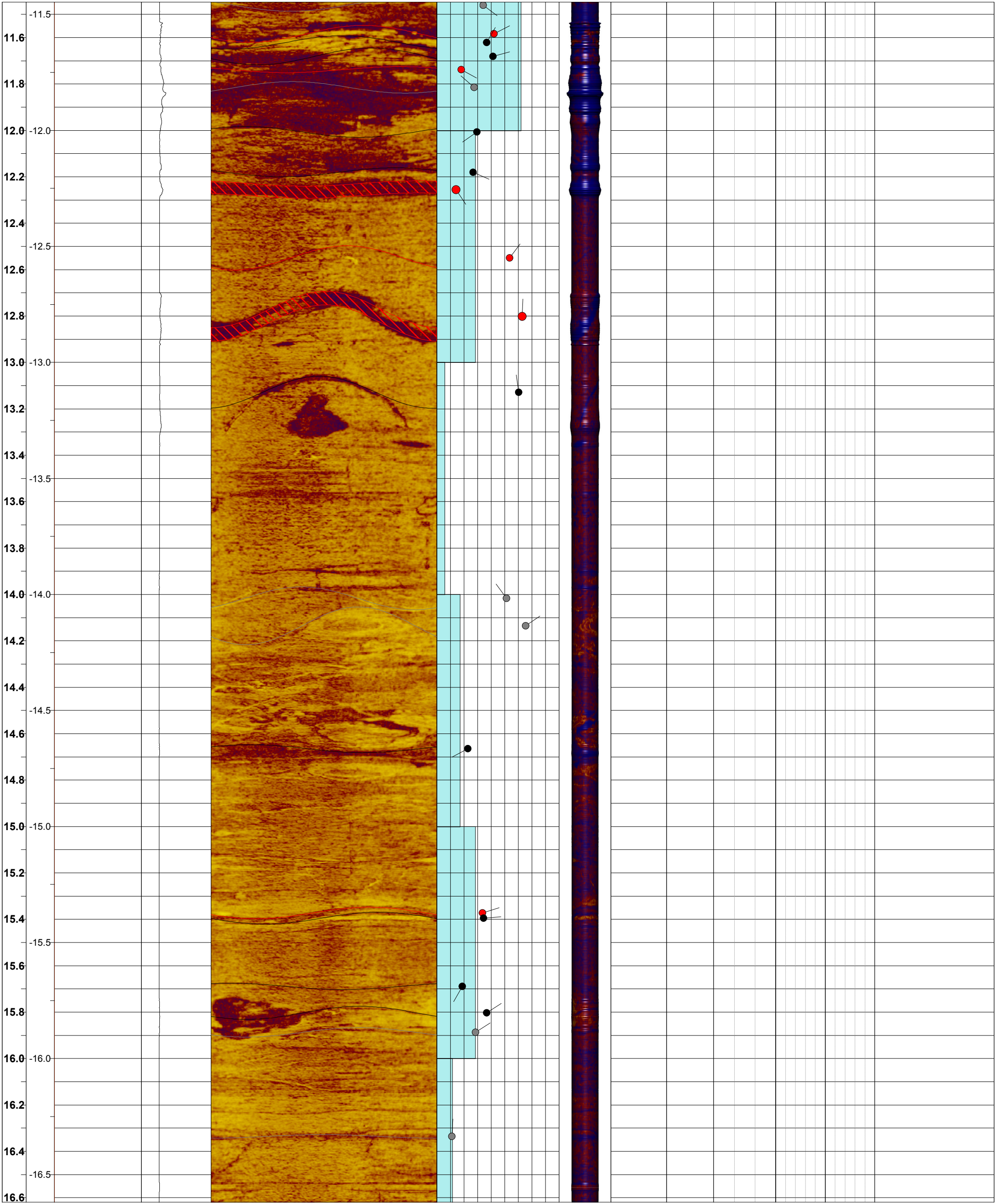
LOCATION-	Vulture St Off Ramp	LOGGED BY-	RCD/MGM
EASTING-	503296.00 m E	LOGGED DATE-	20/8/10
NORTHING-	6959923.00 m N	LOGGING DATUM-	
ELEVATION-		LOGGED DEPTH-	42.70 m
DRILLED DEPTH-	42.70 m	DIAMETER-	
PLUNGE-	-90°	AZIMUTH-	000
CASING-	DEPTH-	DRAWN BY-	RCD
		REVIEWED BY-	TR
		FILE NAME-	CRR208-U.HED.WCL

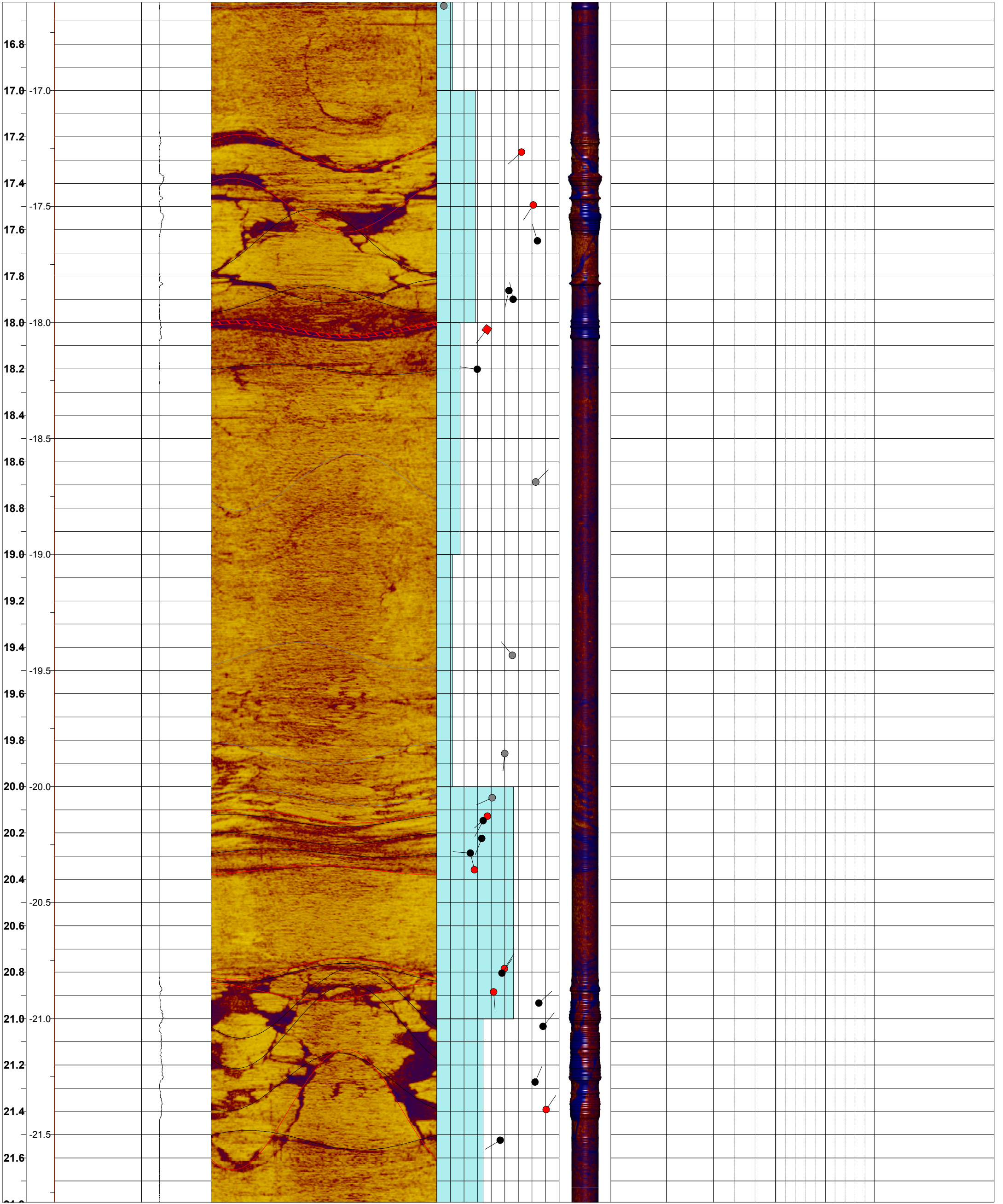
**Lithology**

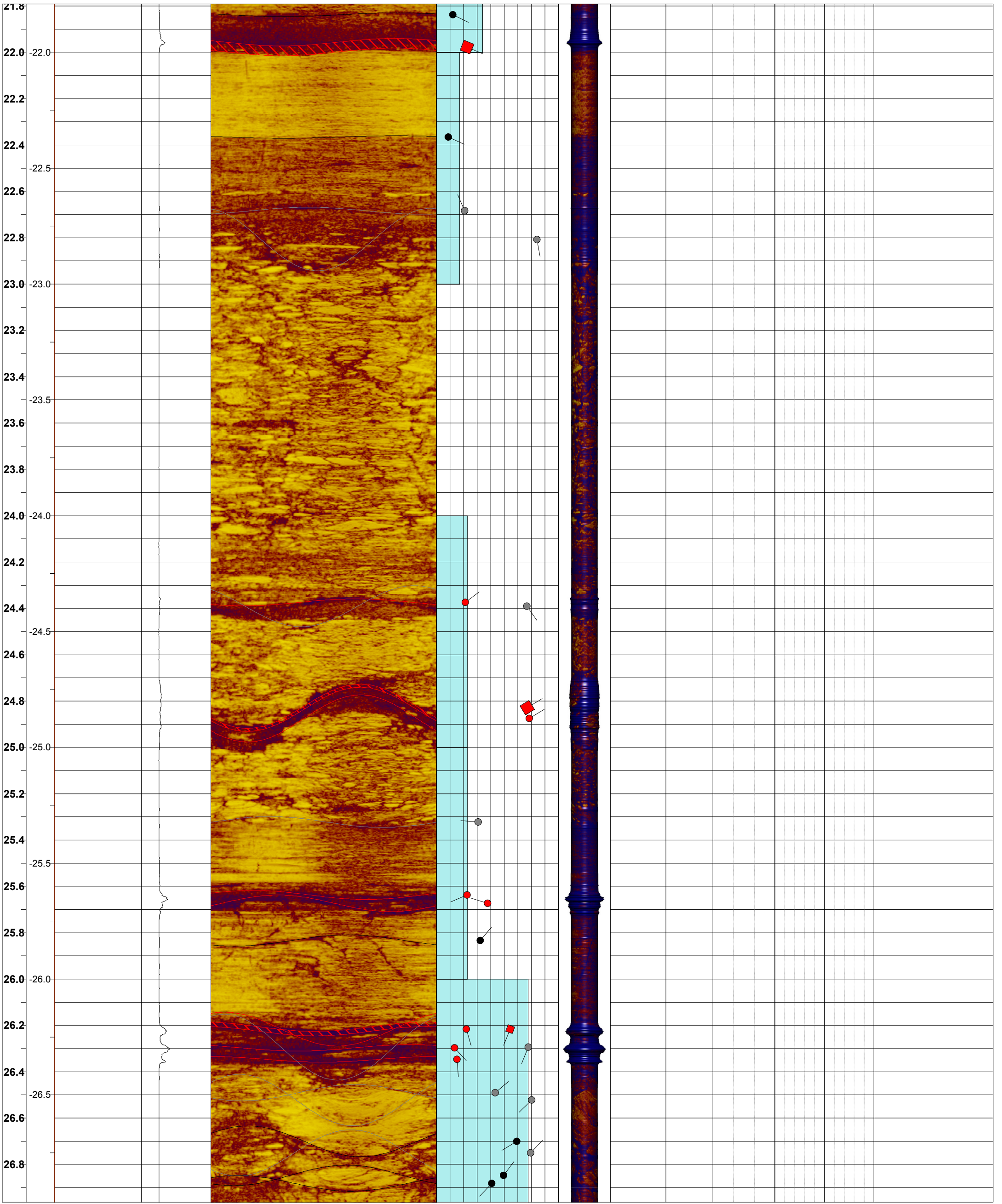
**Interpreted Structures**

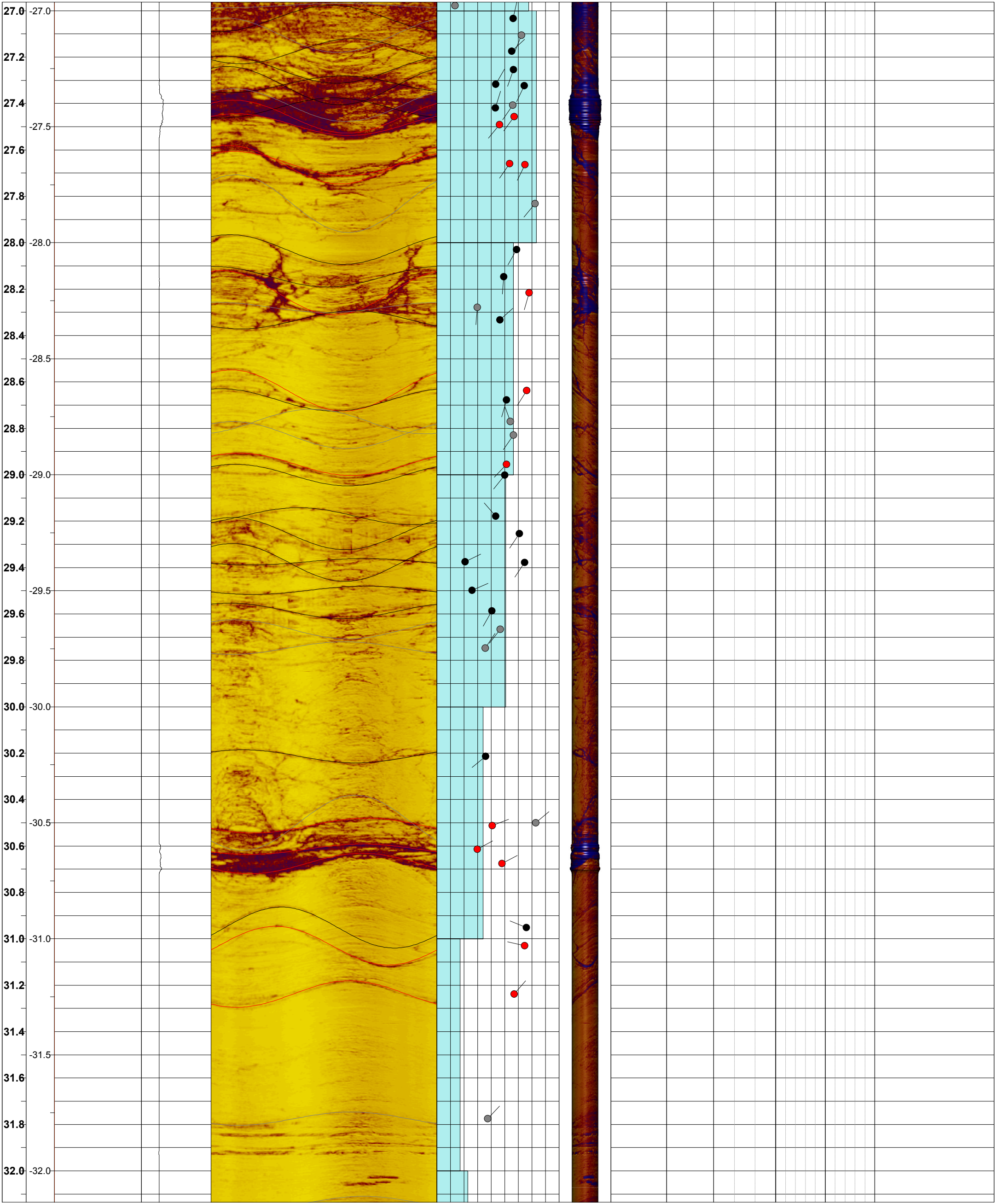
- Joint - Low Confidence
- Joint - High Confidence
- Decomposed Seam - Medium Confidence
- Decomposed Seam - High Confidence
- ◆ Crushed Seam - High Confidence
- ◆ Sheared Seam - High Confidence
- Joint - Medium Confidence

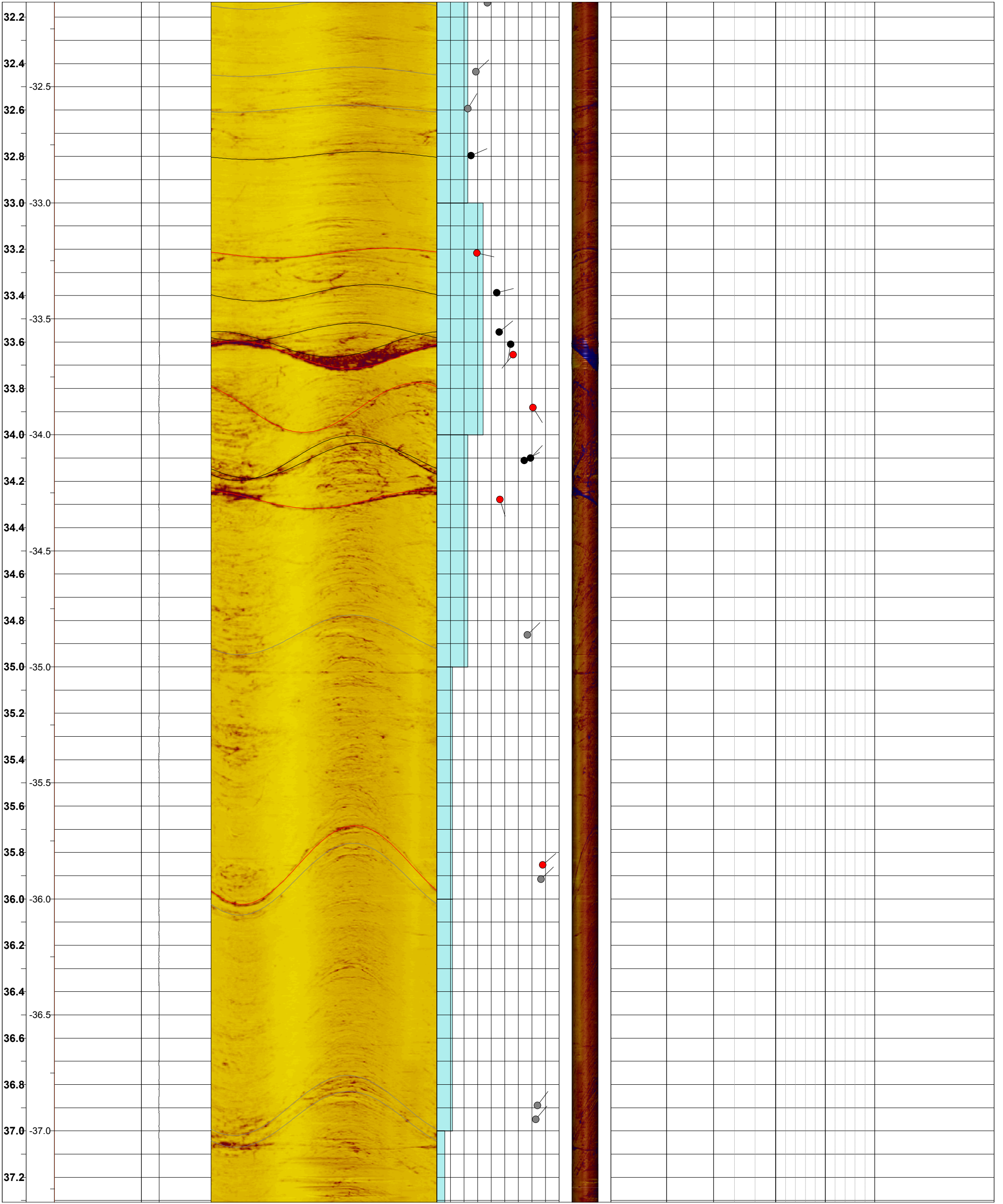




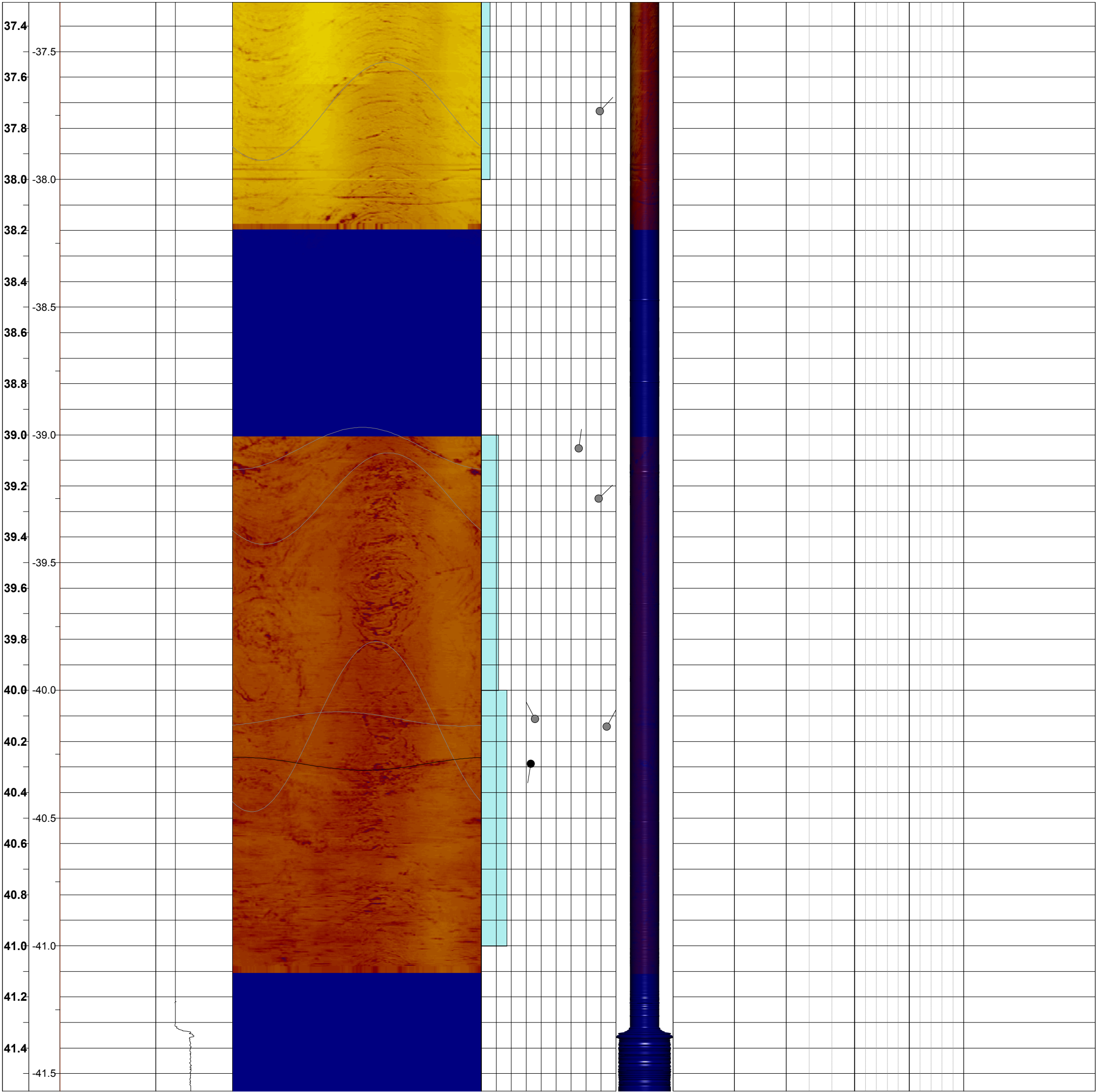




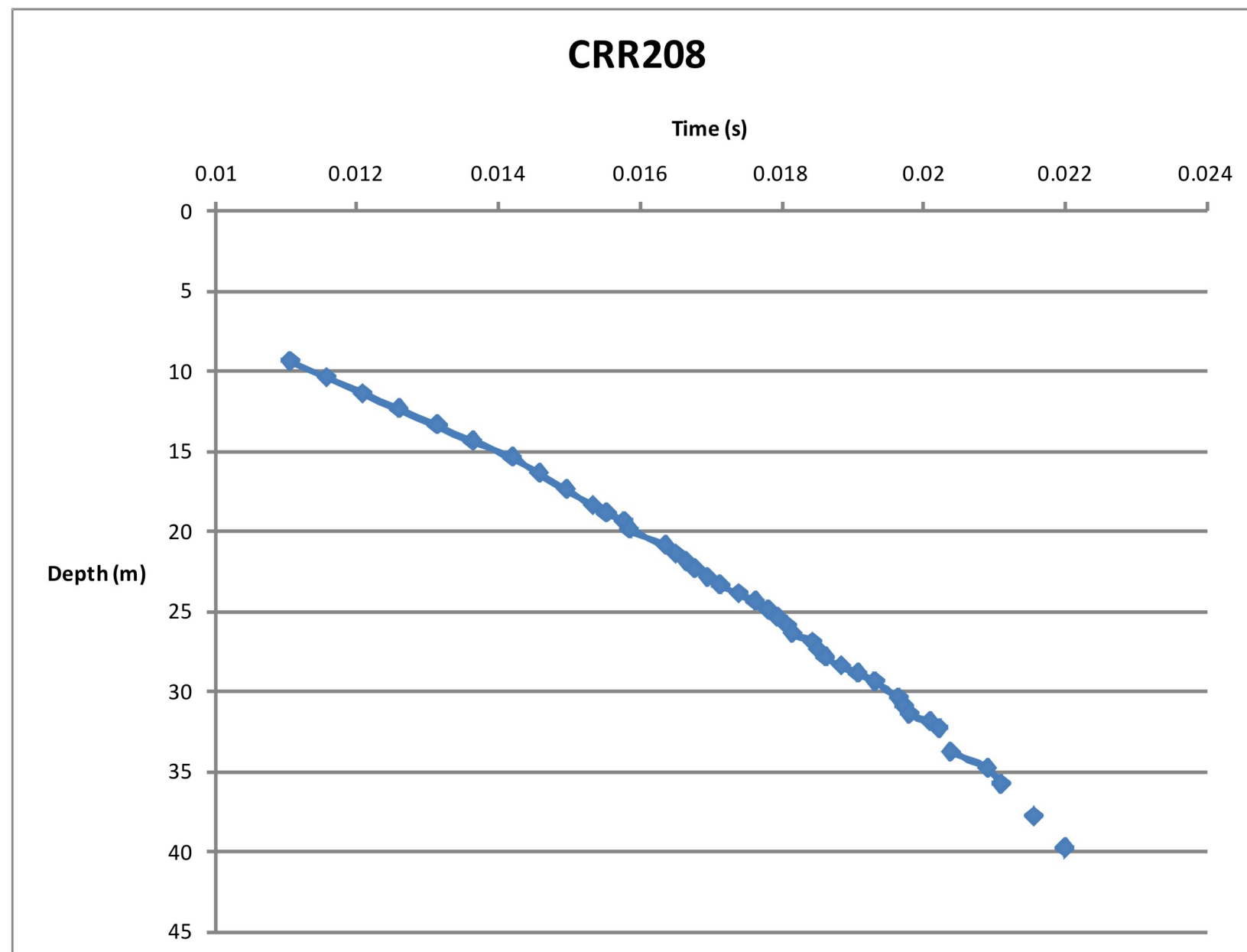








GA-BQ-291 RL1  
 Issued 31/03/10



Geophone Depth (m)		Interval velocity (P wave m/s)
from	to	
9.4	10.4	1946
10.4	11.4	1953
11.4	12.4	1959
12.4	13.4	1846
13.4	14.4	1973
14.4	15.4	1793
15.4	16.4	2638
16.4	17.4	2641
17.4	18.4	2643
18.4	18.9	2645
18.9	19.4	2013
19.4	19.9	6331
19.9	20.9	1987
20.9	21.4	3445
21.4	21.9	3446
21.9	22.4	3960
22.4	22.9	2794
22.9	23.4	2794
23.4	23.9	1905
23.9	24.4	2094
24.4	24.9	2891
24.9	25.4	3622
25.4	25.9	3623
25.9	26.4	7347
26.4	26.9	1746
26.9	27.4	6374
27.4	27.9	4788
27.9	28.4	2203
28.4	28.9	2100
28.9	29.4	2100
29.4	30.4	3084
30.4	30.9	6484
30.9	31.4	6485
31.4	31.9	1679
31.9	32.3	3175
32.3	32.8	*
32.8	33.8	*
33.8	34.8	1906
34.8	35.8	5480
35.8	36.8	*
36.8	37.8	*
37.8	38.8	*
38.8	39.8	*
39.8	40.8	*
40.8	41.8	*

Note:

\* - 1st arrival not clear due to noise

Calculations done without accounting for borehole deviation

	CLIENT <b>Department of Transport and Main Roads</b>		PROJECT <b>Cross River Rail</b>	
	DRAWN <b>GDK</b>	DATE <b>OCT 4</b>	TITLE <b>CRR208 VSP</b>	
	CHECKED <b>TR</b>	DATE		
	SCALE <b>NTS</b>	PROJECT No <b>000-107632034</b>	FIGURE No	REV No <b>A3</b>



# WATER PRESSURE TEST

Revision No : 12.00

Job No. : 107632034	Hole No. : CRR208	Drilling Method : NMLC	Vertical depth to Groundwater	Immediately prior to test (m bgl) :
Client : AECOM	Dip (Deg) : -90	Hole Diameter (m) : 0.0757		Used in analysis (m bgl) :
Project : Cross River Rail	Interval Top (m) : 20.40	Tested Length (m) : 6.00		Pressure Gauge Height (m agl) : 1.70
Location : Vulture St	Interval Base (m) : 26.40	Packer Type : Mechanical - Non-Wireline - Single		Presumed Water Temperature : 25
Tested By : RCD	Computed By : RCD	Rock tested :		Casing Inner Diameter (mm) : 60.300
Date : 23/08/2010	Date : 23/08/2010	Water Meter Reading in Metres	Checked By : NK	Date : 28/10/2010

Pressure Stage	Gauge Pressure kPa	No	Actual Time		Water Meter Readings	Volume (L)	Discharge (L/min)	Discharge/m (L/min/m)	Remarks
			(h:m:s)	(min)					
P1	47	0	0:00:00	0	97.1032	0.00	0.00	0.00	c : 1
		1	0:01:00	01:00	97.1085	5.30	5.30	0.88	
		2	0:02:00	01:00	97.1135	5.00	5.00	0.83	
		3	0:03:00	01:00	97.1283	14.80	14.80	2.47	
		4	0:04:00	01:00	97.1237	-4.60	-4.60	-0.77	
		5	0:05:00	01:00	97.1285	4.80	4.80	0.80	
		6	0:06:00	01:00	97.1332	4.70	4.70	0.78	
		7	0:07:00	01:00	97.1389	5.70	5.70	0.95	
		8	0:08:00	01:00	97.1426	3.70	3.70	0.62	
		9	0:09:00	01:00	97.1472	4.60	4.60	0.77	
						Total :	48.70	8.12	
						Average:	4.870	0.812	
P2	94	0	0:11:00	0	97.1686	0.00	0.00	0.00	c : 1
		1	0:12:00	01:00	97.1769	8.30	8.30	1.38	
		2	0:13:00	01:00	97.1845	7.60	7.60	1.27	
		3	0:14:00	01:00	97.1921	7.60	7.60	1.27	
		4	0:15:00	01:00	97.1995	7.40	7.40	1.23	
		5	0:16:00	01:00	97.2064	6.90	6.90	1.15	
		6	0:17:00	01:00	97.2144	8.00	8.00	1.33	
		7	0:18:00	01:00	97.2215	7.10	7.10	1.18	
		8	0:19:00	01:00	97.2288	7.30	7.30	1.22	
		9	0:20:00	01:00	97.2359	7.10	7.10	1.18	
						Total :	74.40	12.40	
						Average:	7.440	1.240	
P3	142	0	0:22:00	0	97.2552	0.00	0.00	0.00	c : 1
		1	0:23:00	01:00	97.2680	12.80	12.80	2.13	
		2	0:24:00	01:00	97.2804	12.40	12.40	2.07	
		3	0:25:00	01:00	97.2926	12.20	12.20	2.03	
		4	0:26:00	01:00	97.3046	12.00	12.00	2.00	
		5	0:27:00	01:00	97.3162	11.60	11.60	1.93	
		6	0:28:00	01:00	97.3279	11.70	11.70	1.95	
		7	0:29:00	01:00	97.3394	11.50	11.50	1.92	
		8	0:30:00	01:00	97.3511	11.70	11.70	1.95	
		9	0:31:00	01:00	97.3625	11.40	11.40	1.90	
						Total :	118.50	19.75	
						Average:	11.850	1.975	
P4	94	0	0:33:00	0	97.3711	0.00	0.00	0.00	c : 1
		1	0:34:00	01:00	97.3719	0.80	0.80	0.13	
		2	0:35:00	01:00	97.3749	3.00	3.00	0.50	
		3	0:36:00	01:00	97.3787	3.80	3.80	0.63	
		4	0:37:00	01:00	97.3827	4.00	4.00	0.67	
		5	0:38:00	01:00	97.3869	4.20	4.20	0.70	
		6	0:39:00	01:00	97.3913	4.40	4.40	0.73	
		7	0:40:00	01:00	97.3959	4.60	4.60	0.77	
		8	0:41:00	01:00	97.4005	4.60	4.60	0.77	
		9	0:42:00	01:00	97.4052	4.70	4.70	0.78	
						Total :	38.80	6.47	
						Average:	3.880	0.647	
P5	47	1	0:44:00	0	97.4141	0.00	0.00	0.00	c : 1
		2	0:45:00	01:00	97.4187	4.60	4.60	0.77	
		3	0:46:00	01:00	97.4233	4.60	4.60	0.77	
		4	0:47:00	01:00	97.4280	4.70	4.70	0.78	
		5	0:48:00	01:00	97.4325	4.50	4.50	0.75	
		6	0:49:00	01:00	97.4372	4.70	4.70	0.78	
		7	0:50:00	01:00	97.4419	4.70	4.70	0.78	
		8	0:51:00	01:00	97.4466	4.70	4.70	0.78	
		9	0:52:00	01:00	97.4513	4.70	4.70	0.78	
		10	0:53:00	01:00	97.4560	4.70	4.70	0.78	
		11	0:54:00	01:00	97.4606	4.60	4.60	0.77	
						Total :	46.50	7.75	
						Average:	4.650	0.775	

### TEST RESULTS

Stage No.	Houlsby (1976) Value	Lugeon Value Curve	Nett Pressures	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	17.3		63.3		$H_{LOSS} = 2.45 \text{ kPa}$ Stage No. <b>P3</b> Gauge Pressure <b>142 kPa</b> Q <b>11.85 L/min</b> H <b>15.9 m</b> Interpreted Result <b>14 uL</b> Reported k at Stage <b>P3</b>
P2	13.2		109.7		Analytical Method 1: (ref = Golder geotechnical field notes draft 1997) $k = Q/H \times 6.10889 \times 10^{-6} \times (\log(2L/D))/L$ $k = 1.7E-06 \text{ m/s}$ Analytical Method 2: (ref = Sharp, J.C 1975 Pit Slope Manual, CANMET report) $k = 1/(2L \times 3.14) \times (Q/H) \ln(R/r) \text{ m/s}$ (convert L/min to m/s). Assume R = radius of influence of 100m & r = radius of borehole. $k = 2.6E-06 \text{ m/s}$
P3	13.9		156.2		
P4	6.9		110.4		
P5	16.5		63.3		
Flow Type		TURBULENT FLOW	COMMENTS	No Flow	



# WATER PRESSURE TEST

Revision No : 12.00

Job No. : 107632034	Hole No. : CRR208	Drilling Method : NMLC	Vertical depth to Groundwater : 8.01	
Client : AECOM	Dip (Deg) : -90	Hole Diameter (m) : 0.0757	Immediately prior to test (m bgl) : 8.01	
Project : Cross River Rail	Interval Top (m) : 26.50	Tested Length (m) : 6.10	Used in analysis (m bgl) : 8.01	
Location : Vulture St	Interval Base (m) : 32.60	Packer Type : Mechanical - Non-Wireline - Single	Pressure Gauge Height (m agl) : 1.70	
Tested By : RCD	Computed By : RCD	Rock tested :	Presumed Water Temperature : 25	
Date : 23/08/2010	Date : 23/08/2010	Water Meter Reading in Metres	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 (Cubic Metres)	(L)	(L/min)	(L/min/m)	
P1	66	0	0:00:00	0	97.57	0.00	0.00	0.00	c : 1
		1	0:01:00	01:00	97.57	0.00	0.00	0.00	
		2	0:02:00	01:00	97.57	0.10	0.10	0.02	
		3	0:03:00	01:00	97.57	0.10	0.10	0.02	
		4	0:04:00	01:00	97.57	0.00	0.00	0.00	
		5	0:05:00	01:00	97.57	0.00	0.00	0.00	
		6	0:06:00	01:00	97.57	0.10	0.10	0.02	
		7	0:07:00	01:00	97.57	0.10	0.10	0.02	
		8	0:08:00	01:00	97.57	0.00	0.00	0.00	
		9	0:09:00	01:00	97.57	0.10	0.10	0.02	
		10	0:10:00	01:00	97.57	0.00	0.00	0.00	
						Total :	0.50	0.08	
						Average:	0.050	0.008	
P2	131	0	0:11:00	0	97.57	0.00	0.00	0.00	c : 1
		1	0:12:00	01:00	97.57	0.00	0.00	0.00	
		2	0:13:00	01:00	97.57	0.10	0.10	0.02	
		3	0:14:00	01:00	97.57	0.10	0.10	0.02	
		4	0:15:00	01:00	97.57	0.00	0.00	0.00	
		5	0:16:00	01:00	97.57	0.00	0.00	0.00	
		6	0:17:00	01:00	97.57	0.10	0.10	0.02	
		7	0:18:00	01:00	97.57	0.00	0.00	0.00	
		8	0:19:00	01:00	97.57	0.10	0.10	0.02	
		9	0:20:00	01:00	97.57	0.00	0.00	0.00	
		10	0:21:00	01:00	97.57	0.10	0.10	0.02	
						Total :	0.50	0.08	
						Average:	0.050	0.008	
P3	197	0	0:22:00	0	97.57	0.00	0.00	0.00	c : 1
		1	0:23:00	01:00	97.57	0.40	0.40	0.07	
		2	0:24:00	01:00	97.57	0.30	0.30	0.05	
		3	0:25:00	01:00	97.57	0.30	0.30	0.05	
		4	0:26:00	01:00	97.57	0.40	0.40	0.07	
		5	0:27:00	01:00	97.57	0.40	0.40	0.07	
		6	0:28:00	01:00	97.57	0.30	0.30	0.05	
		7	0:29:00	01:00	97.57	0.40	0.40	0.07	
		8	0:30:00	01:00	97.57	0.30	0.30	0.05	
		9	0:31:00	01:00	97.57	0.40	0.40	0.07	
		10	0:32:00	01:00	97.57	0.30	0.30	0.05	
						Total :	3.50	0.57	
						Average:	0.350	0.057	
P4	131	0	0:33:00	0	97.57	0.00	0.00	0.00	c : 1
		1	0:34:00	01:00	97.57	0.10	0.10	0.02	
		2	0:35:00	01:00	97.57	0.10	0.10	0.02	
		3	0:36:00	01:00	97.57	0.00	0.00	0.00	
		4	0:37:00	01:00	97.57	0.10	0.10	0.02	
		5	0:38:00	01:00	97.57	0.10	0.10	0.02	
		6	0:39:00	01:00	97.57	0.10	0.10	0.02	
		7	0:40:00	01:00	97.57	0.10	0.10	0.02	
		8	0:41:00	01:00	97.57	0.10	0.10	0.02	
		9	0:42:00	01:00	97.57	0.10	0.10	0.02	
		10	0:43:00	01:00	97.57	0.10	0.10	0.02	
						Total :	0.90	0.15	
						Average:	0.090	0.015	
P5	66	1	0:44:00	0	97.57	0.00	0.00	0.00	c : 1
		2	0:45:00	01:00	97.57	0.00	0.00	0.00	
		3	0:46:00	01:00	97.57	0.10	0.10	0.02	
		4	0:47:00	01:00	97.57	0.00	0.00	0.00	
		5	0:48:00	01:00	97.57	0.00	0.00	0.00	
		6	0:49:00	01:00	97.57	0.10	0.10	0.02	
		7	0:50:00	01:00	97.57	0.10	0.10	0.02	
		8	0:51:00	01:00	97.57	0.10	0.10	0.02	
		9	0:52:00	01:00	97.57	0.10	0.10	0.02	
		10	0:53:00	01:00	97.57	0.10	0.10	0.02	
		11	0:54:00	01:00	97.57	0.10	0.10	0.02	
								Total :	
						Average:	0.070	0.011	

**TEST RESULTS**

Stage No.	Houlsby (1976) Value	Lugeon Value Curve	Nett Pressures	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	0.1		161.2		$H_{LOSS}$ 0.00 kPa Stage No. <b>Average</b> Gauge Pressure 118 kPa Q 0.12 L/min H 21.8 m Interpreted Result 0 uL Reported k at Stage <b>Average</b> Analytical Method 1: (ref = Golder geotechnical field notes draft 1997) $k = Q/H \times 6.10889 \times 10^{-6} \times (\log(2L/D))/L$ <b>k = 1.2E-08 m/s</b> 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. <b>k = 1.9E-08 m/s</b>
P2	0.1		226.2		
P3	0.3		292.2		
P4	0.1		226.2		
P5	0.2		161.2		
<b>Flow Type</b>		COMMENTS	No Flow		