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**Queensland
Government**

Department of
Main Roads

ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F:GEOT 017/5-2009

BOREHOLE No BH015

SHEET 1 of 3

REFERENCE No H10643

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION

LOCATION Cut 14

COORDINATES 484455.0 E; 7081204.4 N

PROJECT No FG5825 SURFACE R.L. 157.28m PLUNGE DATE STARTED 22/10/09 GRID DATUM MGA94

JOB No 128/10A/901 HEIGHT DATUM AHD BEARING DATE COMPLETED 23/10/09 DRILLER R & D Drilling

DEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD (%)	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
0	157.28												
1				A	Clayey SILT (RESIDUAL) Mottled brown to red, dry, very stiff. Low plasticity. Angular quartz gravels up to 10mm, traces of organics.			(ML)				6,9,9 N=18	SPT
2	155.78			B	PHYLLITE (XW): Generally exhibits the engineering properties of brown, moist, very stiff to hard clayey silt of intermediate plasticity. Angular quartz gravels up to 20mm.			XW				6,11,15 N=26	SPT
3				C	Becoming highly weathered below 2.0m.							24,30/105 N>50	SPT
4	154.28		(0)		PHYLLITE (MW): Pale brown, fine grained, foliated. Foliation is distinct and dips at 45-50°.			MW				Is(50) = 0.18MPa Is(50) = 0.14MPa	x o
5			100		Weathered clayey zones throughout.								
6	153.08		(0)		PHYLLITE (MW - SW): Pale grey with distinct dark grey mottling and interbeds, fine grained, foliated. Foliation is distinct and dips at ~20°.								
7			100		Defects are generally medium spaced with occasional close sets.							Is(50) = 0.13MPa Is(50) = 0.10MPa	x o
8			(8)		Prominent defect set parallel to foliation with other sets at 45 and 70°.								
9			100		Defect surfaces are typically thinly clay infilled and iron stained.								
10			(16)		Occasional zones with thick clay infilling.								
11			100		7.4 - 7.6m: Weaker weathered zone.			MW-SW				Is(50) = 0.42MPa Is(50) = 0.19MPa	x o
12			(19)										
13			100		Detailed defect descriptions are shown on Form GEOT533/8 attached.							Is(50) = 0.24MPa Is(50) = 0.59MPa	x o
14			(11)		9.7 - 10.2m: Weaker weathered zone.								

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached.

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ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F:GEOT 017/5-2009

BOREHOLE No BH015
SHEET 2 of 3
REFERENCE No H10643

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION
LOCATION Cut 14 COORDINATES 484455.0 E; 7081204.4 N
PROJECT No FG5825 SURFACE R.L. 157.28m PLUNGE _____ DATE STARTED 22/10/09 GRID DATUM MGA94
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING _____ DATE COMPLETED 23/10/09 DRILLER R & D Drilling

DEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD () %	CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
10	147.28					PHYLLITE (MW - SW): (Cont'd)									
			100 (30)										Clay seam (75°)		
11			100 (23)										Broken zone		
													Is(50) = 0.21MPa Is(50) = 0.64MPa	x o	
12															
			100 (17)												
13						Detailed defect descriptions are shown on Form GEOT533/8 attached.							Is(50) = 0.56MPa	x	
													Is(50) = 0.81MPa	o	
14			100 (39)												
15								MW-SW					Is(50) = 0.28MPa Is(50) = 0.06MPa	x o	
			100 (9)										Clayey broken zone; minor water loss at 15.6m		
16															
			100 (0)												
17													Is(50) = 0.16MPa Is(50) = 0.11MPa	o x	
			100 (0) 100 (11)			17.2 - 17.5m: Clayey weathered zone.							Quartz vein		
18															
			100 (0) 100 (0)										Clayey broken zone and quartz veins		
19															
													Is(50) = 0.33MPa Is(50) = 0.25MPa	o x	
20			100 (21)												

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached.

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QLD_DMR_LIB_01_GLB_Log_A_ENGINEERING_BOREHOLE_LOG_W_LITHOLOGY_FG5825_BRUCE_HWY_COOROY-CURRA_SECTION_A_BHS.GPJ DWG595012.GDW Datalog CPT Tool gINT Add-in 12/05/2010 10:29



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ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F:GEOT 017/5-2009

BOREHOLE No BH015

SHEET 3 of 3

REFERENCE No H10643

PROJECT BRUCE HIGHWAY (COOROY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION

LOCATION Cut 14 COORDINATES 484455.0 E; 7081204.4 N

PROJECT No FG5825 SURFACE R.L. 157.28m PLUNGE _____ DATE STARTED 22/10/09 GRID DATUM MGA94

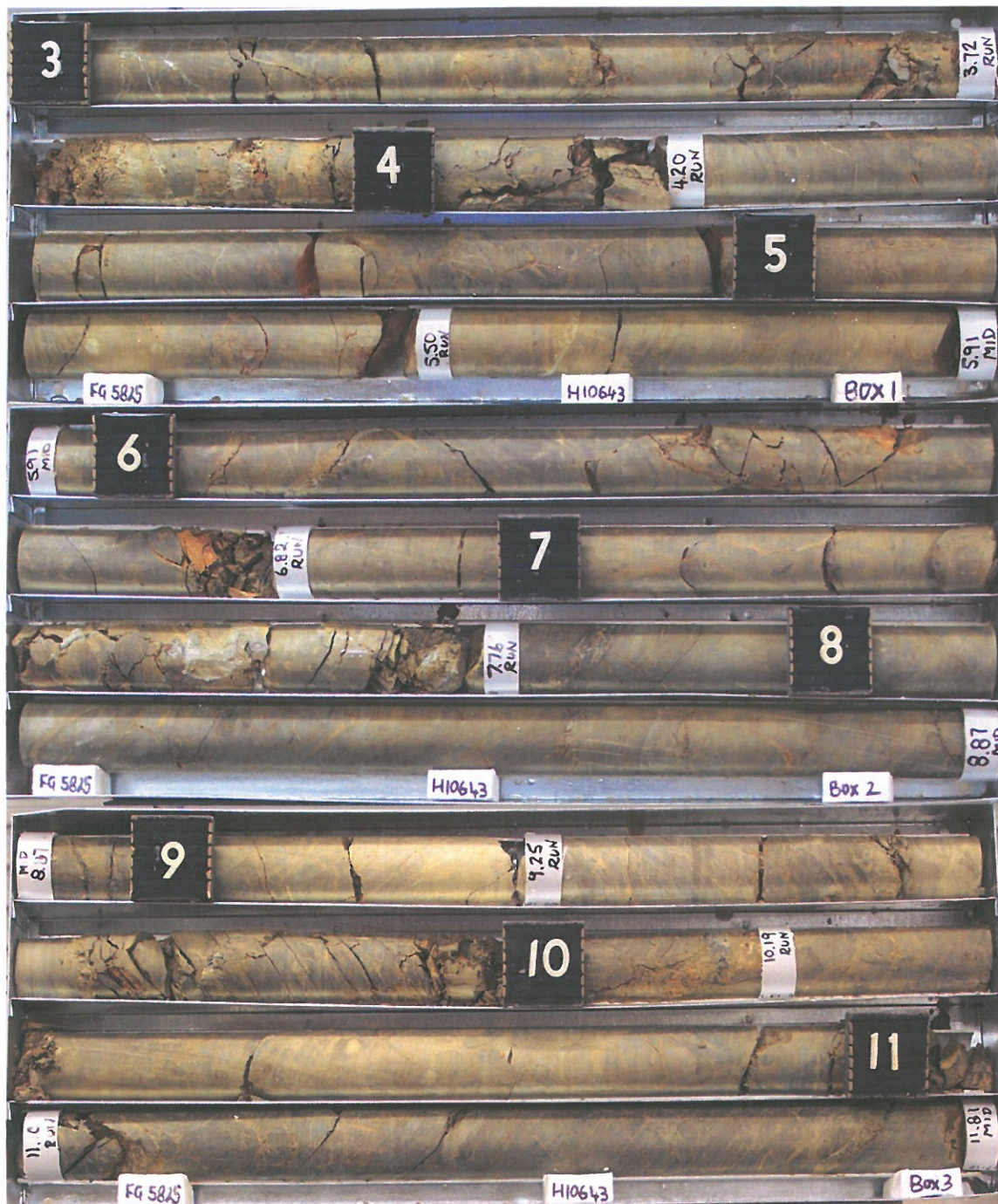
JOB No 128/10A/901 HEIGHT DATUM AHD BEARING _____ DATE COMPLETED 23/10/09 DRILLER R & D Drilling

DEPTH (m)	R.L. (m)	AUGER CASING WASH BORING CORE DRILLING	RQD (%)	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
20	137.28											
21			100 (25)		PHYLLITE (MW - SW): (Cont'd)							
22					Detailed defect descriptions are shown on Form GEOT533/8 attached.		MW-SW				Is(50) = 0.31MPa Is(50) = 0.29MPa	x o
23	133.98		100 (16)		23.2 - 23.4m: Brecciated contact zone.					Broken zone Clayey weathered zone		
24			100 (39)		ANDESITE (MW): Pale orange-brown, fine grained, heavily altered, massive. Defects are generally medium spaced. Defect sets at 10 and 45°.		MW				Is(50) = 1.59MPa Is(50) = 3.32MPa	x o
25					Defect surfaces are typically iron stained or thinly clay infilled.						Is(50) = 2.40MPa Is(50) = 4.54MPa	x o
26	131.48		100		25.1 - 25.8m: Becoming dark grey SW rock.						Is(50) = 0.13MPa Is(50) = 0.12MPa Is(50) = 0.06MPa Is(50) = 0.04MPa	o x x o
27					Borehole terminated at 25.8m							
28												
29												
30												

REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached.

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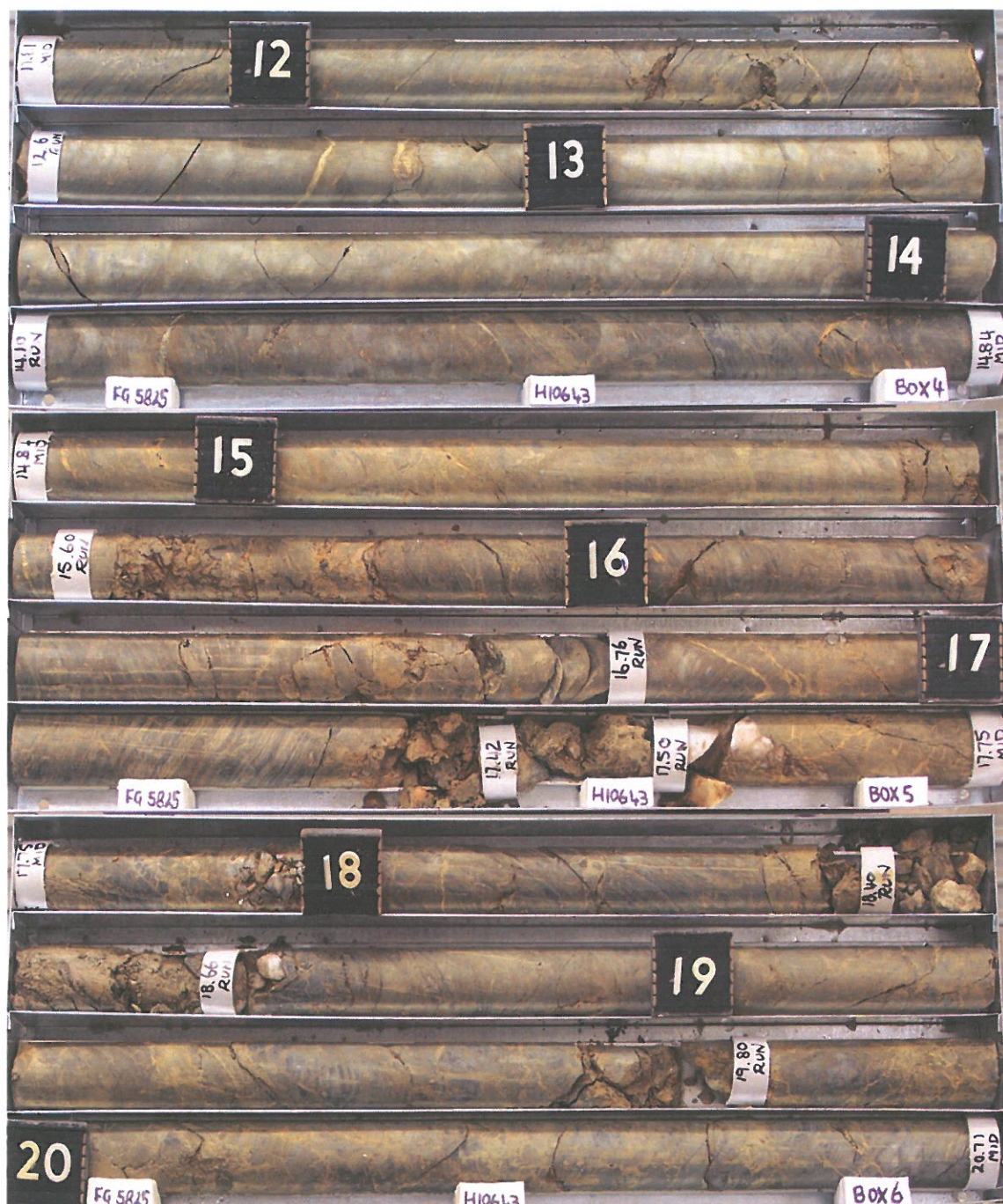
Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**
 Borehole No: **BH15**
 Start Depth: 3.00m
 Finish Depth: 25.80m
 Project No: FG5825
 H No: 10643



SCALE 1:5

F:GEOT043/1

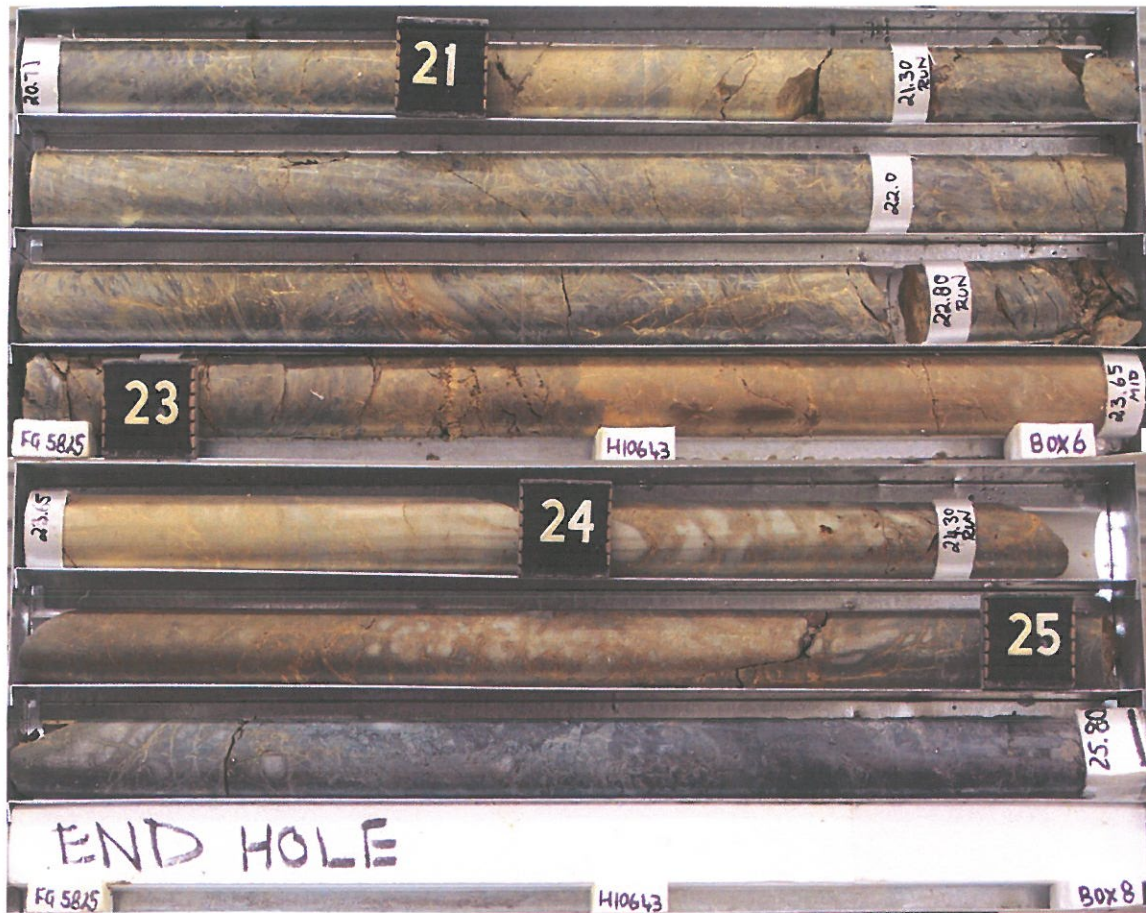
Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**
 Borehole No: **BH15**
 Start Depth: 3.00m
 Finish Depth: 25.80m
 Project No: FG5825
 H No: 10643



SCALE 1:5

F:GEOT043/1

Project: **Bruce Highway Upgrade (Cooroy – Curra) Section A**
Borehole No: **BH15**
Start Depth: 3.00m
Finish Depth: 25.80m
Project No: FG5825
H No: 10643



SCALE 1:5

F:GEOT043/1

GEOTECHNICAL BRANCH LABORATORY

Materials Services - Brisbane
35 Butterfield Street, HERSTON Q 4006
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**DEFECT DESCRIPTIONS
OF ENGINEERING BORELOGS**
[CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH
ISRM SUGGESTED METHODS (1981)]

BOREHOLE NO.:	BH15
SHEET:	1 of 4
REFERENCE NO.:	H10643

PROJECT:	Bruce Highway (Cooroy – Curra) Section A Geotechnical Investigation					
LOCATION:	Cut 14					
PROJECT NO.:	FG5825	SURFACE R.L.:	157.3	DRILLER:	R & D Drilling	
JOB NO.:	128/10A/901	DATUM:	MGA94	DATE DRILLED:	22/10/09	

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
3.09	Clay Seam	10	Pl		C		Not Pervasive 70mm Wide
3.20	J	80	Un	S	O	FeSt	
3.29	J	30	Pl	SR	O	FeSt	Clay Veneer
3.32	J	40	St	S	C	FeSt	
3.38	J	50	Un	S	C	FeSt	
3.45	J	45	Un	S	O	FeSt	Cl, 1-2mm
3.60	J	55	Pl	SR	O	FeSt	
3.68	Clay Seam	30	Pl	S	O	FeSt	10mm Wide, Crushed Rock in Defect
3.69-3.95	WS						
3.95-4.20	BZ						
4.49	J	20	Pl	R	O	FeSt	Partly Rehealed
4.67	J	60	Un	SR	C	FeSt	
4.72	J	35	Pl	S	C	FeSt	
5.02	J	40	Un	S	C	FeSt	Clay Veneer
5.24	J	45	Pl	S	C	FeSt	Clay Veneer
5.37	J	40	Pl		C		
5.47	J	30	Pl	S	C	FeSt	
5.54	J	35	St	S	C	FeSt	

Abbreviations

ROUGHNESS		WALL ALTERATIONS		TYPE		OTHER	
R	Rough	FeSt	Iron Stained	J	Joint	P	Partly
S	Smooth	W	Weathered	B	Bedding	QZ	Quartz Vein
SL	Slickensided			BP	Bedding Parting	Co	Coal Seam
				FP	Foliation Parting	In	Incipient
PLANARITY		APERTURE		SZ	Sheared Zone	SI	Sand Infill
Pl	Planar	C	Closed	WS	Weathered Seam	H	Horizontal
St	Stepped	O	Open	CZ	Crushed Zone	V	Vertical
Un	Undulating	F	Filled	SM	Secondary Mineralisation	CI	Clay Infill
Cu	Curved	T	Tight	BZ	Broken Zone	Cn	Clean
Ir	Irregular			HFZ	Highly Fractured Zone	Mn	Manganese
				Fr	Fracture		

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.

BOREHOLE NO.:	BH15
SHEET:	2 of 4
REFERENCE NO.:	H10643

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
5.54	J	35	St	S	C	FeSt	
6.03	J	30	Pl	S	C	FeSt	Clay veneer
6.07	Fr	45	Ir		C		
6.16	J	50	Pl		C		Cl, 5mm
6.27	J	45	St	S	C	FeSt	
6.38	J	50	Pl	S	C	FeSt,MnSt	
6.47	J	30	Pl	S	C	FeSt	
6.54	J	25	Pl	S	C	FeSt	
6.58	J	70	Pl	SR	C	FeSt	Clay Veneer
6.73	J	65	Un	S	C	FeSt	
6.76-6.80	WS						
6.86	Rehealed, J	5	Pl		C		
6.94	J	5	Pl	S	C	MnSt,FeSt	
7.13	J	45	Un		C		
7.19	J	15	Un	S	O		Cn
7.22	J	40	Un	S	O	MnSt,FeSt	
7.31	J	40	Pl	S	C	FeSt	
7.40-7.59	WS						
7.67	J	65	Un	S	C	FeSt	
7.67-7.76	WS						
7.98	J	40	St		C		
8.32	Rehealed, J	45	Pl		C		
8.67	Rehealed, J	50	Un		C		
8.76-8.77	Closely Spaced Micro Fractures						
8.85	J	40	Pl		C		
8.93	J	5					
8.95	J	5					
9.02	J	25					
9.08	Rehealed, J	10	Un		C		
9.14	J	10	Un	S	C	FeSt,MnSt	
9.27	J	60	Un		C		
9.56	J	40	Pl		C		Crushed Rock in Defect
9.66-10.00	FP x 10	35	Pl		C	0.5-2.0cm Spacing	
10.08-10.19	WS	65					20-30mm Wide
10.41	J	20	Pl	SR	O		Crushed Rock & Clay in Defect 5mm
10.59	J	40	Pl	S	C	FeSt,MnSt	
10.95	J	30	Ir	SR	O	FeSt,MnSt	
11.05-11.10	BZ						
11.16	J	45	St	R	O	FeSt	
11.31	FP	45	Pl	S	C	FeSt,MnSt	
11.37	FP	45	Pl	S	C	FeSt,MnSt	
11.41	FP	45	Pl	S	C	FeSt,MnSt	
11.73	WS	50	Pl		C		10mm Wide
11.93	J	55-60	Un		C		
12.11	J	50	Pl		C		
12.20	Fr	15			C		
12.26	Fr	40			C		
12.31	J	40	Pl	SR	O	FeSt	
12.37	J	35-75	Un		C		
12.46	J	25	Pl	S	O	FeSt,MnSt	
12.71	J	35	Pl	SR	C	FeSt,MnSt	
12.82	QZ	25	Pl		C		Weathered, 2-5 mm Wide
12.88	J	35	Pl	S	O	FeSt,MnSt	
12.97	J	45	Pl	SR	O	FeSt	
13.29	J	65	Un	R	O	FeSt,MnSt	

BOREHOLE NO.:	BH15
SHEET:	3 of 4
REFERENCE NO.:	H10643

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
13.38	J	35	Un	R	O	FeSt,MnSt	
13.44	J	45	Pl	S	C	FeSt,MnSt	
13.54	J	45	St	R	O	FeSt,MnSt	
13.58	J	55	Pl	SR	C	FeSt,MnSt	
13.84	J	40	Pl	SR	C	FeSt	
14.21	WS	30	Pl		C		
14.44	J	45	Un		C		
14.60	J	30	Un	S	O		Cl, 1mm
14.71	J	60	Un	R	O	FeSt,MnSt	
14.75	J	30	Un	SR	O		Cn
14.97	J	80	Un	R	O	FeSt,MnSt	
15.15	J	20	Pl	R	O	W	
15.19	WS	50	Un		C		2mm Wide
15.36	J	35	Pl		C		
15.52-15.56	WS						
15.63-15.67	CZ						
15.73	Fr	10	Un		C		
15.84	J	40	Pl		C	Cl, 3mm	
15.91	J	30-45	Un		C		
15.95	J	35	Un		C		
16.01	J	60	Pl	R	C	FeSt	
16.08	J	45	St	SR	C	FeSt,MnSt	
16.15	J	70	Un	R	C	FeSt	Clay Veneer
16.25	J	35	Pl	SR	C	FeSt	
16.44	J	30	Un	S	C		Cn
16.54	J	50	Un	S	C	FeSt,MnSt	
16.65	J	55	Un	S	C	W	
16.70-16.75	FP x 3	45	Pl	S	C	FeSt	
16.83	Clay seam	60	Un		C		Weathered ,2-5mm
16.95	WS	45			C		3mm Wide
17.15	J	40	Un	S	C	FeSt	
17.24	J	25	Un	S	C	FeSt,MnSt	
17.30-17.50	WS						
17.50-17.56	QZ						Discontinuous 10-30mm Wide
17.62	J	45	Un		C		
17.68	J	70	Un		C		
17.75-17.82	Zone of Closely Spaced Fractures						
17.92-18.00	WS						
18.10	J	40	Un	SR	C	FeSt	
18.16	J	45	Pl		C		
18.20	J	30	Pl		C		
18.32	J	30	Pl	R	C	FeSt	
18.40-18.50	QZ Gravel						
18.50-18.68	WS						
18.88	J	40	Pl	S	C	FeSt	
18.94	J	35	Un	S	C	FeSt	
19.14	J	70	Pl	S	C	FeSt	
19.22	J	70	Un	S	C	FeSt	
19.38	J	25	Pl	S	C		Cn
19.45	J	30	Pl	SR	C	FeSt	
19.54	J	75	Un	S	C	FeSt	
19.57	J	65	St	R	C	FeSt	
19.67	J	70	Un	S	C	FeSt	
19.89-20.00	Zone of Closely Spaced Micro Fractures						
20.03	J	65	Pl		C		Cl, 1mm
20.10	J	50	Pl		C	FeSt	

BOREHOLE NO.:	BH15
SHEET:	4 of 4
REFERENCE NO.:	H10643

DEPTH	DEFECT TYPE	DIP°	PLANARITY	ROUGHNESS	APERTURE	WALL ALTERATION	OTHER
20.28	J	60	Un	S	C	FeSt,MnSt	
20.38	Fr	30	Un		C		
20.50	J	15	Un		C		
20.61	J	5-10	Un		C		
20.85	Fr	5	St		C		
20.89	Fr	5	St		C		
21.03	J	35	Pl		C		
21.18	J	35	Pl	SR	C	FeSt	
21.23	J	10-20	Ir	S	O	FeSt	
21.76	J	65	Un		C		
21.83	J	35	Un		C		
21.86	J	20	Pl		C		
21.97	J	50	Un		C		
22.37	J	20	Un		C		
22.44	J	35	Un		C		
22.47	QZ	40	Pl				
22.57	J	10	Pl	SR	C	FeSt,MnSt	
22.69	J	40	Un	S	C	FeSt,MnSt	
22.79	J	35	Un	S	C	FeSt,MnSt	
22.86-23.00	BZ	Defects Typically 35-45	Pl		C	W	
23.06	J	20	Pl	SR	C	FeSt,MnSt	
23.10	J	40	Pl	SR	C	FeSt	Clay Veneer
23.16	J	50	Pl	S	C	FeSt	Cl, 1mm
23.22-23.29	WS						
23.45	J	35	Pl	SR	C	W	
24.00	J	50	St	R	C	MnSt,FeSt	
24.08	J	70	St	R	C	MnSt,FeSt	
24.12	Rehealed, J	55	Un		C		
24.38	J	50	Pl	R	C	FeSt,MnSt	
24.50	J	50	Pl	R	C	FeSt,MnSt	
24.58	J	70	Un	R	C	FeSt,MnSt	
24.85	Rehealed,J	85	Pl	R	C	FeSt,MnSt	
25.21	J	20	Pl	S	O	FeSt	Cl, 2mm
25.30	J	25	Un	S	C		Cn