E

Appendix E Non-Cored and Cored Borehole Logs and Photographs

URS Non-cored Hole

BOREHOLE BH-01

URS Australia Pty Ltd
Lvl 4, 407 Pacific Highway, Artarmon, NSW
Phone: +61.2.8925 5500
Fax: +61.2.8925 5555

Drilling Contractor: **Strategic Drilling Services**

Project Reference: **Paling Yards Wind Farm**

Project No.: **43167888**

Client: **Union Fenosa Wind Australia**

Location: **Paling Yards, NSW**

Logged By: **T Huang**
Checked By: **D Tulasi**
Date Started: **18-7-11**
Date Finished: **20-7-11**

Bore Size: **150 mm**
Total Depth: **1.40 m**
Casing Size: **mm**

Relative Level: **870.00 mRL**
Coordinates: **6215202.86 mN**
750045.99 mE
Permit No:

Drill Type: **SFA Auger "TC" Bit**
Drill Model: **CME 55LC track mounted drilling rig**
Drill Fluid: **N/A**

SAMPLE TYPE	RUN (m)	FIELD SHEAR STRENGTH (kPa)	PENETROMETER BLOWS (N)	SAMPLING AND OTHER TESTING	GROUND WATER DATA AND COMMENTS	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA	MOISTURE CONDITION	USCS	CONSISTENCY/ DENSITY	GEOLOGICAL DESCRIPTION
						0		Clayey SAND, fine grained, dark brown, with some crushed siltstone and gravel, grass covered, overburden Topsoil	M/W	-	-	Topsoil
						1		SILTSTONE, low to medium strength, distinctly weathered, pale brown to orange	-	-	-	Bedrock
								TC Bit Refusal, End of Non-Cored Log at 1.4m, Continues as Cored Log				

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URS Cored Borehole

BOREHOLE BH-01

URS Australia PTY LTD
Lv4, 407 Pacific Hwy, Artarmon NSW 2064
Phone: +61 2 8925 5500
Fax: +61 2 8925 5555

Drilling Contractor: **Strategic Drilling Services**

Project Reference: **Paling Yards Wind Farm**

Project No.: **43167888**

Client: **Union Fenosa Wind Australia**

Location: **Paling Yards, NSW**

Logged By: **T Huang**
Checked By: **D Tulasi**
Date Started: **18-7-11**
Date Finished: **20-7-11**

Bore Size: **100 mm**
Casing Size: **mm**
Total Depth: **20.00 m**
Borehole Inclination and Bearing: **90° from horizontal at ° True North**

Relative Level: **870.00 mRL**
Coordinates: **6215202.86 mN 750045.99 mE**
Permit No:

Drill Type: **NMLC - Diamond Impreg. Bit**
Drill Model: **CME 55LC track mounted drilling rig**
Drill Fluid: **N/A**

DRILLING					MATERIAL DESCRIPTION				DISCONTINUITY DESCRIPTION		
METHOD	WATER	RUN/RECOVERY	FIELD TESTS/ SAMPLING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA (Rock type, strength, Weathering, color, fabric, grain size, inclusions, degree of fracturing)	WEATHERING	STRENGTH Is (50) MPa EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH	RQD (%)	DEFECT SPACING (mm) 0-19 20-49 50-99 100-199 200-599 >600	DEFECT LOG	DEFECT DESCRIPTION (Defect type, inclination, shape, roughness, infill, thickness)
NMLC - DIAMOND IMPREGNATED BIT				0								
				1		Continues from Non-Cored Log at 1.4m			1.4			
						SANDSTONE, medium to high strength, distinctly weathered, pale grey and pale brown, fine to coarse grained sand, with a trace of medium to gravel size quartz, with a trace of clay infilling along joints, slight fractured	DW		58			JN, 80*, Pl, SR, Qz JN, 45*, Pl, SR, Qz DZ, 20*, 1.72 to 1.77m JN, 60*, Pl-Ir, SR, Qz
				2					2			Hand Break Organic Roots JN, 45*, Pl, SR, along with CS, 2mm thick JN, 45*, Pl, SR JN, 45*, Pl, SR JN, 60*, Pl, SR, along with CS, 8mm thick JN, 60*, Pl, S, Qz JN, 60*, Pl, SR, Qz
						SILTSTONE, medium to high strength, extremely weathered to distinctly weathered, pale brown to orange, with some fine to coarse grained sand, with some medium to gravel size quartz, with some clay infilling along joints, slightly fractured With iron staining, 2.63 to 2.72m			35			Drilling Induced Break JN, 70*, Pl, S, Fe JN, 60*, Pl, S, Fe JN, 70*, Pl, SR, Fe JN, 60*, Pl, SR, Qz
				3					3			JN, 65*, Pl, S, Qz
							XW					Drilling Induced Break DZ, 0*, 3.21 to 3.23m JN, 60*, Pl, SR DZ, 0*, 3.27 to 3.35m, with CS JN, 60*, Ir, SR JN, 70*, Pl, SR
						Colour changes to pale grey, mottled pale brown and orange	DW		16			
							XW					DZ, 60*, 3.54 to 3.8m
				4					4			JN, 70*, Pl, SR JN, 70*, Pl, SR Hand Break DZ, 70*, 4 to 4.23m
						SILTSTONE, high strength, slightly weathered, pale brown and pale grey, with some fine to coarse grained sand, with some interbeded sandstone band and medium to gravel size quartz, with some clay infilling along joints, slightly fractured	SW		66			
												Hand Break JN, 60*, Pl, SR, Qz
				5					5			

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URS Cored Borehole

BOREHOLE BH-01

URS Australia PTY LTD
Lv4, 407 Pacific Hwy, Artarmon NSW 2064
Phone: +61 2 8925 5500
Fax: +61 2 8925 5555

Project No.: **43167888**

Project Reference: **Paling Yards Wind Farm**

DRILLING					MATERIAL DESCRIPTION				DISCONTINUITY DESCRIPTION		
METHOD	WATER	RUN/RECOVERY	FIELD TESTS/ SAMPLING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA (Rock type, strength, Weathering, color, fabric, grain size, inclusions, degree of fracturing)	WEATHERING	STRENGTH Is (50) MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	RQD (%)	DEFECT SPACING (mm) (0-19, 20-49, 50-99, 100-199, 200-599, >600)	DEFECT LOG	DEFECT DESCRIPTION (Defect type, inclination, shape, roughness, infill, thickness)
NMLC - DIAMOND IMPREGNATED BIT				5		Core Loss 5 to 5.39m						
			D=0.39 A=0.77	6		SILTSTONE, medium to high strength, distinctly to slightly weathered, pale brown and pale grey, with some fine to coarse grained sand, with some interbeded sandstone band and medium to gravel size quartz, with some clay infilling along joints, with a trace of iron staining, slightly fractured to fractured	DW SW		36 6 71			DZ, 60*, 5.39 to 5.48m JN, 60*, Ir, R Hand Break
				7			DW		7 25			JN, 45*, Ir, R, Fe JN, 70*, Pl, SR, Fe JN, 60*, Pl, SR, Fe JN, 60*, Pl, SR DZ, 0*, 7.52 to 7.65m
						Core Loss 7.65 to 7.76m						Drilling Induced Fractures, 7.65 to 7.85m
				8		SILTSTONE; as above Quartz Band, 0*, 5mm thick			8 71			Hand Break JN, 45*, Pl, SR, Fe, Qz JN, 70*, Pl, SR, Fe JN, 50-60*, Ir, R, Fe
			D=0.58 A=N/A	9			SW		9 38			JN, 45*, Pl, SR, Fe JN, 45*, Ir, R, Fe JN, 60*, Ir, R, Fe JN, 50*, Ir, SR, Fe JN, 70*, Pl-Ir, R, Fe
				10		SILTSTONE, high strength, distinctly to slightly weathered, pale brown and pale grey, with some fine to coarse grained sand, with some interbeded sandstone band and medium to gravel size quartz and quartz band, with some clay infilling along joints, with some iron staining, slightly fractured to fractured Quartz Band, 0*, 2 to 4mm thick	XW DW SW		10 35 10.6 72			CS, 45*, 80mm thick JN, 45*, Pl, R, Fe Drilling Induced Break Hand Break DZ, 10-45*, 10.44 to 10.53m Drilling Induced Break JN, 45*, Pl-Ir, R, Fe, Qz
						Core Loss 10.9 to 11m	DW		11			

Remarks: Point Load Strength (Is50) results for diametral and axial test are displayed as D and A respectively

URS Cored Borehole

BOREHOLE BH-01

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Fax: +61 2 8925 5555

Project No.: **43167888**

Project Reference: **Paling Yards Wind Farm**

DRILLING					MATERIAL DESCRIPTION				DISCONTINUITY DESCRIPTION		
METHOD	WATER	RUN/RECOVERY	FIELD TESTS/ SAMPLING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA (Rock type, strength, Weathering, color, fabric, grain size, inclusions, degree of fracturing)	WEATHERING	STRENGTH Is (50) MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	RQD (%)	DEFECT SPACING (mm) (0-19, 20-49, 50-99, 100-199, 200-599, >600)	DEFECT LOG	DEFECT DESCRIPTION (Defect type, inclination, shape, roughness, infill, thickness)
NMLC - DIAMOND IMPREGNATED BIT				11		SILTSTONE; as above	SW					
						Quartz Band, 60*, 4 to 5mm thick						
						Quartz Band, 70*, 2 to 6mm thick						
						Quartz Band, 70*, 2 to 6mm thick			92			
				12					12			Hand Break
												JN, 45*, Pl, SR, Fe
									93			
												JN, 60*, Pl-Ir, SR, Fe
			D=1.68 A=1.46									Drilling Induced Break
				13					13			Hand Break
						Quartz Band, 55*, 4 to 6mm thick						
						Quartz Band, 70*, 2 to 5mm thick			71			
							DW					JN, 45*, Pl-Ir, R, Fe, Qz
						Quartz Band, 70-80*, 2 to 15mm thick	SW		14			Drilling Induced Break
				14								Hand Break
												Drilling Induced Break
						Quartz Band, 70*, 2 to 3mm thick						
						Quartz Band, 50*, 2 to 4mm thick			67			DZ, 45*, 14.47 to 14.6m, along with CS
							DW					JN, 60*, Pl-Ir, R, Qz
												Drilling Induced Break
							SW					JN, 45*, Pl-Ir, R, Fe, Qz
				15					15			JN, 60*, Pl, SR, Fe, Qz
						SILTSTONE, high strength, distinctly to slightly weathered, pale brown and pale grey, with some fine to coarse grained sand, with some interbeded sandstone band and medium to gravel size quartz and quartz band, with some clay infilling along joints, with some iron staining, factured						Hand Break
												Drilling Induced Break
												JN, 70*, Pl, SR, Fe
									34			
						Quartz Band, 70*, 3 to 6mm thick						JN, 60*, Pl-Ir, R, Fe, Qz
			D=0.41 A=0.88			Quartz Band, 70*, 3 to 8mm thick						
						Quartz Band, 70*, 3 to 12mm thick						DZ, 60*, 15.74 to 15.87m
							DW					JN, 60*, Pl, SR, Fe
				16					16			Hand Break
						Quartz Band, 70*, 5 to 20mm thick						
												Drilling Induced Break
												DZ, 10*, 16.28 to 16.44m
									42			
						Quartz Band, 70*, 2 to 5mm thick						JN, 45*, Pl, SR, Fe
						Quartz Band, 60*, 5 to 6mm thick			17			

URS Cored Borehole

BOREHOLE BH-01

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Fax: +61 2 8925 5555

Project No.: **43167888**

Project Reference: **Paling Yards Wind Farm**

DRILLING					MATERIAL DESCRIPTION				DISCONTINUITY DESCRIPTION		
METHOD	WATER	RUN/RECOVERY	FIELD TESTS/ SAMPLING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA (Rock type, strength, Weathering, color, fabric, grain size, inclusions, degree of fracturing)	WEATHERING	STRENGTH Is (50) MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	RQD (%)	DEFECT SPACING (mm) (0-19, 20-49, 50-99, 100-199, 200-599, >600)	DEFECT LOG	DEFECT DESCRIPTION (Defect type, inclination, shape, roughness, infill, thickness)
NMLC - DIAMOND IMPREGNATED BIT				17		SILTSTONE, high strength, distinctly to slightly weathered, pale brown and pale grey, with some fine to coarse grained sand, with some interbeded sandstone band and medium to gravel size quartz and quartz band, with some clay infilling along joints, with			33			Hand Break JN, 45*, Pl, SR JN, 70*, Pl-Ir, SR, Fe JN, 45*, Pl, SR, Fe JN, 60*, Pl, S, Fe JN, 45*, Pl, S, Fe DZ, 45*, 17.58 to 17.73m
				18		Core Loss 17.73 to 18.53m			18 50			DZ, 15*, 18.53 to 18.6m
				19		SILTSTONE; as above Quartz Band, 60*, 5 to 6mm thick Quartz Band, 20*, 4 to 10mm thick Quartz Band, 70*, 2 to 5mm thick Quartz Band, 65*, 2 to 6mm thick			19 42			Drilling Induced Break DZ, 45*, 18.91 to 19.06m DZ, 10*, 19.34 to 19.46m JN, Sub-Vertical, 19.52 to 19.86m, Pl, SR, Fe
				20		BH1 Coring Terminated at 20m, Target Depth Reached						
				21								
				22								

URS	TITLE: **CORE PHOTOGRAPHY** **BH1 1.4m to 5m** **Box 1 of 4**	CLIENTS: **Union Fenosa Wind Australia**	PROJECT: **Paling Yards Wind Farm**	
			DATE: **26/07/2011**	PROJECT NO: **43167888**

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URS	TITLE: **CORE PHOTOGRAPHY** **BH1 6m to 10.58m** **Box 2 of 4**	CLIENTS: **Union Fenosa Wind Australia**	PROJECT: **Paling Yards Wind Farm**	
			DATE: **26/07/2011**	PROJECT NO: **43167888**

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URS	TITLE: **CORE PHOTOGRAPHY** **BH1 10.6m to 15m** **Box 3 of 4**	CLIENTS: **Union Fenosa Wind Australia**	PROJECT: **Paling Yards Wind Farm**	
			DATE: **26/07/2011**	PROJECT NO: **43167888**

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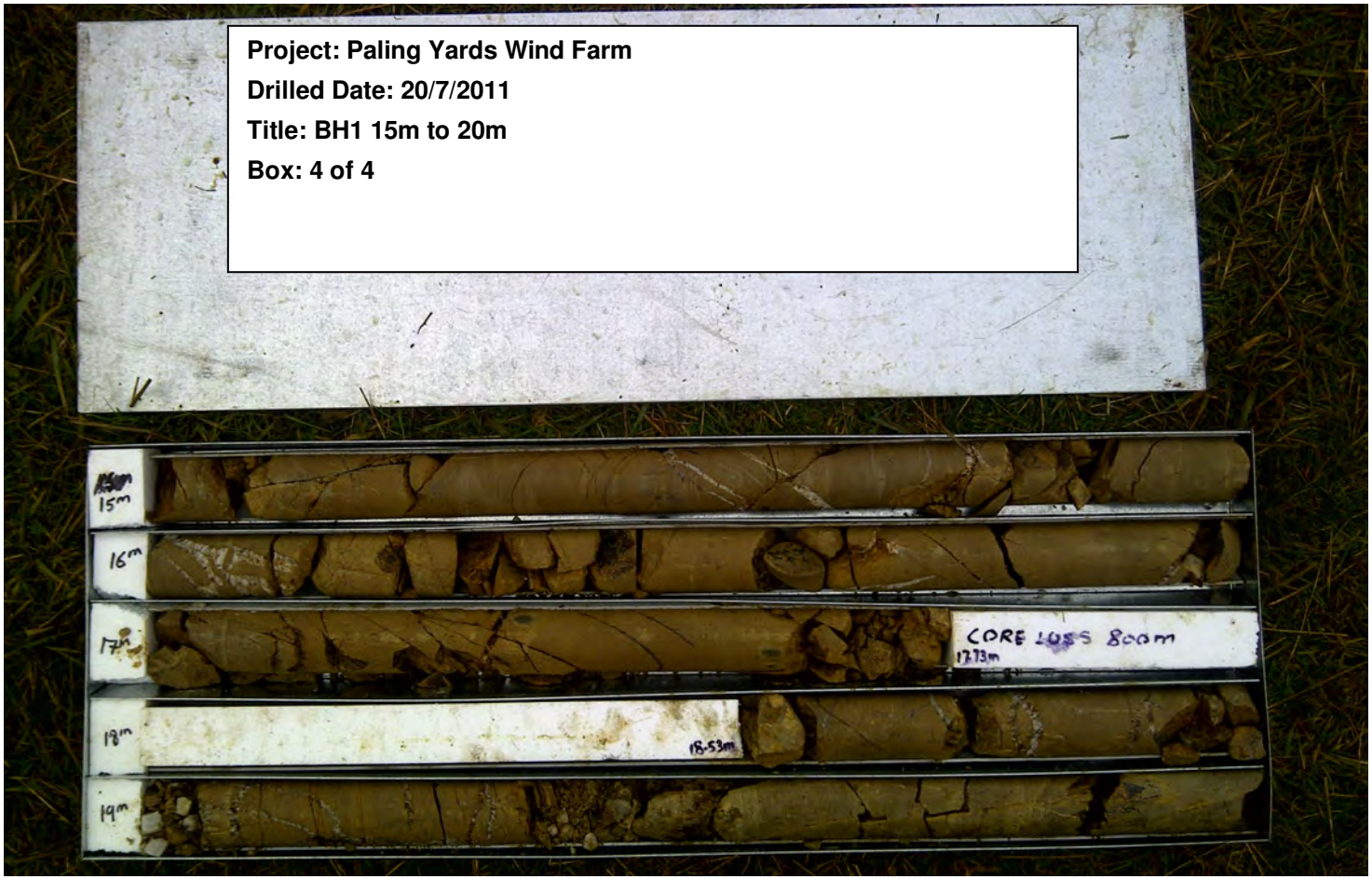

URS	TITLE: **CORE PHOTOGRAPHY** **BH1 15m to 20m** **Box 4 of 4**	CLIENTS: **Union Fenosa Wind Australia**	PROJECT: **Paling Yards Wind Farm**	
			DATE: **26/07/2011**	PROJECT NO: **43167888**

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URS Non-cored Hole

BOREHOLE BH-02

URS Australia Pty Ltd
Lvl 4, 407 Pacific Highway, Artarmon, NSW
Phone: +61.2.8925 5500
Fax: +61.2.8925 5555

Drilling Contractor: **Strategic Drilling Services**

Project Reference: **Paling Yards Wind Farm**

Project No.: **43167888**

Client: **Union Fenosa Wind Australia**

Location: **Paling Yards, NSW**

Logged By: **T Huang**
Checked By: **D Tulasi**
Date Started: **7-7-11**
Date Finished: **7-7-11**

Bore Size: **150 mm**
Total Depth: **5.10 m**
Casing Size: **mm**

Relative Level: **1000.00 mRL**
Coordinates: **6217768.20 mN**
753669.52 mE
Permit No:

Drill Type: **SFA Auger "TC" Bit**
Drill Model: **CME 55LC track mounted drilling rig**
Drill Fluid: **N/A**

SAMPLE TYPE	RUN (m)	FIELD SHEAR STRENGTH (kPa)	PENETROMETER BLOWS (N)	SAMPLING AND OTHER TESTING	GROUND WATER DATA AND COMMENTS	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA	MOISTURE CONDITION	USCS	CONSISTENCY/ DENSITY	GEOLOGICAL DESCRIPTION
						0		Silty SAND, fine grained, pale brown, grass covered, Topsoil	M/W	-	-	Topsoil
								Sandy CLAY, medium to high plasticity, brown and pale brown, with a trace of gravel, Residual	M	CH	St	Residual
						1						
SPT			n = 18	SPT at 2m 6, 8, 10		2		Silty CLAY, medium plasticity, pale brown, mottled orange, with a trace of gravel, Residual	D/M	CL	VSt	Residual
						3						
SPT			n = 12	SPT at 4m 3, 4, 8		4						

URS Non-cored Hole

BOREHOLE BH-02

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Fax: +61.2.8925 5555

Project No.: **43167888**

Project Reference: **Paling Yards Wind Farm**

SAMPLE TYPE	RUN (m)	FIELD SHEAR STRENGTH (kPa)	PENETROMETER BLOWS (N)	SAMPLING AND OTHER TESTING	GROUND WATER DATA AND COMMENTS	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA	MOISTURE CONDITION	USCS	CONSISTENCY/ DENSITY	GEOLOGICAL DESCRIPTION
						5		Silty CLAY, medium plasticity, pale brown, mottled orange, with a trace of gravel, Residual	D/M	CL	VSt	Residual
								TC Bit Refusal, End of Non-Cored Log at 5.1m, Continues as Cored Log				

URS Cored Borehole

BOREHOLE BH-02

URS Australia PTY LTD
Lv4, 407 Pacific Hwy, Artarmon NSW 2064
Phone: +61 2 8925 5500
Fax: +61 2 8925 5555

Drilling Contractor: **Strategic Drilling Services**

Project Reference: **Paling Yards Wind Farm**

Project No.: **43167888**

Client: **Union Fenosa Wind Australia**

Location: **Paling Yards, NSW**

Logged By: **T Huang**
Checked By: **D Tulasi**
Date Started: **20-7-11**
Date Finished: **21-7-11**

Bore Size: **100 mm**
Casing Size: **mm**
Total Depth: **19.72 m**
Borehole Inclination and Bearing: **90° from horizontal at ° True North**

Relative Level: **1000.00 mRL**
Coordinates: **6217768.20 mN 753669.52 mE**
Permit No:

Drill Type: **NMLC - Diamond Impreg. Bit**
Drill Model: **CME 55LC track mounted drilling rig**
Drill Fluid: **N/A**

DRILLING

METHOD: NMLC - DIAMOND IMPREGNATED BIT
WATER
RUN/RECOVERY
FIELD TESTS/ SAMPLING: D=1.92 A=3.83; D=0.18 A=0.21
DEPTH (m)

MATERIAL DESCRIPTION

GRAPHIC LOG
DESCRIPTION OF STRATA (Rock type, strength, Weathering, color, fabric, grain size, inclusions, degree of fracturing)
WEATHERING
STRENGTH Is (50) MPa: EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH
RQD (%)

Continues from Non-Cored Log at 5.1m

BASALT, high strength, slightly weathered to fresh rock, dark grey to black, massive, slightly fractured — SW / FR

CLAYSTONE, very low to low strength, extremely weathered, brown and red, with some extremely weathered basalt, fractured — XW

RQD: 69, 86, 84, 74, 16

DISCONTINUITY DESCRIPTION

DEFECT SPACING (mm): 0-19, 20-49, 50-99, 100-199, 200-599, >600
DEFECT LOG

DEFECT DESCRIPTION (Defect type, inclination, shape, roughness, infill, thickness)

- DZ, 10*, 5.1 to 5.2m
- JN, 60*, Ir, R, Fe
- Drilling Induced Break
- JN, 25*, Pl, SR
- Hand Break
- JN, 20*, Pl-Ir, R, Fe
- JN, 20*, Pl, SR, Fe
- Hand Break
- JN, 45*, Pl, SR, Fe
- Drilling Induced Break
- JN, 35*, Pl, SR, Fe
- Drilling Induced Break
- Hand Break
- JN, Sub-Vertical, 8.34 to 8.6m, Ir, SR
- DZ, 0*, 8.69 to 8.73m
- Drilling Induced Break
- DZ, 0*, 8.97 to 9.05m
- JN, Sub-Vertical, 9.16 to 9.34m, Ir, R
- DZ, 0*, 9.5 to 9.74m
- Drilling Induced Break

Remarks: Point Load Strength (Is50) results for diametral and axial test are displayed as D and A respectively

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URS Cored Borehole

BOREHOLE BH-02

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Project No.: **43167888**

Project Reference: **Paling Yards Wind Farm**

NMLC - DIAMOND IMPREGNATED BIT

DRILLING					MATERIAL DESCRIPTION				DISCONTINUITY DESCRIPTION		
METHOD	WATER	RUN/RECOVERY	FIELD TESTS/ SAMPLING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA (Rock type, strength, Weathering, color, fabric, grain size, inclusions, degree of fracturing)	WEATHERING	STRENGTH Is (50) MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	RQD (%)	DEFECT SPACING (mm) (0-19, 20-49, 50-99, 100-199, 200-599, >600)	DEFECT LOG	DEFECT DESCRIPTION (Defect type, inclination, shape, roughness, infill, thickness)
				10								Hand Break DZ, 0*, 10.05 to 10.08m
												DZ, 0*, 10.2 to 10.35m
						BASALT and BRECCIA, medium to high strength, distinctly weathered, dark brown and grey, massive, with some interbeded sandstone band and iron staining, with a trace of clay infilling along joints, fractured	DW		37			DZ, 5*, 10.43 to 10.64m
				11					11			Drilling Induced Break JN, 30*, Ir, R, Fe JN, 10-20*, Ir, R, Fe
						Interbeded Sandstone Band, 0*, 300mm thick			57			Drilling Induced Break
				12					12			Hand break DZ, 0*, 12.05 - 12.23m
						BASALT, medium to high strength, distinctly weathered, grey to dark grey, massive, with a trace of iron staining and clay infilling along joints, fractured			18			Drilling Induced Break DZ, 5*, 12.42 to 12.5m Drilling Induced Break
						Interbeded Sandstone Band, 5*, 150mm thick						DZ, 5*, 12.88 to 13m
				13					13			DZ, 5*, 13.12 to 13.16m
			D=0.6 A=0.69						59			Drilling Induced Break
				14					14			Hand Break
												DZ, 0*, 14.22 to 14.29m
									26			Drilling Induced Break JN, 45*, Ir, R, Fe JN, 45*, Ir, R, Fe Drilling Induced Break DZ, 0*, 14.47 to 14.96m
				15					15			DZ, 0*, 15 to 15.06m Drilling Induced Break DZ, 0*, 15.26 to 15.73m
						BASALT, medium to high strength, distinctly weathered, grey to dark grey, massive, with a trace of iron staining and clay infilling along joints, fragmented						
						Core Loss 15.73 to 16.09m						

URS Cored Borehole

BOREHOLE BH-02

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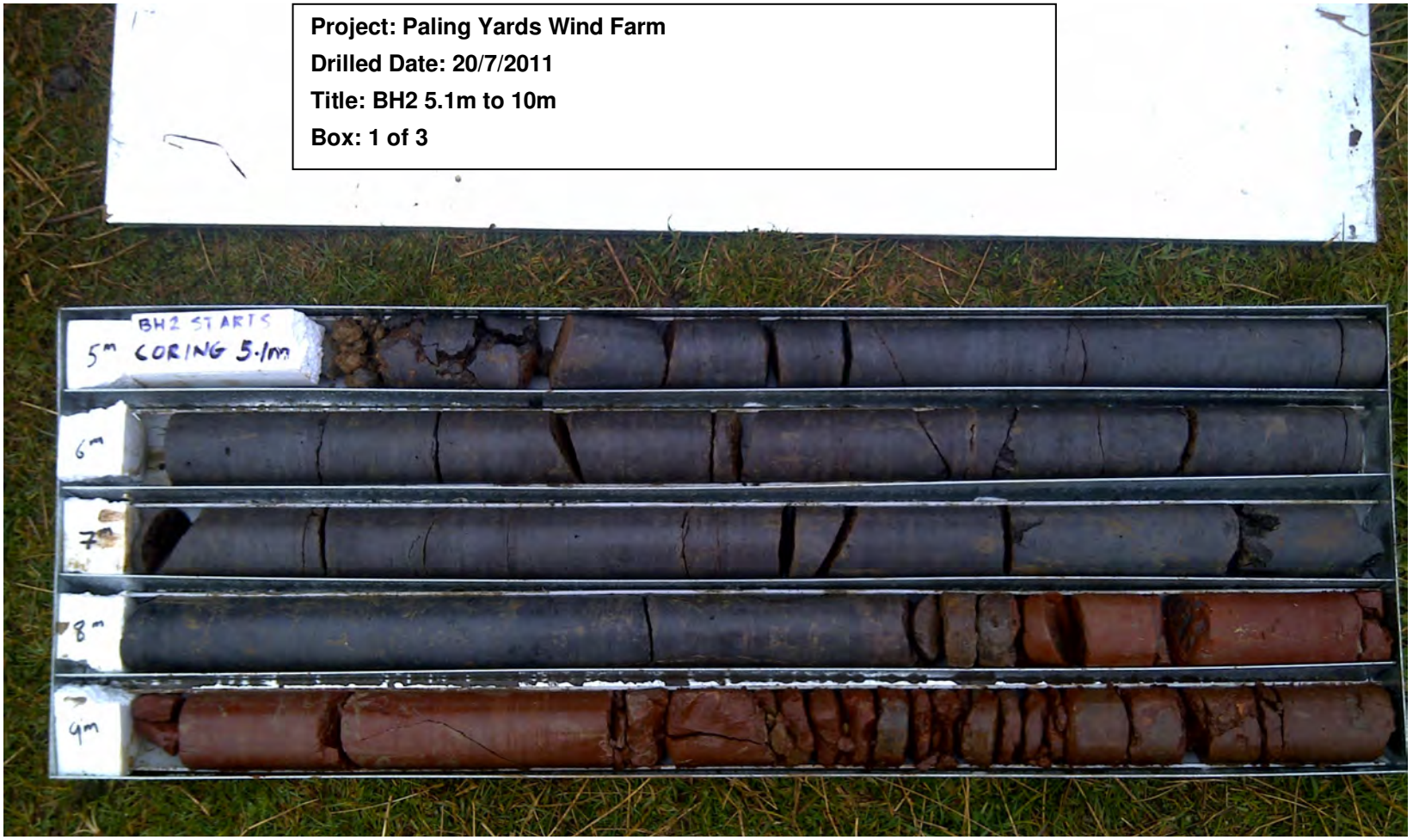
Project No.: **43167888**

Project Reference: **Paling Yards Wind Farm**

DRILLING					MATERIAL DESCRIPTION					DISCONTINUITY DESCRIPTION		
METHOD	WATER	RUN/RECOVERY	FIELD TESTS/ SAMPLING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA (Rock type, strength, Weathering, color, fabric, grain size, inclusions, degree of fracturing)	WEATHERING	STRENGTH Is (50) MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	RQD (%)	DEFECT SPACING (mm) (0-19, 20-49, 50-99, 100-199, 200-599, >600)	DEFECT LOG	DEFECT DESCRIPTION (Defect type, inclination, shape, roughness, infill, thickness)
NMLC - DIAMOND IMPREGNATED BIT				16		BASALT, medium to high strength, distinctly weathered, grey to dark grey, massive, with a trace of iron staining and clay infilling along joints, fragmented			16.09 14			DZ, 0*, 16.09 to 16.23m DZ, 0*, 16.28 to 17m
				17		Core Loss 17 to 17.13m BASALT; as above			17.15 25			DZ, 0*, 17.13 to 17.7m DZ, 0*, 17.77 to 17.85m
			D=0.92 A=N/A	18		Become fractured to slightly fractured			18 21			JN, 45*, Ir, R, Fe Drilling Induced Break JN, 15-20*, Ir, R, Fe Drilling Induced Break DZ, 0*, 18.35 to 18.59m
				19					19 18			Drilling Induced Break DZ, 0*, 18.92 to 19m JN, Sub-Vertical, 19.19 to 19.42m, Ir, SR, Fe JN, 45*, Pl, R, Fe DZ, 0*, 19.4 to 19.5m JN, 20*, Ir, R, Fe JN, 20*, Ir, R, Fe
				20		BH2 Coring Terminated at 19.72m, Target Depth Reached						
				21								

Project: Paling Yards Wind Farm
Drilled Date: 20/7/2011
Title: BH2 5.1m to 10m
Box: 1 of 3



URS	TITLE: **CORE PHOTOGRAPHY** **BH2 5.1m to 10m** **Box 1 of 3**	CLIENTS: **Union Fenosa Wind Australia**	PROJECT: **Paling Yards Wind Farm**	
			DATE: **26/07/2011**	PROJECT NO: **43167888**

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URS	TITLE: **CORE PHOTOGRAPHY** **BH2 10m to 15m** **Box 2 of 3**	CLIENTS: **Union Fenosa Wind Australia**	PROJECT: **Paling Yards Wind Farm**	
			DATE: **26/07/2011**	PROJECT NO: **43167888**

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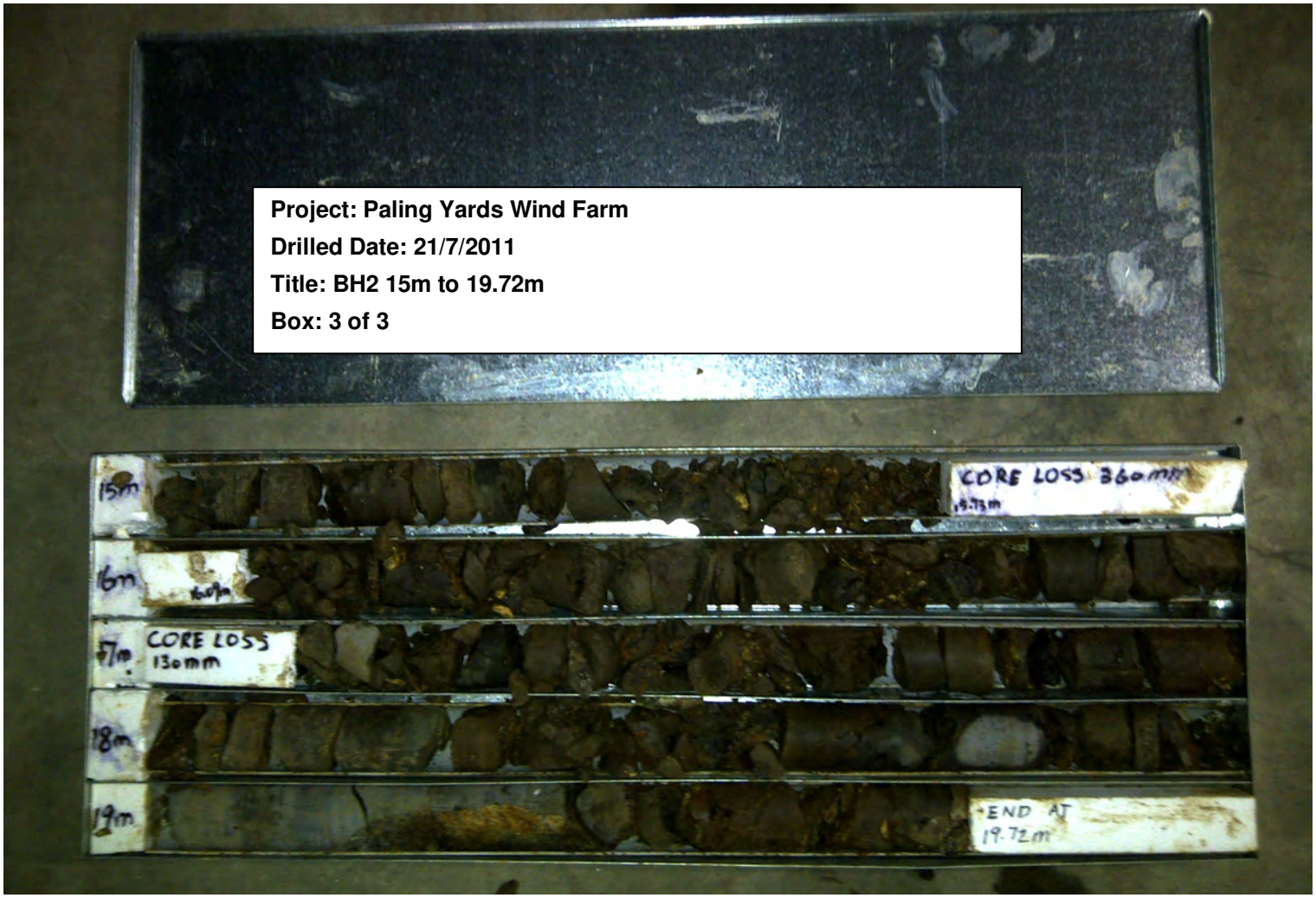

URS	TITLE: **CORE PHOTOGRAPHY** **BH2 15m to 19.72m** **Box 3 of 3**	CLIENTS: **Union Fenosa Wind Australia**	PROJECT: **Paling Yards Wind Farm**	
			DATE: **26/07/2011**	PROJECT NO: **43167888**

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F

Appendix F Laboratory Test Results

ANALYTICAL REPORT

9 June 2011

SGS Industrial CMT Eastern Sydney
Unit 15, 33 Maddox Street
PO Box 6432
ALEXANDRIA
NSW 2015

Attention: **Simon Rosam**

Your Reference: URS Aust Paling Yards Wind Farm Project 43167888

Our Reference: SE88017 Samples: 10 Soils
Received: 2/06/2011

Preliminary Report Sent: Not Issued

These samples were analysed in accordance with your written instructions.

For and on Behalf of:
SGS ENVIRONMENTAL SERVICES

Sample Receipt:	Angela Mamalicos	AU.SampleReceipt.Sydney@sgs.com
Production Manager:	Huong Crawford	Huong.Crawford@sgs.com

Results Approved and/or Authorised by:

Dong Liang
Inorganic/Metal Supervisor

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Inorganics Our Reference: Your Reference Sample Matrix	UNITS ---------- ----------	SE88017-1 TP08 0.4-0.7m Soil	SE88017-2 TP17 0.4-0.7m Soil	SE88017-3 TP25 0.5-0.8m Soil	SE88017-4 TP33 0.4-0.7m Soil	SE88017-5 TP39 0.4-0.7m Soil
Date Extracted- (pH 1:5 soil: Water)		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed (pH 1:5 Soil: Water)		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
pH 1:5 soil:water	pH Units	7.0	6.9	6.2	6.9	5.7

Inorganics Our Reference: Your Reference Sample Matrix	UNITS ---------- ----------	SE88017-6 TP53 0.4-0.7m Soil	SE88017-7 TP12 1.6-1.7m Soil	SE88017-8 TP16 1.1-1.2m Soil	SE88017-9 TP38 1.3-1.4m Soil	SE88017-1 0 TP60 1.5-1.6m Soil
Date Extracted- (pH 1:5 soil: Water)		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed (pH 1:5 Soil: Water)		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
pH 1:5 soil:water	pH Units	6.2	6.8	6.9	6.0	5.9

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Anions in soil Our Reference: Your Reference Sample Matrix	UNITS ---------- ----------	SE88017-1 TP08 0.4-0.7m Soil	SE88017-2 TP17 0.4-0.7m Soil	SE88017-3 TP25 0.5-0.8m Soil	SE88017-4 TP33 0.4-0.7m Soil	SE88017-5 TP39 0.4-0.7m Soil
Date Extracted		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Chloride, Cl 1:5 soil:water	mg/kg	22	14	3.7	30	56
Sulphate, SO4 1:5 soil:water	mg/kg	6.4	47	11	12	16

Anions in soil Our Reference: Your Reference Sample Matrix	UNITS ---------- ----------	SE88017-6 TP53 0.4-0.7m Soil	SE88017-7 TP12 1.6-1.7m Soil	SE88017-8 TP16 1.1-1.2m Soil	SE88017-9 TP38 1.3-1.4m Soil	SE88017-10 TP60 1.5-1.6m Soil
Date Extracted		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Date Analysed		9/06/2011	9/06/2011	9/06/2011	9/06/2011	9/06/2011
Chloride, Cl 1:5 soil:water	mg/kg	4.3	23	2.4	4.8	7.3
Sulphate, SO4 1:5 soil:water	mg/kg	27	8.7	1.4	0.7	<0.5

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Moisture Our Reference: Your Reference Sample Matrix	UNITS ---------- ----------	SE88017-1 TP08 0.4-0.7m Soil	SE88017-2 TP17 0.4-0.7m Soil	SE88017-3 TP25 0.5-0.8m Soil	SE88017-4 TP33 0.4-0.7m Soil	SE88017-5 TP39 0.4-0.7m Soil
Date Analysed (moisture)		7/06/2011	7/06/2011	7/06/2011	7/06/2011	7/06/2011
Moisture	%	18	25	16	17	11

Moisture Our Reference: Your Reference Sample Matrix	UNITS ---------- ----------	SE88017-6 TP53 0.4-0.7m Soil	SE88017-7 TP12 1.6-1.7m Soil	SE88017-8 TP16 1.1-1.2m Soil	SE88017-9 TP38 1.3-1.4m Soil	SE88017-1 0 TP60 1.5-1.6m Soil
Date Analysed (moisture)		7/06/2011	7/06/2011	7/06/2011	7/06/2011	7/06/2011
Moisture	%	18	19	21	25	19

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Method ID	Methodology Summary
AN101	pH - Measured using pH meter and electrode based on APHA 21st Edition, 4500-H+. For water analyses the results reported are indicative only as the sample holding time requirement specified in APHA was not met (APHA requires that the pH of the samples are to be measured within 15 minutes after sampling).
AN245	A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN002	

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QUALITY CONTROL Inorganics	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted- (pH 1:5 soil: Water)				[NT]	SE88017-10	9/06/2011 || 9/06/2011
Date Analysed (pH 1:5 Soil: Water)				[NT]	SE88017-10	9/06/2011 || 9/06/2011
pH 1:5 soil:water	pH Units	0	AN101	[NT]	SE88017-10	5.9 || 5.9 || RPD: 0

QUALITY CONTROL Anions in soil	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				9/06/2011	SE88017-1	9/06/2011 || 9/06/2011	SE88017-2	9/06/2011
Date Analysed				9/06/2011	SE88017-1	9/06/2011 || 9/06/2011	SE88017-2	9/06/2011
Chloride, Cl 1:5 soil:water	mg/kg	0.25	AN245	<0.2	SE88017-1	22 || 22 || RPD: 0	SE88017-2	101%
Sulphate, SO4 1:5 soil:water	mg/kg	0.5	AN245	<0.5	SE88017-1	6.4 || 6.7 || RPD: 5	SE88017-2	99%

QUALITY CONTROL Moisture	UNITS	LOR	METHOD	Blank
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	<1

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Result Codes

[INS] : Insufficient Sample for this test
[NR] : Not Requested
[NT] : Not tested
[LOR] : Limit of reporting
[RPD] : Relative Percentage Difference
* : Not part of NATA Accreditation
[N/A] : Not Applicable

Report Comments

Samples analysed as received. Solid samples expressed on a dry weight basis.
Date Organics extraction commenced:
NATA Corporate Accreditation No. 2562, Site No 4354
Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*)

Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.
Duplicate: A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.
Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.
Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.
Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.
Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

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POINT LOAD STRENGTH INDEX

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yard Wind Farm**

LAB. NO.	SAMPLE SOURCE	LITHOLOGY	PLATEN SEPARATION DIAM (mm)	PLATEN SEPARATION HEIGHT (mm)	TEST ORIENTATION	POINT LOAD STRENGTH Is (MPa)	POINT LOAD STRENGTH $Is_{(50)}$ (MPa)	Type OF FAILURE
68234	BH1-1 5.67 to 5.75m	Not supplied.	60.7	38.2	Diametral Axial	0.36 0.74	0.39 0.77	FOB FOB
68235	BH1-2 9.23 to 9.34m	"	61.1	*	Diametral Axial	0.53 -	0.58 -	FOB -
68236	BH1-3 12.79 to 13m	"	60.7	39.9	Diametral Axial	1.54 1.39	1.68 1.46	FOB FOB
68237	BH1-4 15.6 to 15.7m	"	61.1	46.0	Diametral Axial	0.38 0.82	0.41 0.88	FIP FIP
68238	BH2-1 6.83 to 6.97m	"	60.7	43.5	Diametral Axial	1.76 3.59	1.92 3.83	FOB FOB
68239	BH2-2 8.83 to 8.91m	"	60.9	41.0	Diametral Axial	0.17 0.20	0.18 0.21	CPF FOB
68240	BH2-3 13.56 to 13.68m	"	61.1	42.4	Diametral Axial	0.55 0.65	0.60 0.69	FOB FOB
68241	BH2-4 18.68 to 18.8m	"	60.2	*	Diametral Axial	0.84 -	0.92 -	FIP -

NOTES TO TESTING

Testing Device: ELE Point Load Tester

Sample History: Unsoaked

Sampled By: Client

Job Number: 119-259

Date Tested: 02.08.11

Test Method: AS 4133.4.1 2007

Failure Type
- FOB Fracture through fabric of specimen oblique to bedding not influenced by weak planes
- FB Fracture along bedding
- FIP Fracture influenced by pre-existing plane, microfracture, vein, chemical alteration
- CPF Chip or partial fracture

* Insufficient sample to test due to failure on diametral test.

Approved Signatory: Chris Lloyd **Date:** 03.08.11

ilac-MRA NATA
Accreditation No. 1452

This document is issued in accordance with NATA's accreditation requirements

This is a re-issue of the report dated 02.08.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65694

Sample Source: TP08 0.4m to 0.7m

Sample Description: SILTY CLAY: light brown, high plasticity, with fine to coarse gravel, trace of fine to coarse sand.

1. IMMERSION

Does not slake	→	Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.5.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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Accreditation No. 1459

TEST CERTIFICATE

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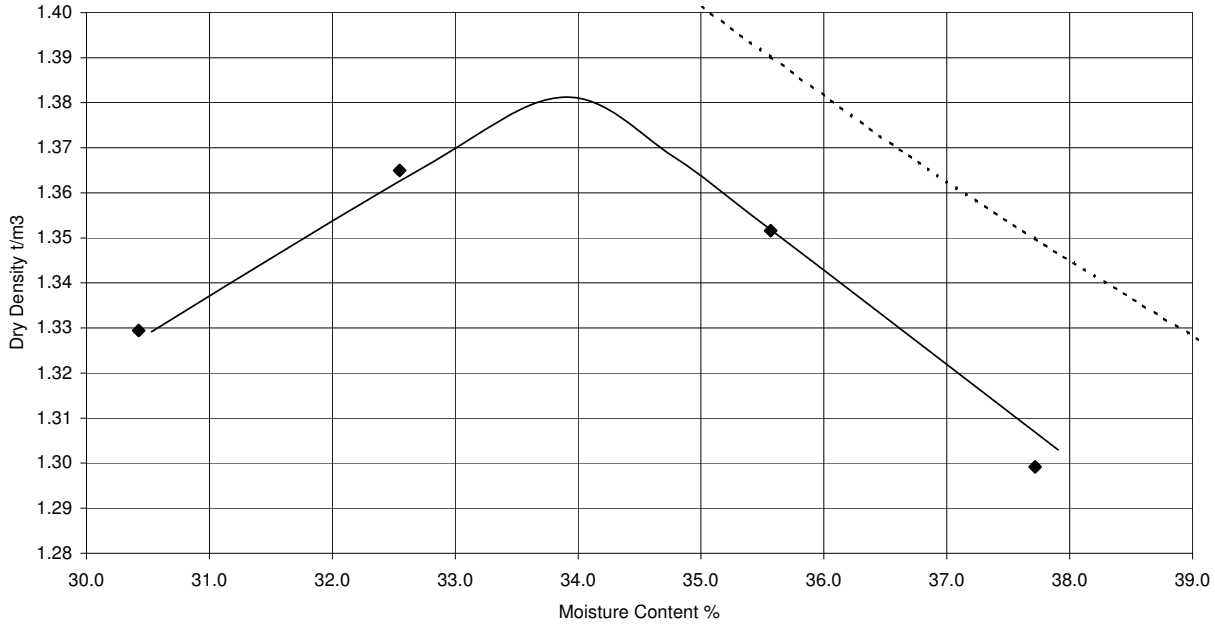
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65694	
Sample Source:	TP08 0.4-0.7m	
Sample Description:	SILTY CLAY: light brown, high plasticity, with fine to coarse gravel, trace of fine to coarse sand.	
Maximum Dry Density:	1.38	t/m^3
Optimum Moisture Content:	34.0	%
Oversize Material:	19	mm
% Oversize:	7	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.75	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP08 0.4-0.7m	
Sample Description:	SILTY CLAY: light brown, high plasticity, with fine to coarse gravel, trace of fine to coarse sand.	
Job Number:	119-253	
Laboratory Number:	65694	
CBR Value @ 2.5mm	3.0	(%)
CBR Value @ 5.0mm	2.5	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.38	(t/m^3)
Optimum Moisture Content (OMC)	34.0	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.31	(t/m^3)
Dry Density - After Soaking	1.29	(t/m^3)
Retained on 19mm Sieve	7% excluded	(%)
Moisture Content - Before Soaking	33.1	(%)
Laboratory Density Ratio	95.0	(%)
Laboratory Moisture Ratio	97.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	44.8	(%)
Remainder of Test Sample	36.9	(%)
Swell After Soaking	1.5	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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File C:\Electronic Excel Reports\AS1289 6.1.1 California Bearing Ratio, Issue 2, May 2010, JL

TEST CERTIFICATE

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65695

Sample Source: TP17 0.4m to 0.7m

Sample Description: SILTY CLAY: red-brown, high plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.5.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

This document is issued in accordance with NATA's accreditation requirements

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TEST CERTIFICATE

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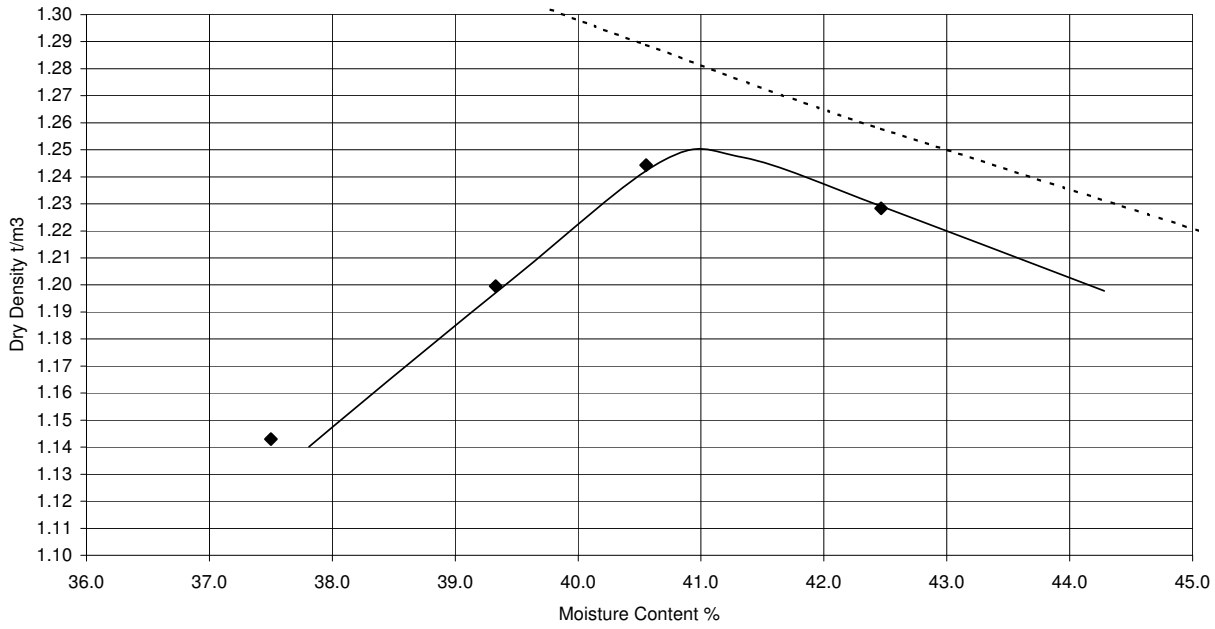
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65695	
Sample Source:	TP17 0.4-0.7m	
Sample Description:	SILTY CLAY: red-brown, high plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.	
Maximum Dry Density:	1.25	t/m^3
Optimum Moisture Content:	41.0	%
Oversize Material:	19	mm
% Oversize:	2	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.70	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP17 0.4-0.7m	
Sample Description:	SILTY CLAY: red-brown, high plasticity, trace of fine to coarse sand, gravel, trace of fine to coarse sand.	
Job Number:	119-253	
Laboratory Number:	65695	
CBR Value @ 2.5mm	1.5	(%)
CBR Value @ 5.0mm	1.5	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.25	(t/m^3)
Optimum Moisture Content (OMC)	41.0	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.17	(t/m^3)
Dry Density - After Soaking	1.13	(t/m^3)
Retained on 19mm Sieve	2% excluded	(%)
Moisture Content - Before Soaking	41.6	(%)
Laboratory Density Ratio	94.0	(%)
Laboratory Moisture Ratio	101.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	54.2	(%)
Remainder of Test Sample	46.1	(%)
Swell After Soaking	3.9	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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File C:\Electronic Excel Reports\AS1289 6.1.1 California Bearing Ratio, Issue 2, May 2010, JL

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65696

Sample Source: TP21 0.4m to 0.7m

Sample Description: SILTY CLAY: brown, high plasticty, trace of fine to coarse sand, trace of fine to coarse gravel.

1. IMMERSION

Does not slake	→	Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.5.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

This document is issued in accordance with NATA's accreditation requirements

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Alexandria NSW 2015
Australia

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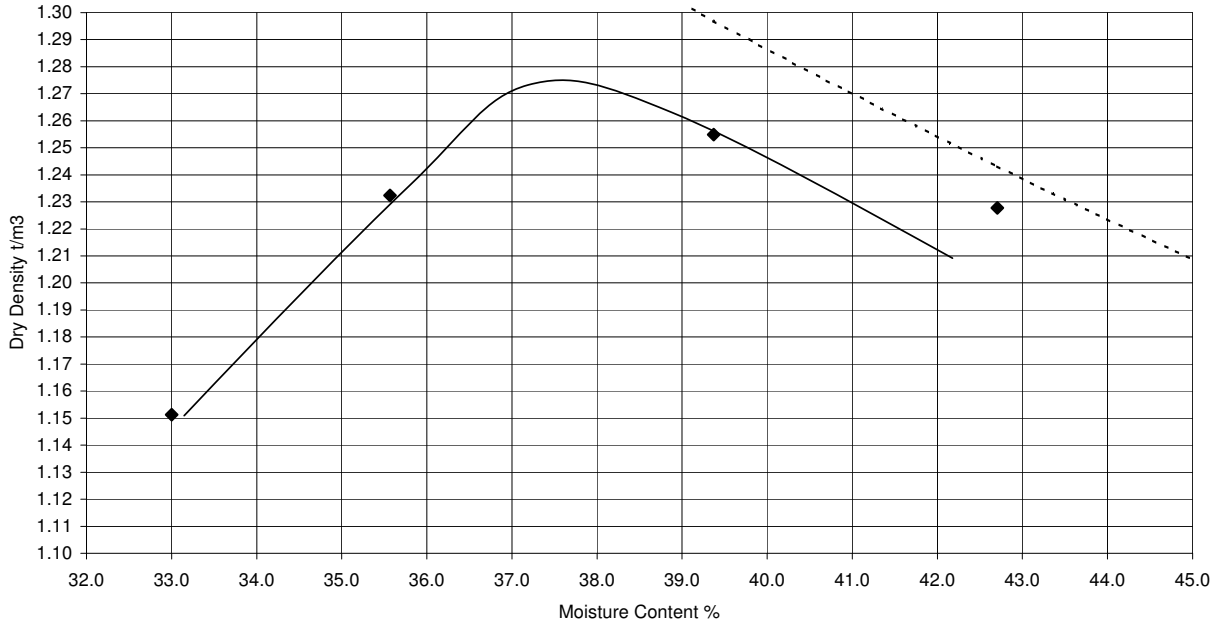
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65696	
Sample Source:	TP21 0.4-0.7m	
Sample Description:	SILTY CLAY: brown, high plasticty, trace of fine to coarse sand, trace of fine to coarse gravel.	
Maximum Dry Density:	1.27	t/m^3
Optimum Moisture Content:	37.5	%
Oversize Material:	19	mm
% Oversize:	11	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.65	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

This document is issued in accordance with NATA's accreditation requirements

Accreditation No. 1459

TEST CERTIFICATE

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Alexandria NSW 2015
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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP21 0.4-0.7m	
Sample Description:	SILTY CLAY: brown, high plasticty, trace of fine to gravel, trace of fine to coarse sand.	
Job Number:	119-253	
Laboratory Number:	65696	
CBR Value @ 2.5mm	1.5	(%)
CBR Value @ 5.0mm	1.5	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.27	(t/m^3)
Optimum Moisture Content (OMC)	37.5	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.21	(t/m^3)
Dry Density - After Soaking	1.18	(t/m^3)
Retained on 19mm Sieve	11% excluded	(%)
Moisture Content - Before Soaking	35.4	(%)
Laboratory Density Ratio	96.0	(%)
Laboratory Moisture Ratio	94.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	48.5	(%)
Remainder of Test Sample	44.6	(%)
Swell After Soaking	3.1	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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Accreditation No. 1459

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65697

Sample Source: TP25 0.5m to 0.8m

Sample Description: SILTY CLAY: dark red-brown, medium plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.

1. IMMERSION

Does not slake	→	Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	
Class 6 no dispersion	X

EMERSION CLASS NO.: 6

Water used:	Distilled water at 20°C	Date Tested:	3.5.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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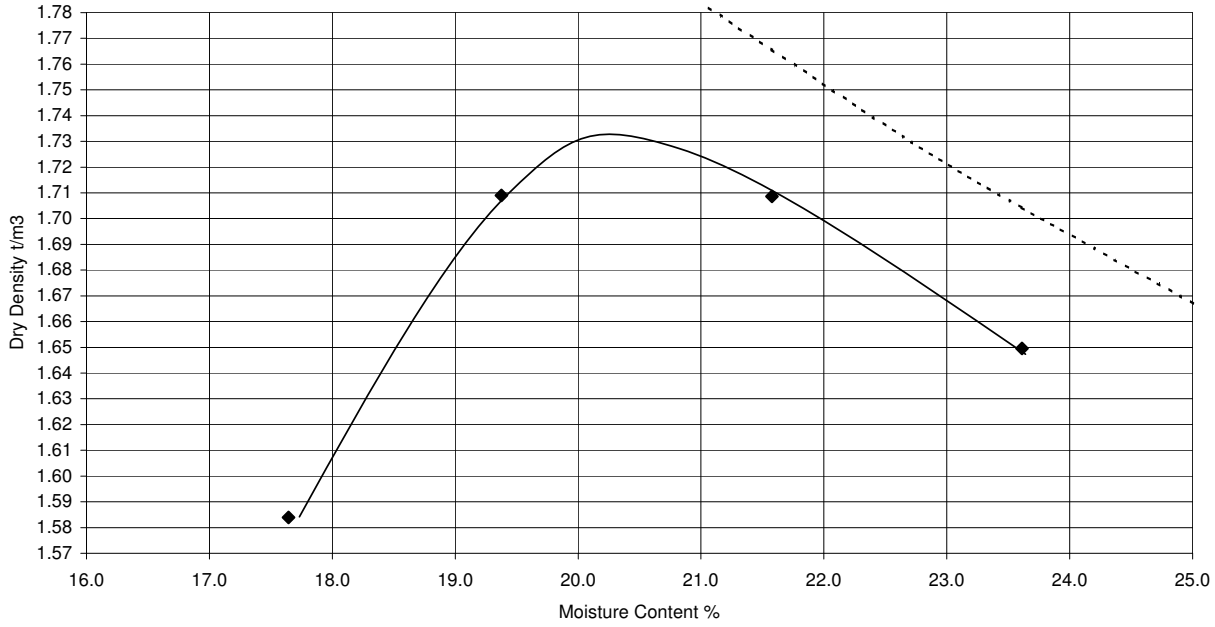
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65697	
Sample Source:	TP25 0.5-0.8m	
Sample Description:	SILTY CLAY: dark red-brown, medium plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.	
Maximum Dry Density:	1.73	t/m^3
Optimum Moisture Content:	20.0	%
Oversize Material:	19	mm
% Oversize:	0	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.85	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP25 0.5-0.8m	
Sample Description:	SILTY CLAY: dark red-brown, medium plasticity, trace of gravel, trace of fine to coarse sand.	
Job Number:	119-253	
Laboratory Number:	65697	
CBR Value @ 2.5mm	8	(%)
CBR Value @ 5.0mm	6	(%)

Sample Data

Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.73	(t/m^3)
Optimum Moisture Content (OMC)	20.0	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	

Sample Preparation

Dry Density - Before Soaking	1.64	(t/m^3)
Dry Density - After Soaking	1.63	(t/m^3)
Retained on 19mm Sieve	0	(%)
Moisture Content - Before Soaking	19.8	(%)
Laboratory Density Ratio	95.0	(%)
Laboratory Moisture Ratio	99.0	(%)

Moisture Content - After Soaking

Top 30mm of Test Sample	23.7	(%)
Remainder of Test Sample	22.2	(%)
Swell After Soaking	0.1	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65698

Sample Source: TP30 0.5m to 0.8m

Sample Description: SILTY CLAY: red brown, medium plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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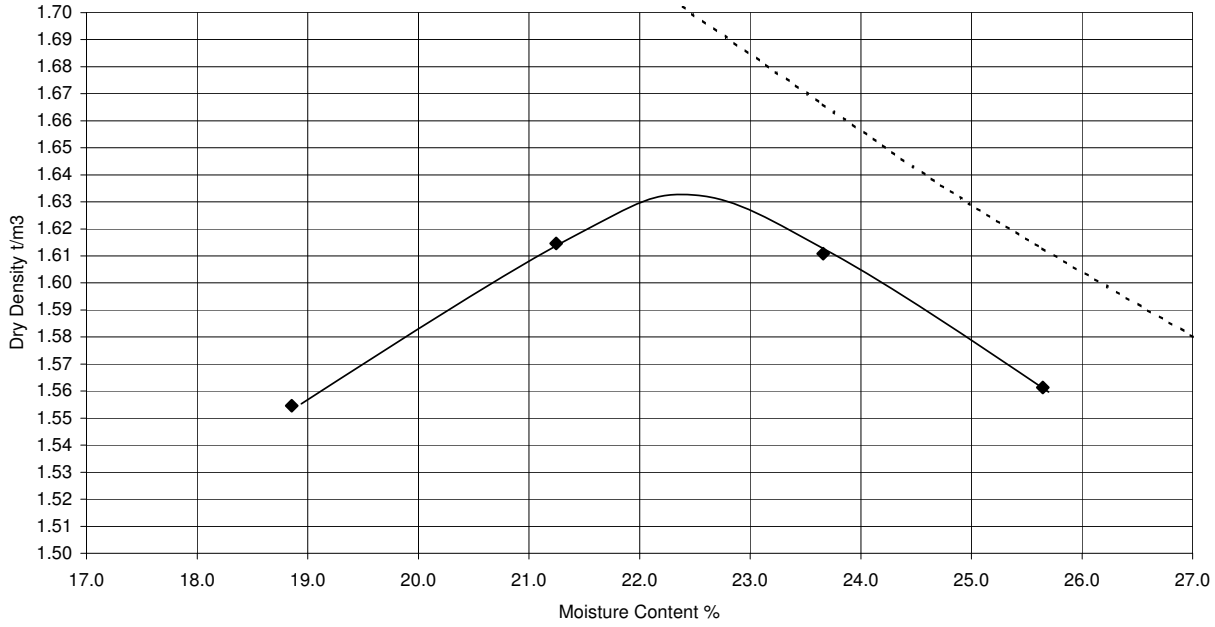
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65698	
Sample Source:	TP30 0.5-0.8m	
Sample Description:	SILTY CLAY: red-brown, medium plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.	
Maximum Dry Density:	1.63	t/m^3
Optimum Moisture Content:	22.5	%
Oversize Material:	19	mm
% Oversize:	0	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.75	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP30 0.5-0.8m	
Sample Description:	SILTY CLAY: red-brown, medium plasticity, trace of fine gravel, trace of fine to coarse sand.	
Job Number:	119-253	
Laboratory Number:	65698	
CBR Value @ 2.5mm	8	(%)
CBR Value @ 5.0mm	6	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.63	(t/m^3)
Optimum Moisture Content (OMC)	22.5	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.54	(t/m^3)
Dry Density - After Soaking	1.53	(t/m^3)
Retained on 19mm Sieve	0	(%)
Moisture Content - Before Soaking	22.7	(%)
Laboratory Density Ratio	94.0	(%)
Laboratory Moisture Ratio	101.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	28.0	(%)
Remainder of Test Sample	13.2	(%)
Swell After Soaking	0.3	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65699

Sample Source: TP33 0.4m to 0.7m

Sample Description: CLAYEY SANDY GRAVEL: brown, fine to coarse gravel, fine to coarse sand, low plasticity.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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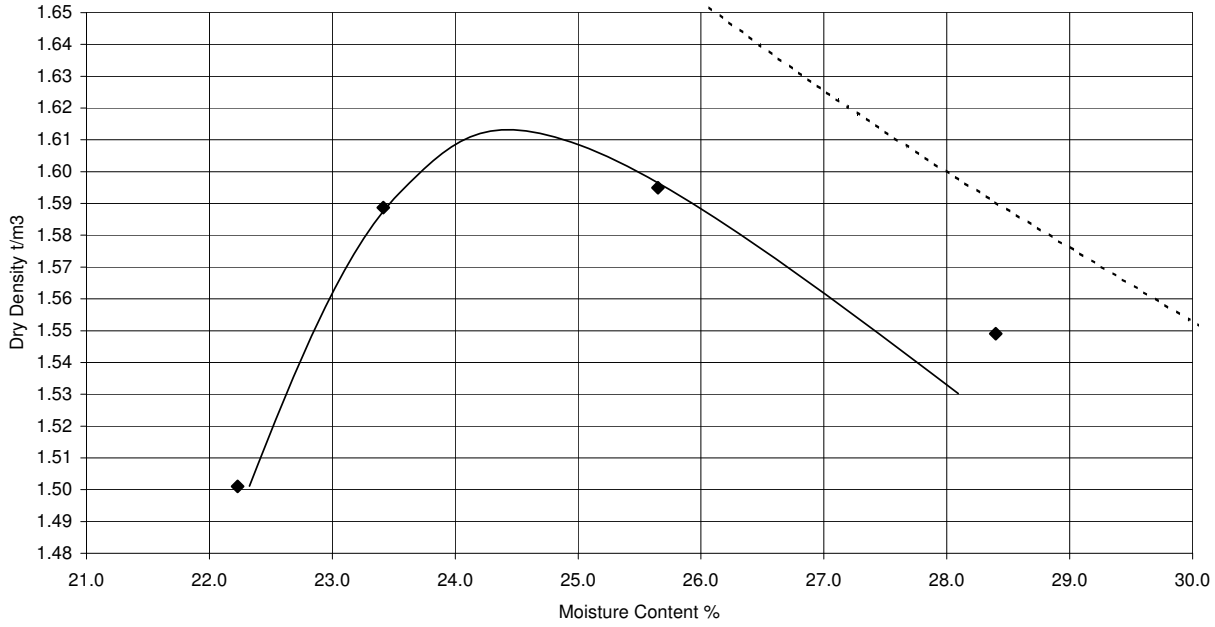
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65699	
Sample Source:	TP33 0.4-0.7m	
Sample Description:	CLAYEY SANDY GRAVEL: brown, fine to coarse gravel, fine to coarse sand, low plasticty.	
Maximum Dry Density:	1.61	t/m^3
Optimum Moisture Content:	24.5	%
Oversize Material:	19	mm
% Oversize:	7	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.90	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP33 0.4-0.7m	
Sample Description:	CLAYEY SANDY GRAVEL: brown, fine to coarse gravel, fine to coarse sand, low plasticty.	
Job Number:	119-253	
Laboratory Number:	65699	
CBR Value @ 2.5mm	10	(%)
CBR Value @ 5.0mm	12	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.61	(t/m^3)
Optimum Moisture Content (OMC)	24.5	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.55	(t/m^3)
Dry Density - After Soaking	1.55	(t/m^3)
Retained on 19mm Sieve	0	(%)
Moisture Content - Before Soaking	25.2	(%)
Laboratory Density Ratio	96.0	(%)
Laboratory Moisture Ratio	103.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	25.4	(%)
Remainder of Test Sample	26.9	(%)
Swell After Soaking	0	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65700

Sample Source: TP39 0.4m to 0.7m

Sample Description: SILTY CLAY: red-brown, medium plasticity, trace of fine coarse sand, trace of fine to coarse gravel.

1. IMMERSION

Does not slake	→	Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	
Class 6 no dispersion	X

EMERSION CLASS NO.: 6

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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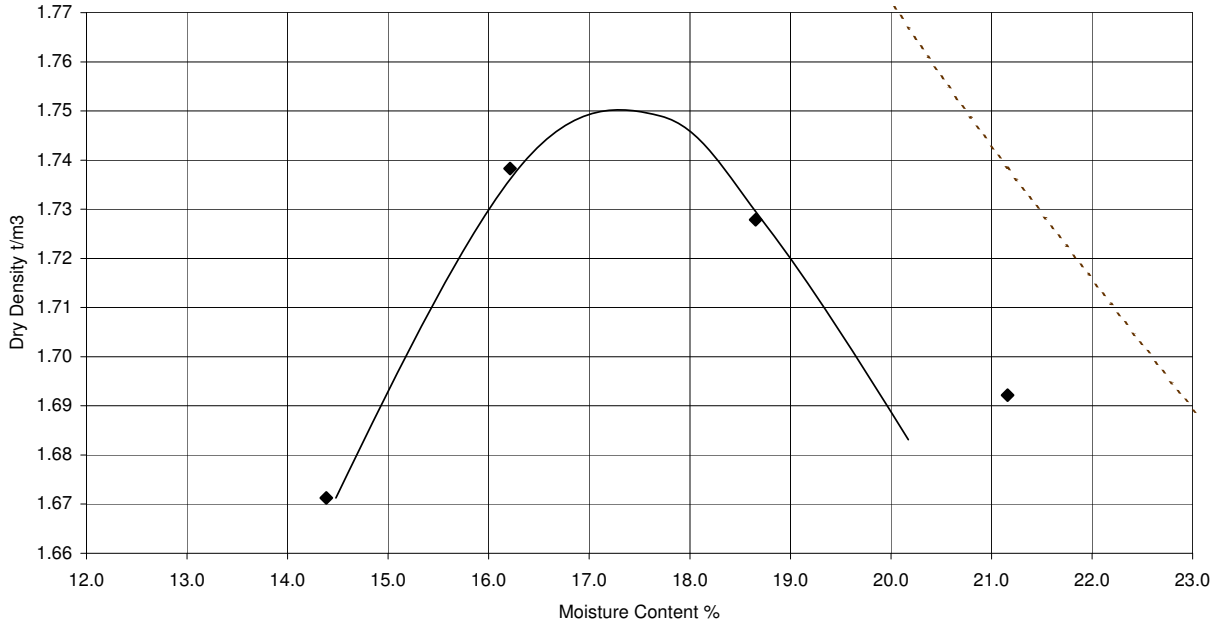
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65700	
Sample Source:	TP39 0.4-0.7m	
Sample Description:	SILTY CLAY: red-brown, medium plasticity, trace of fine coarse sand, trace of fine to coarse gravel.	
Maximum Dry Density:	1.75	t/m^3
Optimum Moisture Content:	17.0	%
Oversize Material:	19	mm
% Oversize:	0	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.75	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP39 0.4-0.7m	
Sample Description:	SILTY CLAY: red-brown, medium plasticity, trace of fine coarse sand, trace of fine to coarse gravel.	
Job Number:	119-253	
Laboratory Number:	65700	
CBR Value @ 2.5mm	5	(%)
CBR Value @ 5.0mm	4	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.75	(t/m^3)
Optimum Moisture Content (OMC)	17.0	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.66	(t/m^3)
Dry Density - After Soaking	1.66	(t/m^3)
Retained on 19mm Sieve	0	(%)
Moisture Content - Before Soaking	17.6	(%)
Laboratory Density Ratio	95.0	(%)
Laboratory Moisture Ratio	104.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	21.8	(%)
Remainder of Test Sample	21.6	(%)
Swell After Soaking	0.2	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65701

Sample Source: TP48 0.4m to 0.7m

Sample Description: SANDY GRAVELLY CLAY: yellow-brown, medium plasticity, fine to coarse gravel, fine to coarse sand.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.5.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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Accreditation No. 1459

TEST CERTIFICATE

SGS Australia Pty Ltd
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Alexandria NSW 2015
Australia

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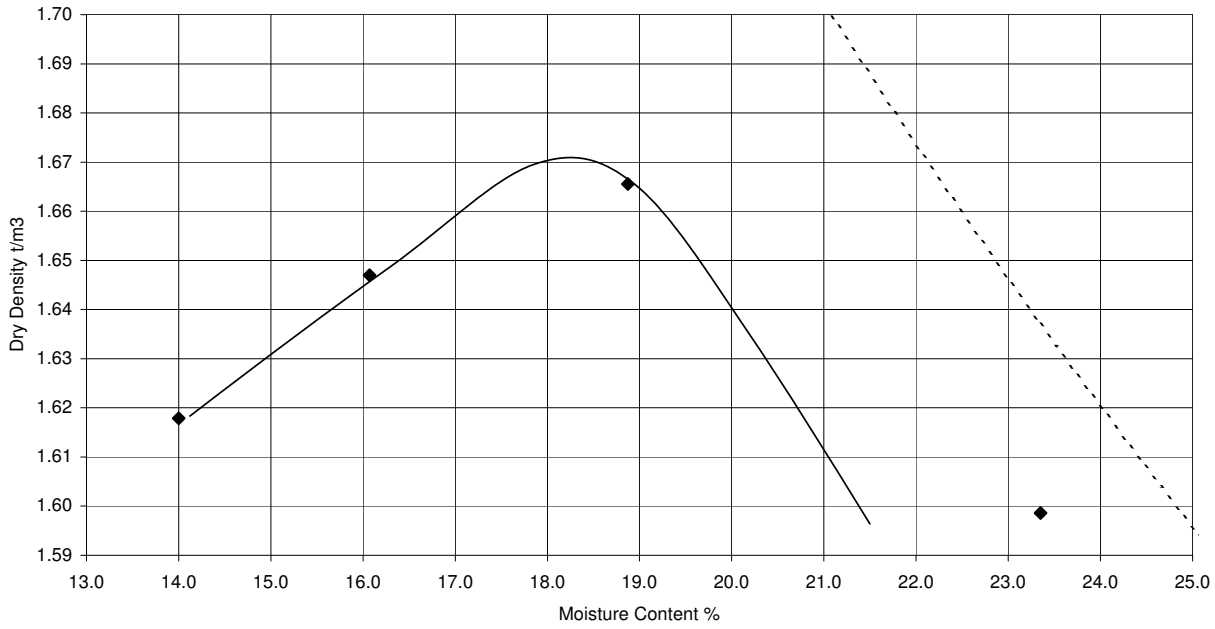
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65701	
Sample Source:	TP48 0.4-0.7m	
Sample Description:	SANDY GRAVELLY CLAY: yellow-brown, medium plasticity, fine to coarse gravel, fine to coarse sand.	
Maximum Dry Density:	1.67	t/m^3
Optimum Moisture Content:	18.0	%
Oversize Material:	19	mm
% Oversize:	19	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.65	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP48 0.4-0.7m	
Sample Description:	SANDY GRAVELLY CLAY: yellow-brown, medium plasticity, fine to coarse gravel, fine to coarse sand.	
Job Number:	119-253	
Laboratory Number:	65701	
CBR Value @ 2.5mm	2.0	(%)
CBR Value @ 5.0mm	2.5	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.67	(t/m^3)
Optimum Moisture Content (OMC)	18.0	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.60	(t/m^3)
Dry Density - After Soaking	1.56	(t/m^3)
Retained on 19mm Sieve	0	(%)
Moisture Content - Before Soaking	17.6	(%)
Laboratory Density Ratio	96.0	(%)
Laboratory Moisture Ratio	98.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	28.4	(%)
Remainder of Test Sample	24.5	(%)
Swell After Soaking	2.2	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65702

Sample Source: TP53 0.4m to 0.7m

Sample Description: GRAVELLY CLAY: dark brown, medium plasticity, fine to coarse gravel, trace of fine to coarse sand.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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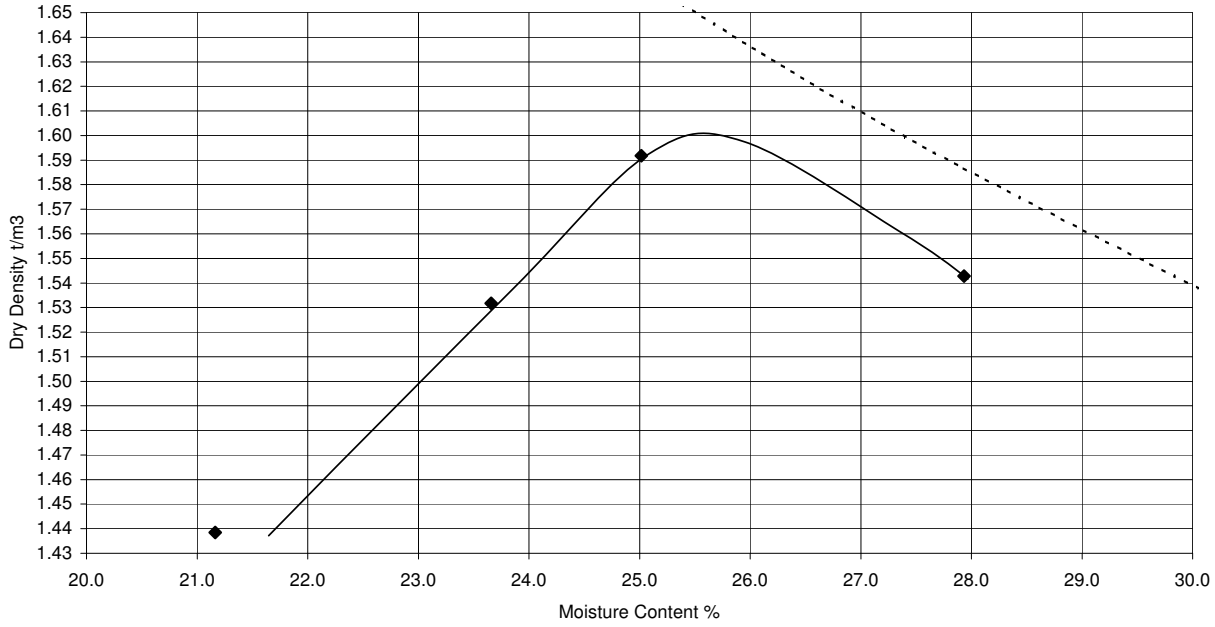
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65702	
Sample Source:	TP53 0.4-0.7m	
Sample Description:	GRAVELLY CLAY: dark brown, medium plasticity, fine to coarse gravel, trace of fine to coarse sand.	
Maximum Dry Density:	1.60	t/m^3
Optimum Moisture Content:	25.5	%
Oversize Material:	19	mm
% Oversize:	24	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.85	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP53 0.4-0.7m	
Sample Description:	GRAVELLY CLAY: dark brown, medium plasticity, fine to coarse gravel, trace of fine to coarse sand.	
Job Number:	119-253	
Laboratory Number:	65702	
CBR Value @ 2.5mm	6	(%)
CBR Value @ 5.0mm	5	(%)

Sample Data

Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.60	(t/m^3)
Optimum Moisture Content (OMC)	25.5	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	

Sample Preparation

Dry Density - Before Soaking	1.53	(t/m^3)
Dry Density - After Soaking	1.53	(t/m^3)
Retained on 19mm Sieve	24% excluded	(%)
Moisture Content - Before Soaking	24.2	(%)
Laboratory Density Ratio	96.0	(%)
Laboratory Moisture Ratio	95.0	(%)

Moisture Content - After Soaking

Top 30mm of Test Sample	30.6	(%)
Remainder of Test Sample	26.2	(%)
Swell After Soaking	0	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)

Comments
Date Tested: 9.5.11

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65703

Sample Source: TP57 0.4m to 0.7m

Sample Description: SILTY CLAY: dark brown, high plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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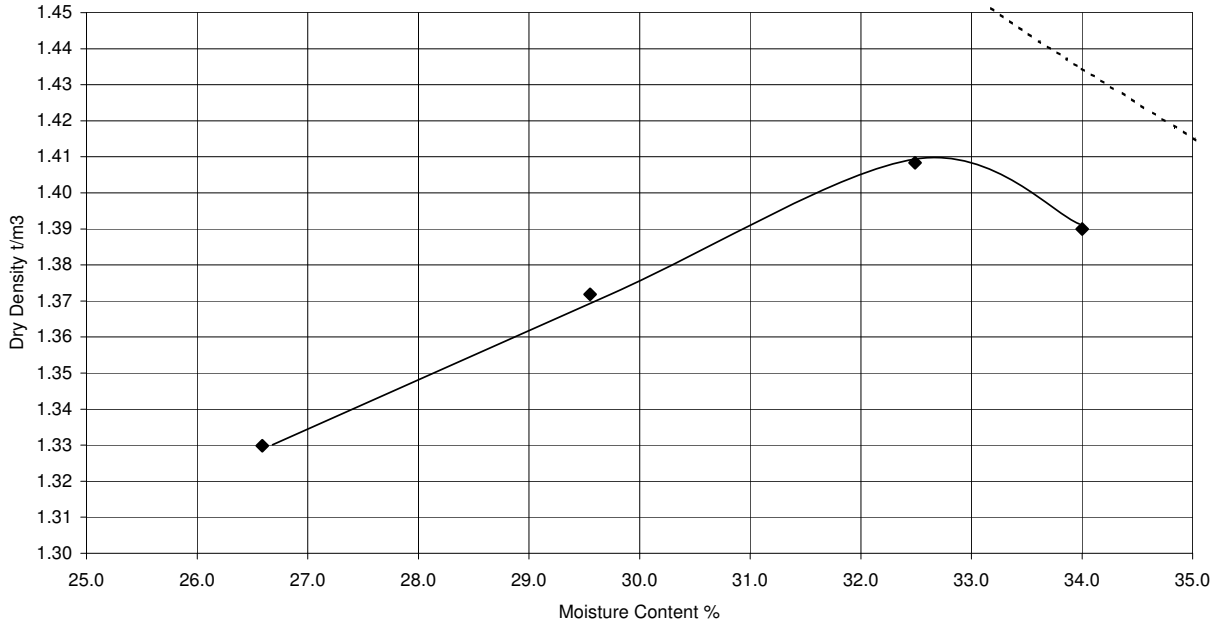
DRY DENSITY/MOISTURE CONTENT RELATION

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)



Job Number:	119-253	
Laboratory Number:	65703	
Sample Source:	TP57 0.4-0.7m	
Sample Description:	SILTY CLAY: dark brown, high plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.	
Maximum Dry Density:	1.41	t/m^3
Optimum Moisture Content:	32.5	%
Oversize Material:	19	mm
% Oversize:	1	%
Date Tested:	03.05.11	
Sampled By:	Client	
Compactive Effort:	Standard	
Test Method:	**AS 1289 5.1.1**	
Mould Type:	A	
Number of Layers:	3	
Blows per Layer:	25	
Mass of Rammer:	2.7	kg
Drop of Rammer:	300	mm
Zero Air Voids Line - Particle Density:	2.80	t/m^3
Comments:		

Approved Signatory: Chris Lloyd Date: 10.5.11

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CALIFORNIA BEARING RATIO

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

Sample Source:	TP57 0.4-0.7m	
Sample Description:	SILTY CLAY: dark brown, high plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.	
Job Number:	119-253	
Laboratory Number:	65703	
CBR Value @ 2.5mm	4.0	(%)
CBR Value @ 5.0mm	4.0	(%)
Sample Data		
Compaction Specification	95% of MDD at OMC	
Maximum Dry Density (MDD)	1.41	(t/m^3)
Optimum Moisture Content (OMC)	32.5	(%)
Mass of Surchages	4.5	(kg)
Number of Days Soaked	4	
Sample Preparation		
Dry Density - Before Soaking	1.34	(t/m^3)
Dry Density - After Soaking	1.31	(t/m^3)
Retained on 19mm Sieve	1% excluded	(%)
Moisture Content - Before Soaking	32.4	(%)
Laboratory Density Ratio	95.0	(%)
Laboratory Moisture Ratio	100.0	(%)
Moisture Content - After Soaking		
Top 30mm of Test Sample	40.9	(%)
Remainder of Test Sample	35.7	(%)
Swell After Soaking	1.8	(%)
Compactive Effort	Standard	
Number of Layers	3	
Blows per Layer	50	
Mass of Rammer	2.7	(kg)
Drop of Rammer	300	(mm)
Comments		
Date Tested:	9.5.11	

Tested in accordance with AS1289.6.1.1 Determination of the California Bearing Ratio of a soil Standard Laboratory Method for a remoulded specimen.

Approved Signatory: Chris Lloyd Date: 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65704

Sample Source: TP12 1.6m to 1.7m

Sample Description: SILTY GRAVELLY SAND: yellow-brown, fine to coarse sand, fine to medium gravel, low plasticity.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65705

Sample Source: TP16 1.1m to 1.2m

Sample Description: SILTY CLAY: brown, high plasticity, trace of fine to coarse sand, with fine to medium gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65706

Sample Source: TP22 1.4m to 1.5m

Sample Description: SILTY CLAY: yellow-brown, medium plasticity, trace of fine to coarse sand and fine to coarse gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	
Class 6 no dispersion	X

EMERSION CLASS NO.: 6

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65707

Sample Source: BH24 1.2 to 1.3m

Sample Description: CLAYEY SAND: dark-brown, fine to coarse sand, low plasticity, trace of fine gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 03.08.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65708

Sample Source: TP28 1.1m to 1.2m

Sample Description: SILTY CLAY: red-brown, high plasticity, trace of fine to coarse sand and fine gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	
Class 6 no dispersion	X

EMERSION CLASS NO.: 6

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65709

Sample Source: TP34 1.4m to 1.5m

Sample Description: SILTY CLAY: grey-brown/ brown, high plasticity, trace of fine to coarse sand and fine gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	X
Does not disperse	

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	

5. VIGOROUS SHAKING

Class 5 disperses	
Class 6 no dispersion	

EMERSION CLASS NO.: 3

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65710

Sample Source: TP38 1.3m to 1.4m

Sample Description: SANDY SILT: red-brown, low plasticity, fine to medium sand.

1. IMMERSION

Does not slake	→	Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	
Class 6 no dispersion	X

EMERSION CLASS NO.: 6

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65711

Sample Source: TP42 1.2m to 1.3m

Sample Description: SILTY CLAY: dark red-brown, high plasticity, trace of fine to coarse sand, trace of fine to coarse gravel.

1. IMMERSION

Does not slake	→	Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

This document is issued in accordance with NATA's accreditation requirements

Accreditation No. 1459

TEST CERTIFICATE

SGS Australia Pty Ltd
Unit 15, 33 Maddox Street
(PO Box 6432)
Alexandria NSW 2015
Australia

ABN 44 000 964 278
ph: +61 (0)2 8594 0481
fax: +61 (0)2 8594 0499

EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65712

Sample Source: TP50 1.5m to 1.6m

Sample Description: SILTYCLAY: brown, high plasticity, trace of fine to medium sand.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	X
Class 6 no dispersion	

EMERSION CLASS NO.: 5

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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EMERSON CRUMB TEST

CLIENT: URS Australia Pty Ltd
Level 4, 407 Pacific Highway Artarmon NSW 2064
PROJECT: Paling Yards Wind Farm Project (43167888)

Laboratory Number: 65713

Sample Source: TP60 1.5m to 1.6m

Sample Description: SILTYCLAY: brown, high plasticity, trace of fine to coarse sand, trace of fine gravel.

1. IMMERSION

Does not slake →		Class 7 swells (Organic Soils)	
Slakes	X	Class 8 does not swell (Laterised)	

2. COMPLETE DISPERSION

Class 1 complete	
Class 2 partial	
No Dispersion	X

3. REMOULDING

Class 3 disperses	
Does not disperse	X

4. CARBONATE & GYPSUM (Acid Indicator)

Class 4 present	
Absent	X

5. VIGOROUS SHAKING

Class 5 disperses	
Class 6 no dispersion	X

EMERSION CLASS NO.: 6

Water used:	Distilled water at 20°C	Date Tested:	3.05.11
Tested By:	AB	Sampled By:	Client
Test Procedure:	AS 1289 3.8.1	Job Number:	119-253

Approved Signatory: Chris Lloyd **Date:** 10.5.11

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SOIL CLASSIFICATION TEST DATA

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

LAB NO.	SAMPLE SOURCE	SAMPLE DESCRIPTION	MOISTURE CONTENT (%) 1	DRY DENSITY (t/m^3)	LIQUID LIMIT 2	PLASTIC INDEX 3	PREPAR-ATION & HISTORY 4	LINEAR SHRINK. (%) 5
65694	TP08 0.4m to 0.7m	SILTY CLAY: light brown, high plasticity, plasticity, with fine to coarse gravel, trace trace of fine to coarse sand.	26.1	-	-	-	-	-
65695	TP17 0.4m to 0.7m	SILTY CLAY: red-brown, high plasticity, plasticity, trace of fine to coarse sand and fine to coarse gravel.	32.6	-	-	-	-	-
65696	TP21 0.4m to 0.7m	SILTY CLAY: red-brown, high plasticity, plasticity, trace of fine to coarse sand and fine to coarse gravel.	32.6	-	-	-	-	-
65697	TP25 0.5m to 0.8m	SILTY CLAY: dark red-brown, medium plasticity, trace of fine to coarse sand and fine to coarse grav.	19.6	-	-	-	-	-
65698	TP30 0.5m to 0.8m	SILTY CLAY: red-brown, medium plasticity, trace of fine to coarse sand and fine to coarse gravel.	16.1	-	-	-	-	-
65699	TP33 0.4m to 0.7m	CLAYEY SANDY GRAVEL: brown, fine to coarse gravel, fine to coarse sand, low plasticity.	19.7	-	-	-	-	-
65700	TP39 0.4m to 0.7m	SILTY CLAY: red-brown, medium plasticity, trace of fine to coarse sand and fine to coarse gravel.	14.4	-	-	-	-	-
65701	TP48 0.4m to 0.7m	SANDY GRAVELLY CLAY: yellow-brown, medium plasticity, fine to coarse gravel, fine to coarse sand.	17.6	-	-	-	-	-

NOTES TO TESTING

Test Method: AS 1289 2.1.1

Sampled By: Client

Job Number: 119-253

Date Tested: 3.5.11

Approved Signatory: Chris Lloyd Date: 10.5.11

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SOIL CLASSIFICATION TEST DATA

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

LAB NO.	SAMPLE SOURCE	SAMPLE DESCRIPTION	MOISTURE CONTENT (%) 1	DRY DENSITY (t/m^3)	LIQUID LIMIT 2	PLASTIC INDEX 3	PREPAR-ATION & HISTORY 4	LINEAR SHRINK. (%) 5
65702	TP53 0.4m to 0.7m	GRAVELLY CLAY: dark-brown, medium plasticity, fine to coarse gravel, trace of fine to coarse sand.	24.2	-	-	-	-	-
65703	TP57 0.4m to 0.7m	SILTY CLAY: dark-brown, high plasticity, trace of fine to coarse sand and fine to coarse gravel.	28.5	-	-	-	-	-
65704	TP12 1.6m to 1.7m	SILTY GRAVELLY SAND: yellow-brown, fine to coarse sand, fine to medium gravel, low plasticity.	26.8	-	-	-	-	-
65705	TP16 1.1m to 1.2m	SILTY CLAY: brown, high plasticity, trace of fine to coarse sand, with fine to medium gravel.	32.5	-	-	-	-	-
65706	TP22 1.4m - 1.5m	SILTY CLAY: yellow-brown, medium plasticity, trace of fine to coarse sand and fine to coarse gravel.	22.7	-	-	-	-	-
65707	TP24 1.2m to 1.3m	CLAYEY SAND: dark-brown, fine to coarse sand, low plasticity, trace of fine gravel.	17.8	-	-	-	-	-
65708	TP28 1.1m to 1.2m	SILTY CLAY: red-brown, high plasticity, trace of fine to coarse sand and fine gravel.	28.0	-	-	-	-	-
65709	TP34 1.4m to 1.5m	SILTY CLAY: grey-brown/ brown, high plasticity, trace of fine to coarse sand and fine gravel.	40.0	-	-	-	-	-

NOTES TO TESTING

Test Method: AS 1289 2.1.1

Sampled By: Client

Job Number: 119-253

Date Tested: 3.5.11

Approved Signatory: Chris Lloyd Date: 10.5.11

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SOIL CLASSIFICATION TEST DATA

CLIENT: **URS Australia Pty Ltd**
Level 4, 407 Pacific Highway Artarmon NSW 2064

PROJECT: **Paling Yards Wind Farm Project (43167888)**

LAB NO.	SAMPLE SOURCE	SAMPLE DESCRIPTION	MOISTURE CONTENT (%) 1	DRY DENSITY (t/m^3)	LIQUID LIMIT 2	PLASTIC INDEX 3	PREPAR-ATION & HISTORY 4	LINEAR SHRINK. (%) 5
65710	TP38 1.3m to 1.4m	SANDY SILT: red-brown, low plasticity, fine to medium sand.	31.8	-	-	-	-	-
65711	TP42 1.2m to 1.3m	SILTY CLAY: dark red-brown, high plasticity, trace of fine to coarse sand, trace of fine gravel.	26.1	-	-	-	-	-
65712	TP50 1.5m to 1.6m	SILTY CLAY: brown, high plasticity, trace of fine to medium sand.	35.9	-	-	-	-	-
65713	TP60 1.5m to 1.6m	SILTY CLAY: brown, high plasticity, trace of fine to coarse sand, trace of fine gravel.	20.7	-	-	-	-	-

NOTES TO TESTING

Test Method: AS 1289 2.1.1

Sampled By: Client

Job Number: 119-253

Date Tested: 3.5.11

Approved Signatory: Chris Lloyd Date: 10.5.11

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Accreditation No. 1459

Head Office:
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KEYSBOROUGH VIC 3173

CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103299**
Project:	Paling Yards Wind Farm	Date:	11/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **8** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

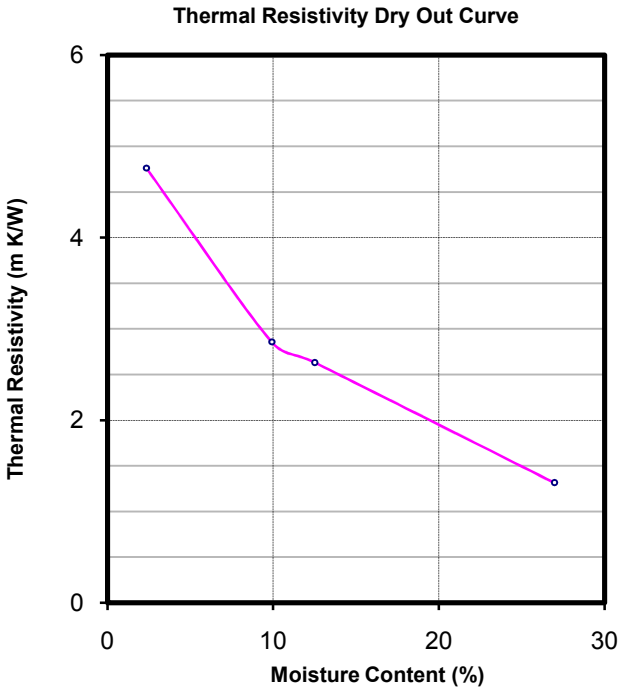
Sample History: **100% Standard Effort @ as recieved Moisture Content**

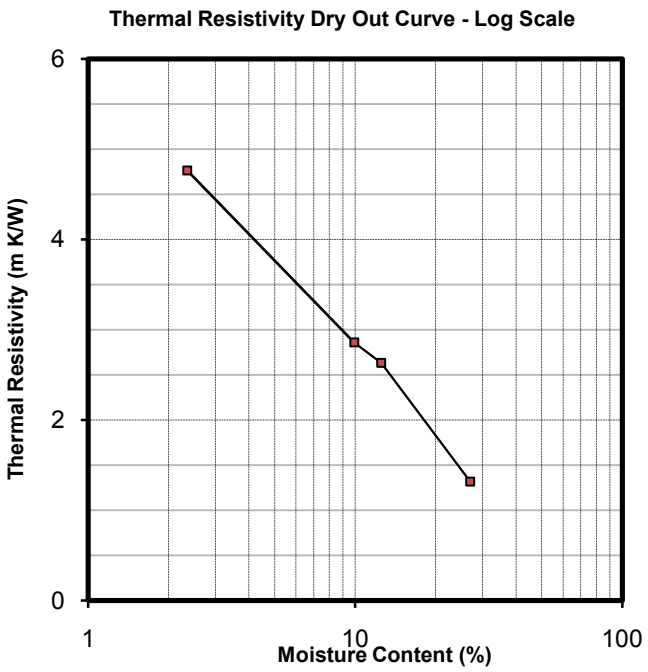
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
2.3	---	0.21	4.76
9.9	---	0.35	2.86
12.5	---	0.38	2.63
27.0	1.582	0.76	1.32





Remarks:

Tested by : AC/KK Date : 5 - 10-Aug-11 Checked by : AC Date: 11-Aug-11

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CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103338**
Project:	Paling Yards Wind Farm	Date:	15/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **15** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

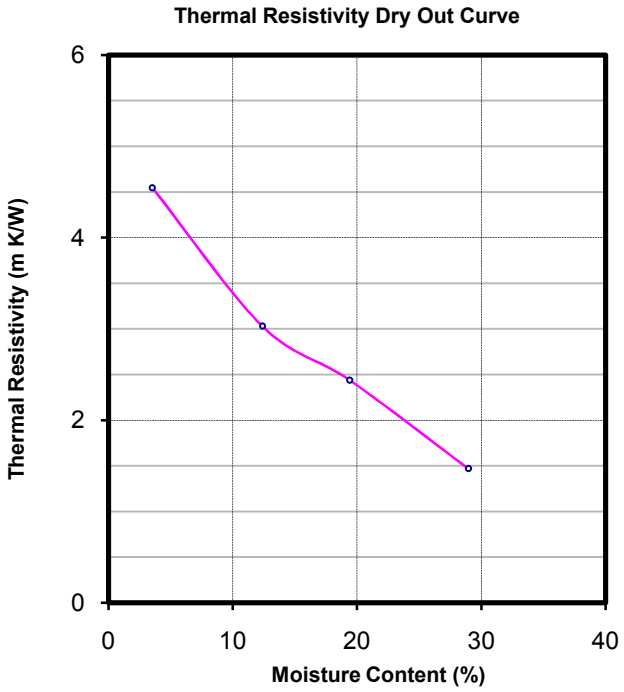
Sample History: **100% Standard Effort @ as recieved Moisture Content**

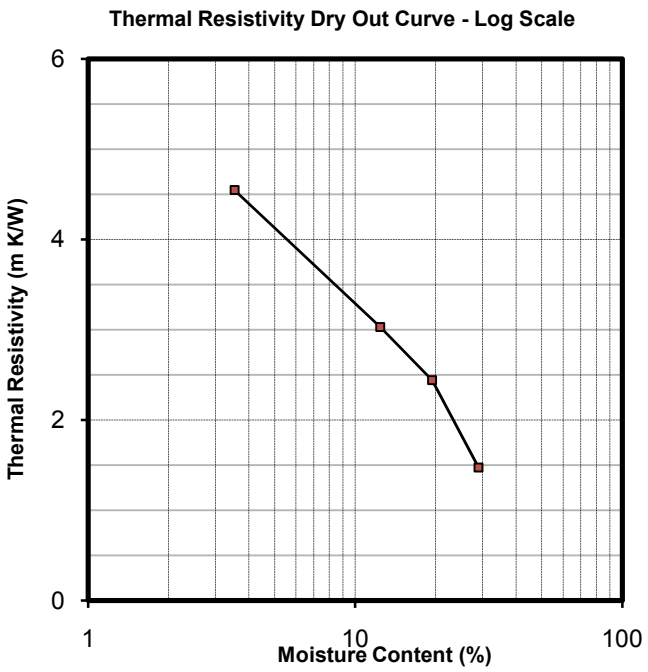
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
3.5	---	0.22	4.55
12.4	---	0.33	3.03
19.4	---	0.41	2.44
29.0	1.546	0.68	1.47





Remarks:

Tested by : AC/KK Date : 8 - 15-Aug-11 Checked by : AC Date: 15-Aug-11

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CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103300**
Project:	Paling Yards Wind Farm	Date:	11/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **17** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

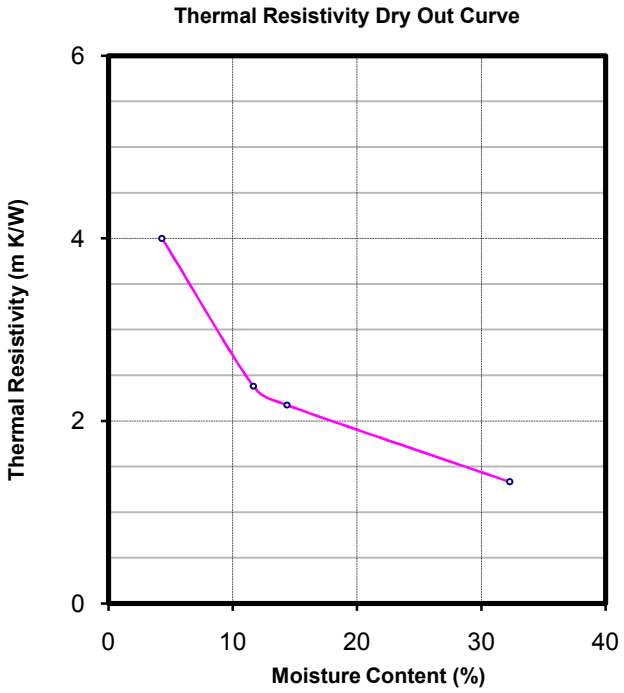
Sample History: **100% Standard Effort @ as recieved Moisture Content**

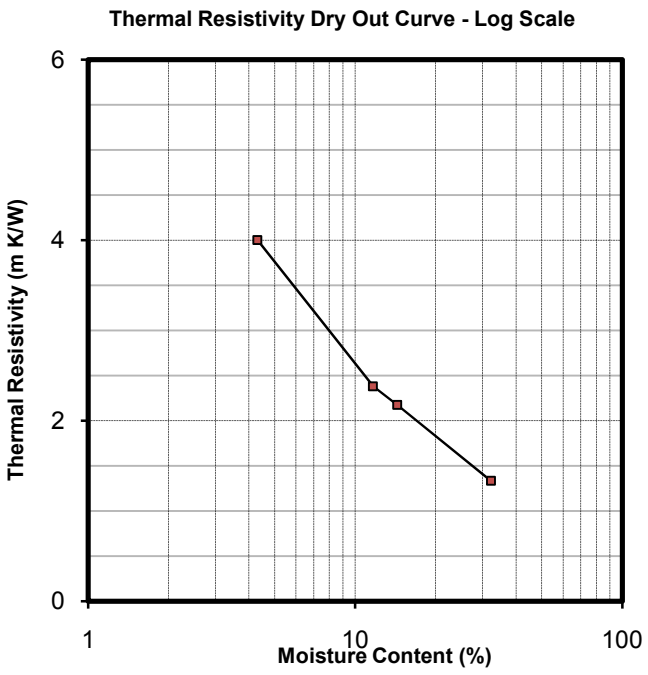
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
4.3	---	0.25	4.00
11.7	---	0.42	2.38
14.4	---	0.46	2.17
32.3	1.392	0.75	1.33





Remarks:

Tested by : AC/KK Date : 5 - 10-Aug-11 Checked by : AC Date: 11-Aug-11

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KEYSBOROUGH VIC 3173

CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103301**
Project:	Paling Yards Wind Farm	Date:	11/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **21** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

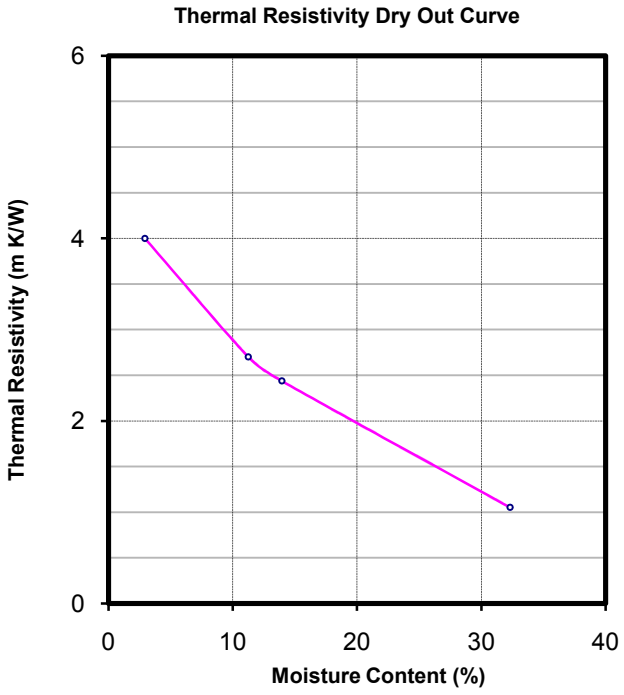
Sample History: **100% Standard Effort @ as recieved Moisture Content**

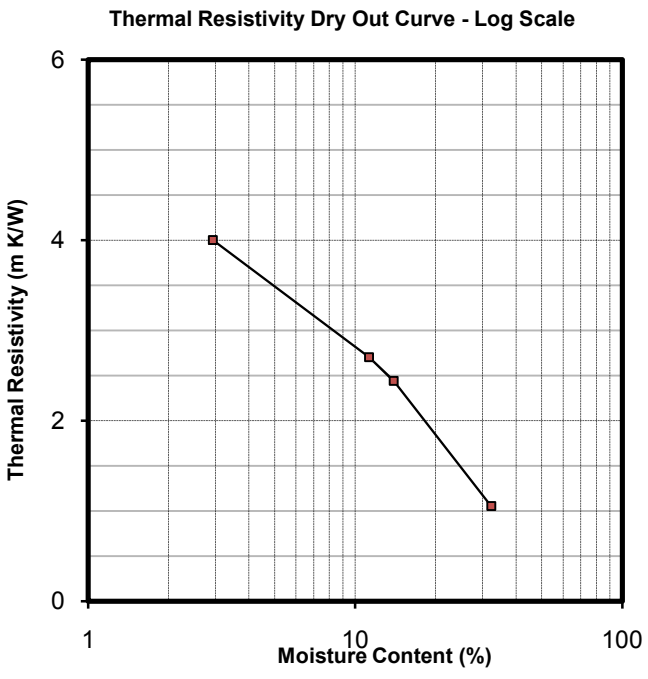
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
2.9	---	0.25	4.00
11.3	---	0.37	2.70
13.9	---	0.41	2.44
32.3	1.529	0.95	1.05





Remarks:

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CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103302**
Project:	Paling Yards Wind Farm	Date:	11/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **25** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

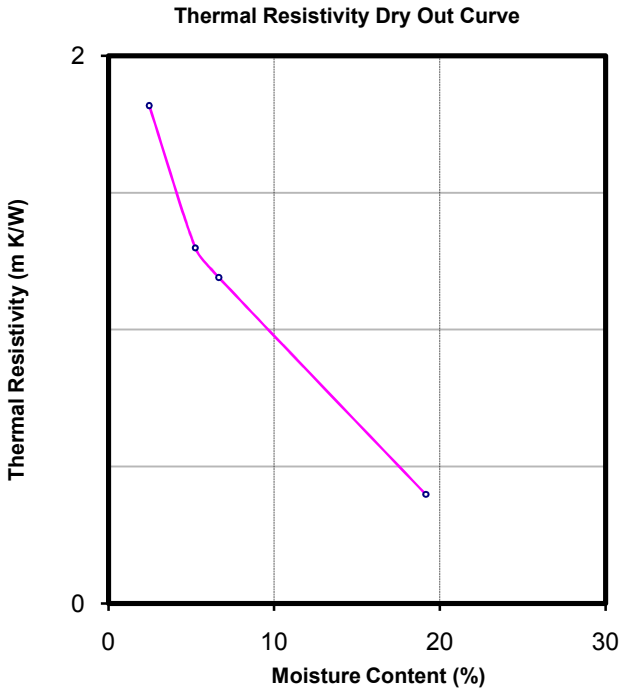
Sample History: **100% Standard Effort @ as recieved Moisture Content**

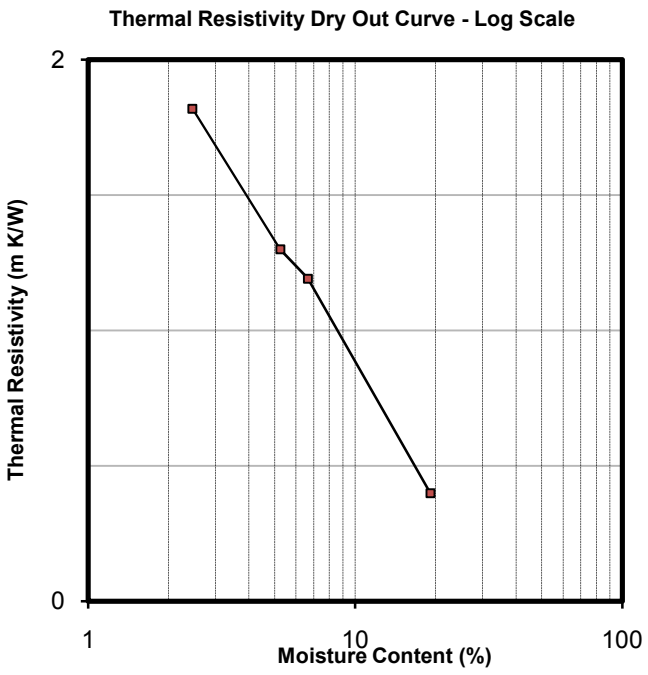
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
2.5	---	0.55	1.82
5.2	---	0.77	1.30
6.7	---	0.84	1.19
19.2	1.947	2.51	0.40





Remarks:

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CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103303**
Project:	Paling Yards Wind Farm	Date:	11/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **30** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

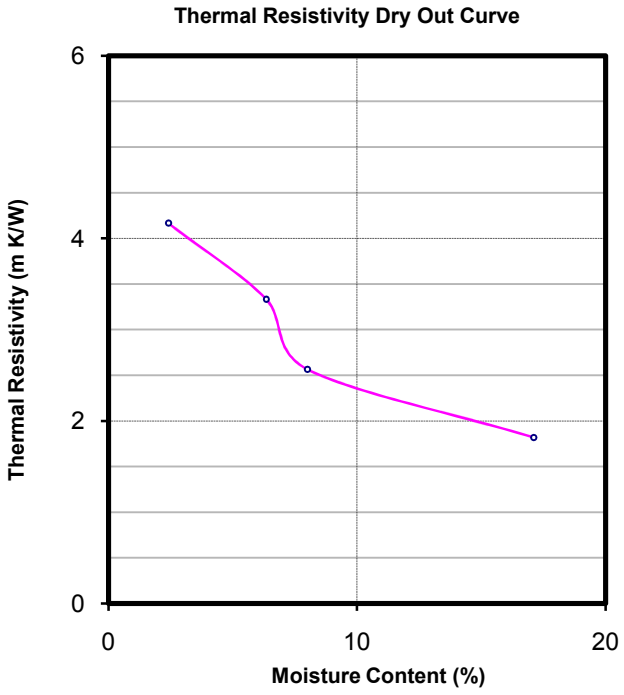
Sample History: **100% Standard Effort @ as recieved Moisture Content**

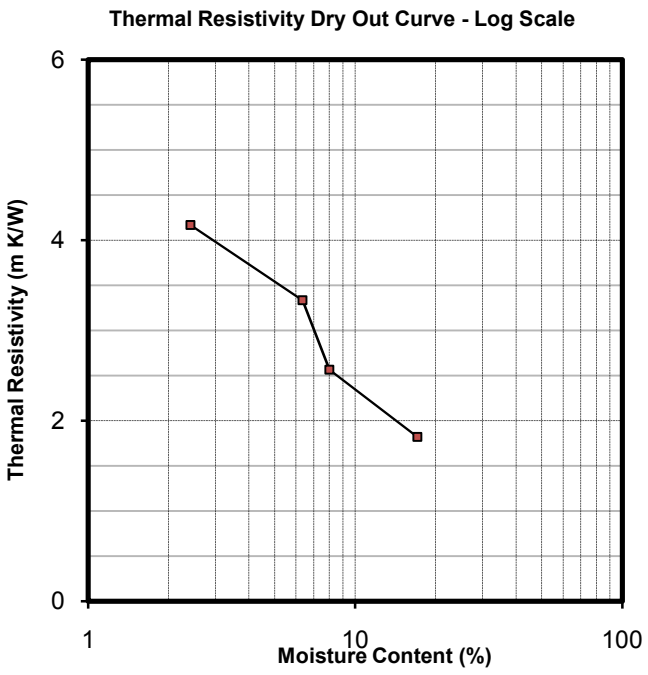
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
2.4	---	0.24	4.17
6.4	---	0.3	3.33
8.0	---	0.39	2.56
17.1	1.600	0.55	1.82





Remarks:

Tested by : AC/KK Date : 5 - 10-Aug-11 Checked by : AC Date: 11-Aug-11

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CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103305**
Project:	Paling Yards Wind Farm	Date:	11/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **39** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

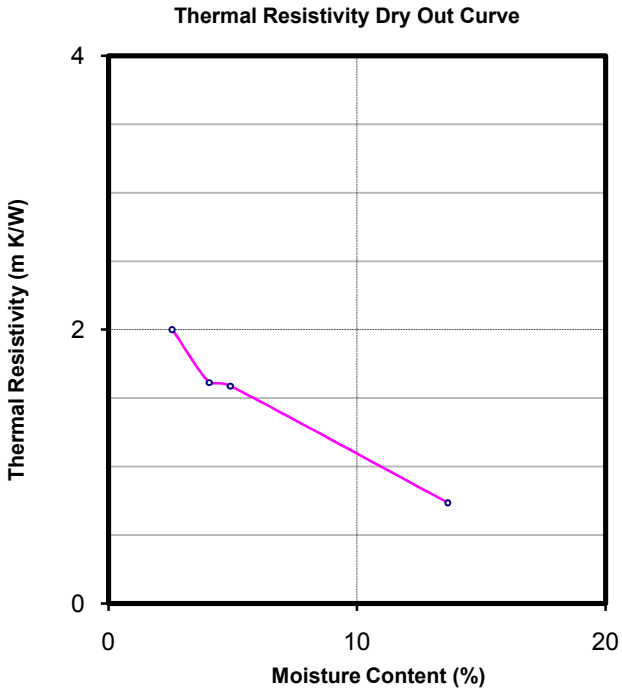
Sample History: **100% Standard Effort @ as recieved Moisture Content**

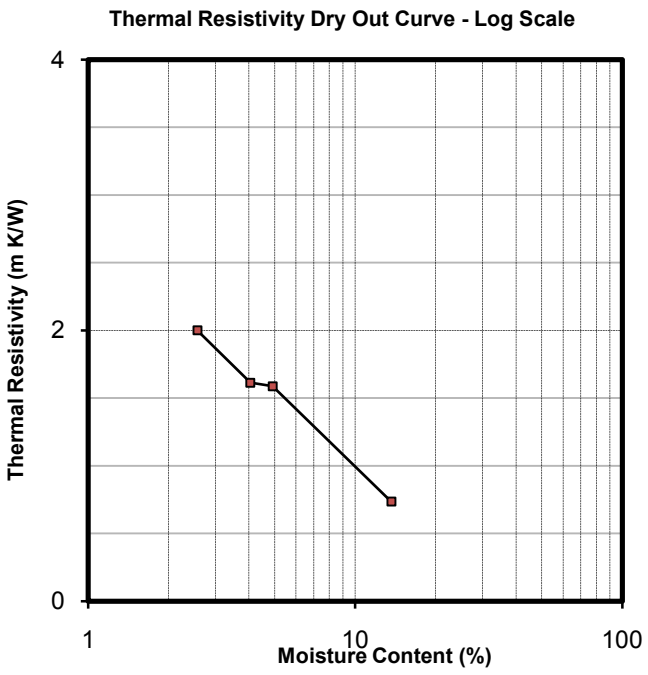
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
2.6	---	0.5	2.00
4.1	---	0.62	1.61
4.9	---	0.63	1.59
13.7	1.820	1.36	0.74





Remarks:

Tested by : AC/KK Date : 5 - 10-Aug-11 Checked by : AC Date: 11-Aug-11

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CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103339**
Project:	Paling Yards Wind Farm	Date:	15/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **41** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

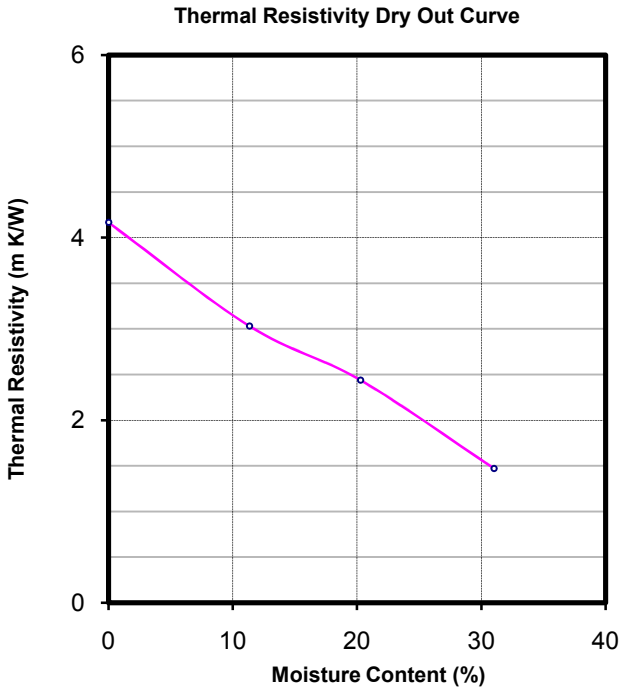
Sample History: **100% Standard Effort @ as recieved Moisture Content**

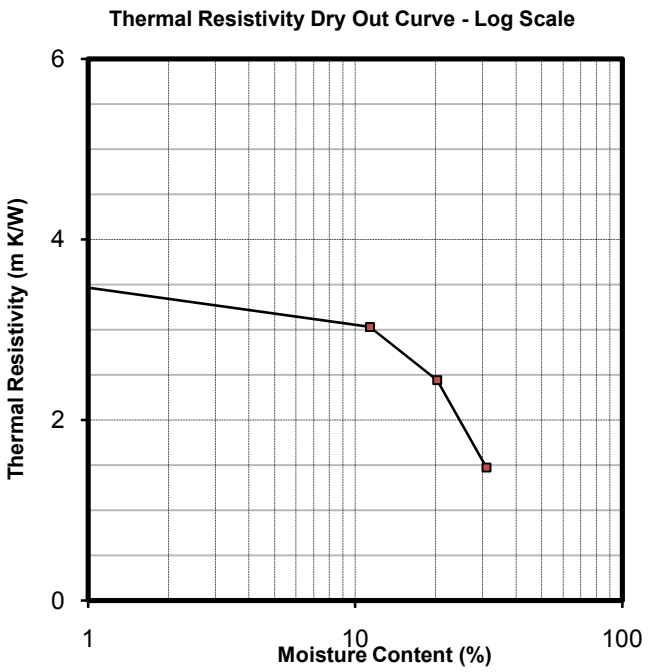
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
0.0	---	0.24	4.17
11.4	---	0.33	3.03
20.3	---	0.41	2.44
31.0	1.642	0.68	1.47





Remarks:

Tested by : AC/KK Date : 8 - 15-Aug-11 Checked by : AC Date: 15-Aug-11

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CHADWICK GEOTECHNICS

Thermal Resistivity Dryout Curve Reports

Job No.:	306540	**Sample No.:**	**1103308**
Project:	Paling Yards Wind Farm	Date:	11/08/11
Client:	URS Australia Pty Ltd		

Test Pit No: **57** **Depth:** **0.50 - 0.80m**

Test Method Used : Reference Doc. IEEE Guide for Soil Resistivity Measurements. (IEEE Std 442 - 1981)

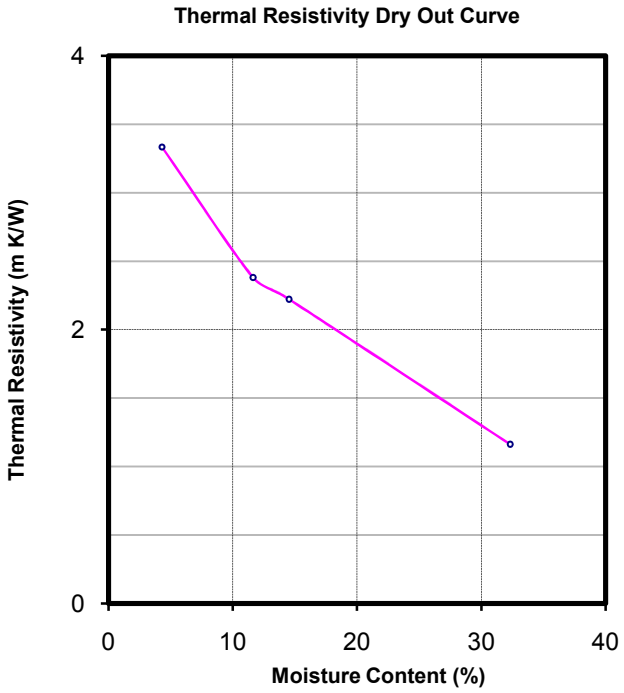
Sample History: **100% Standard Effort @ as recieved Moisture Content**

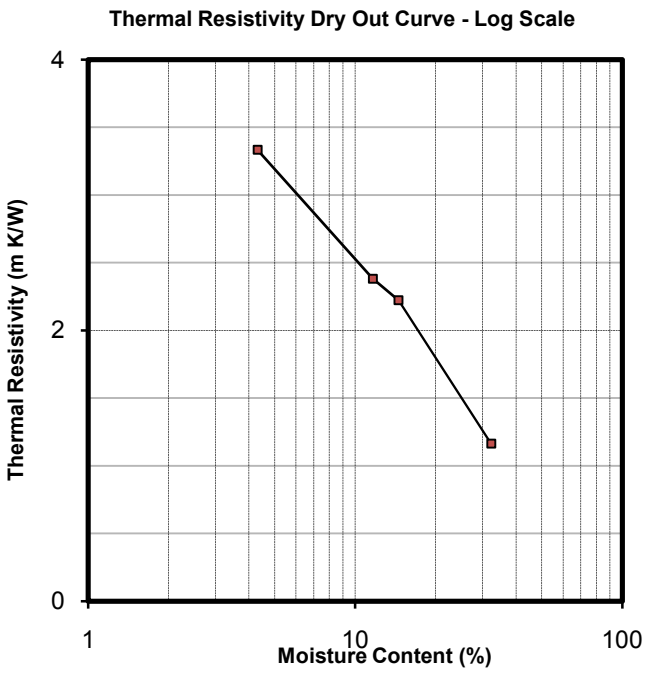
Resistivity Meter: **TC1396** Needle ID.: **0239** Needle Resistance: **82.93 Ohm/m:**

Sample Description: **Clay**

TEST RESULTS

Moisture Content (%)	Compacted Wet Density t/m^3	Thermal Conductivity (W / m K)	Thermal Resistivity (m K / W)
4.3	---	0.3	3.33
11.6	---	0.42	2.38
14.5	---	0.45	2.22
32.3	1.596	0.86	1.16



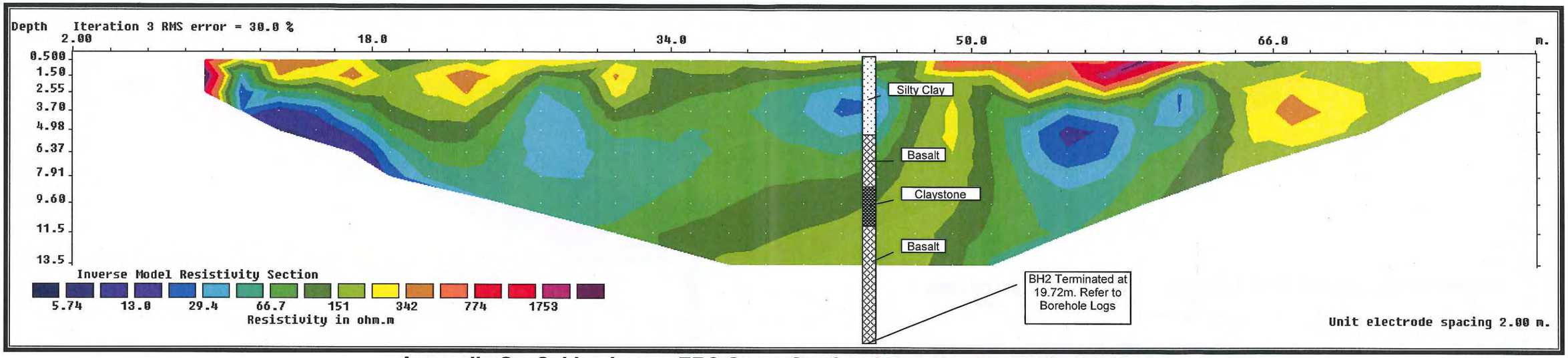


Remarks:

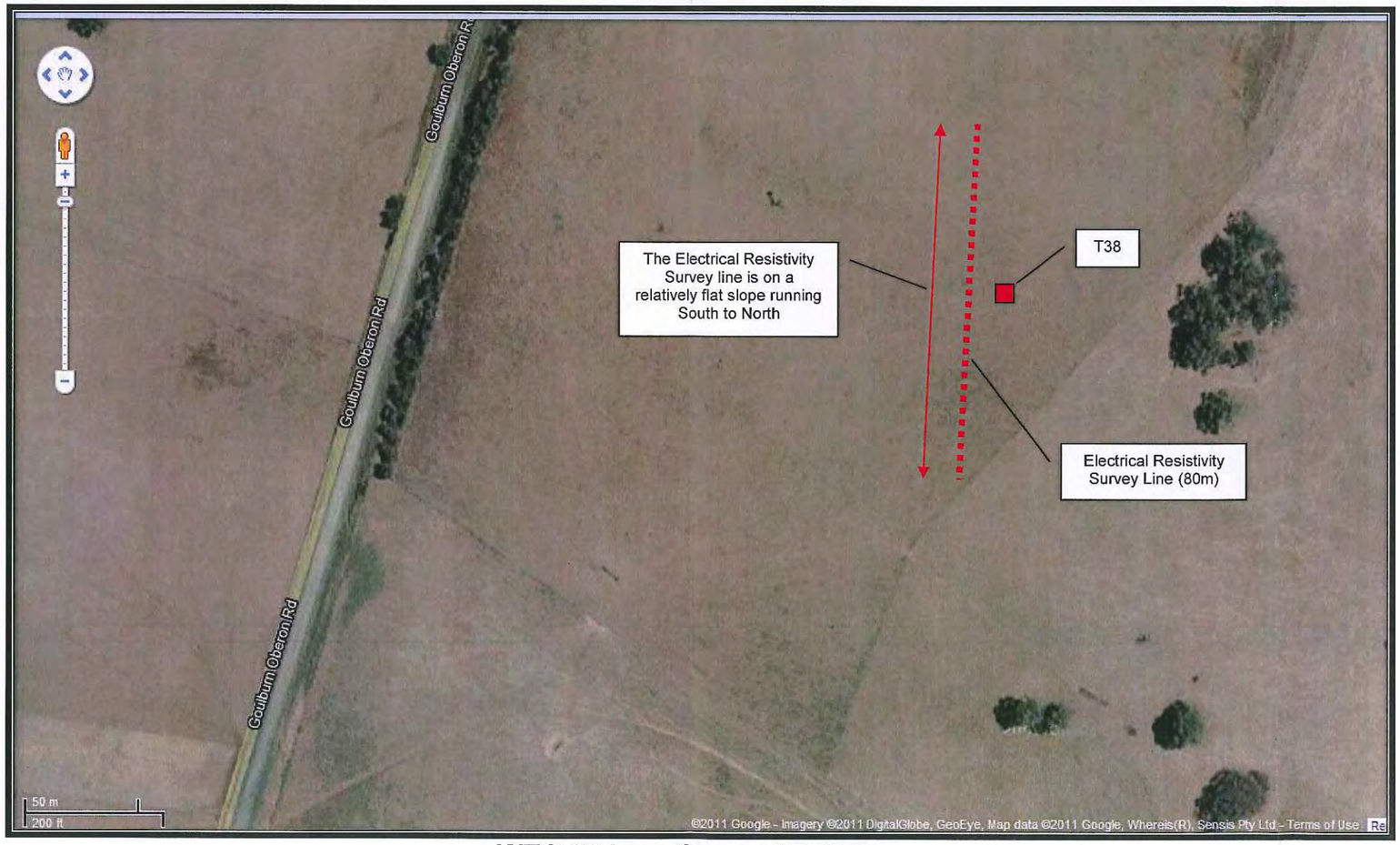
Tested by : AC/KK Date : 5 - 10-Aug-11 Checked by : AC Date: 11-Aug-11

G

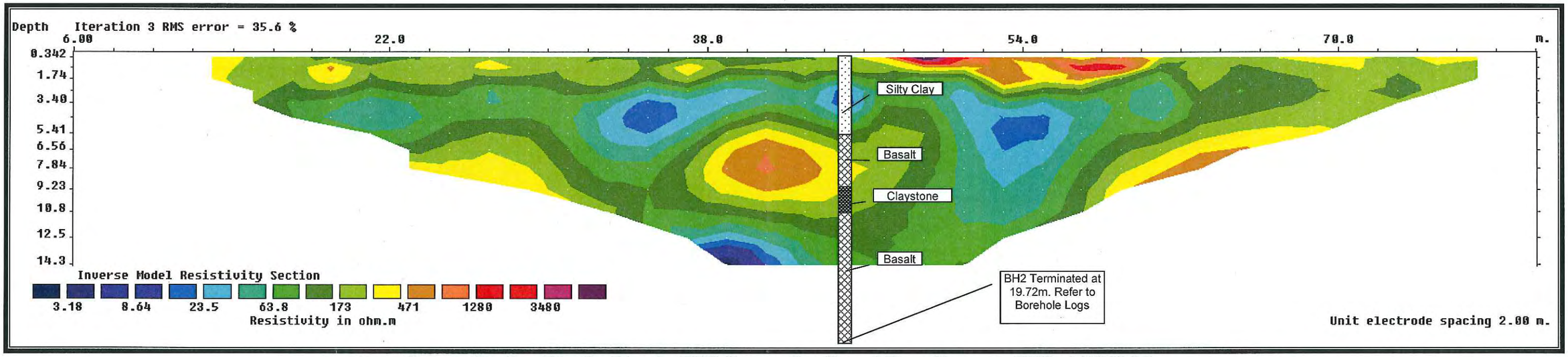
Appendix G Electrical Resistivity Results



Appendix G – Schlumberger ERS Cross-Sectional Results near BH2 at WTG38

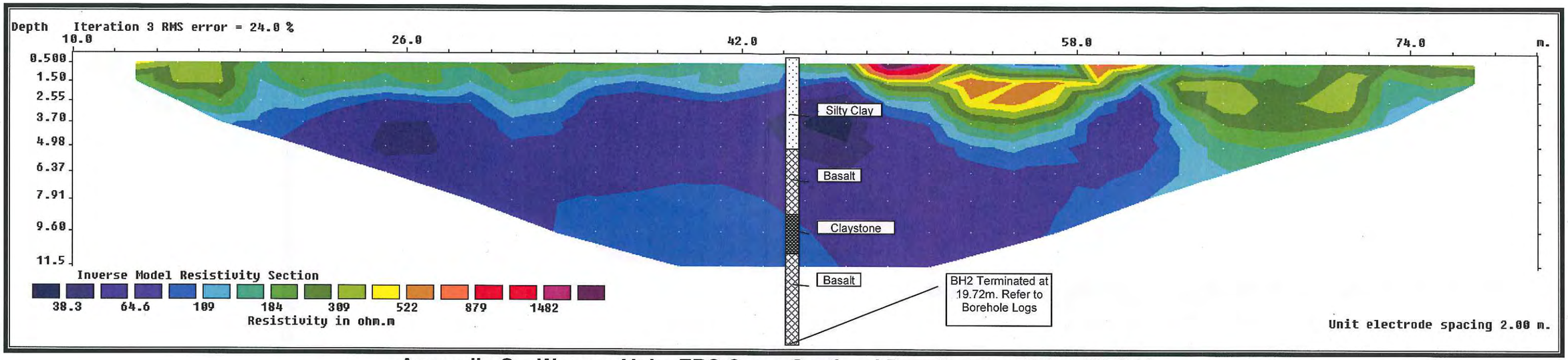


WTG 38 Location and ERS line

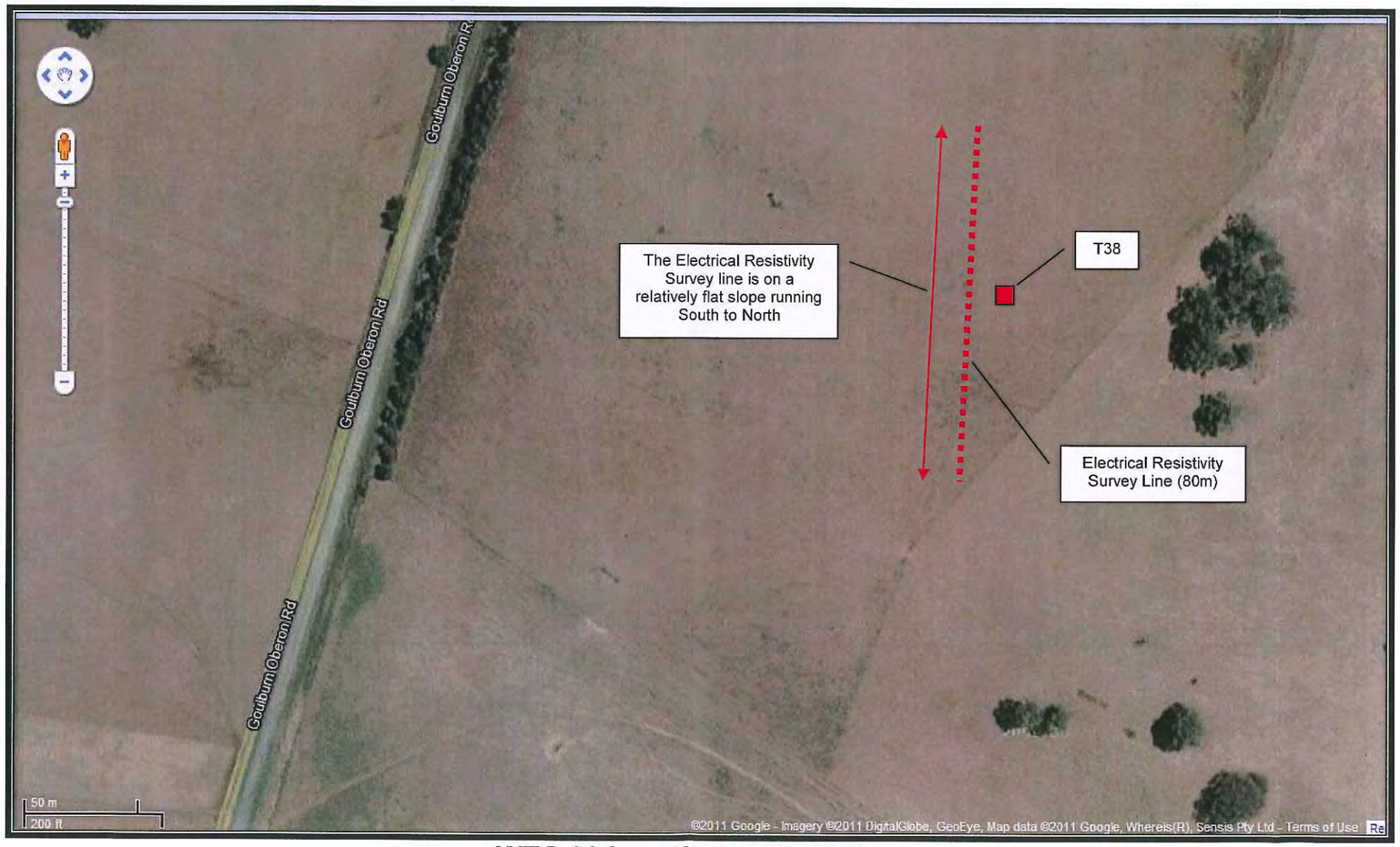


Appendix G – Dipole-Dipole ERS Cross-Sectional Results near BH2 at WTG38

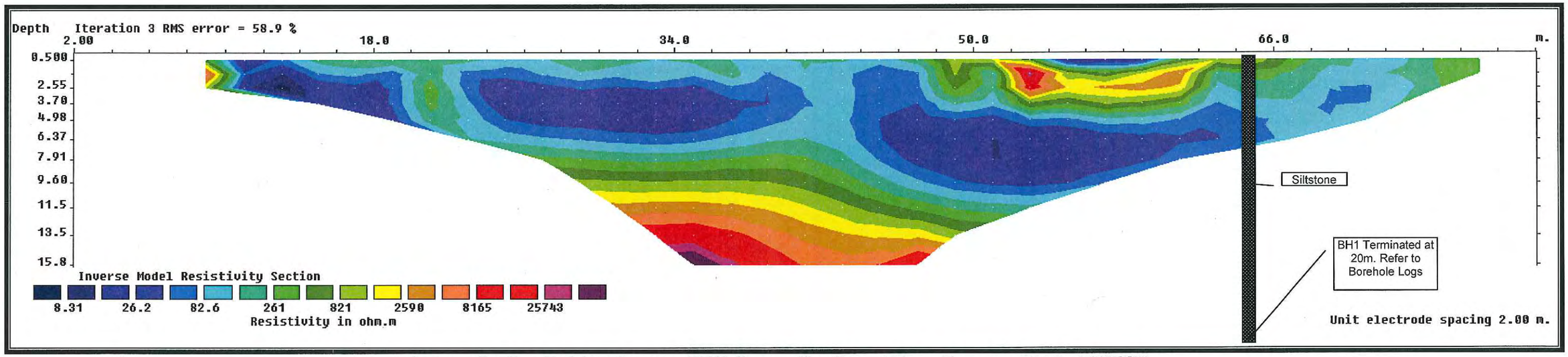
WTG 38 Location and ERS line



Appendix G – Wenner Alpha ERS Cross-Sectional Results near BH2 at WTG38

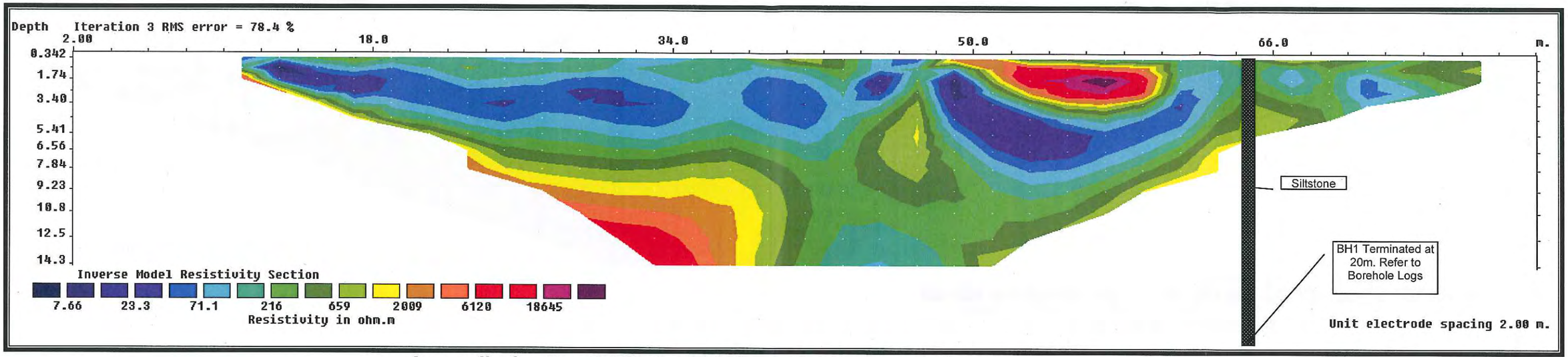


WTG 38 Location and ERS line



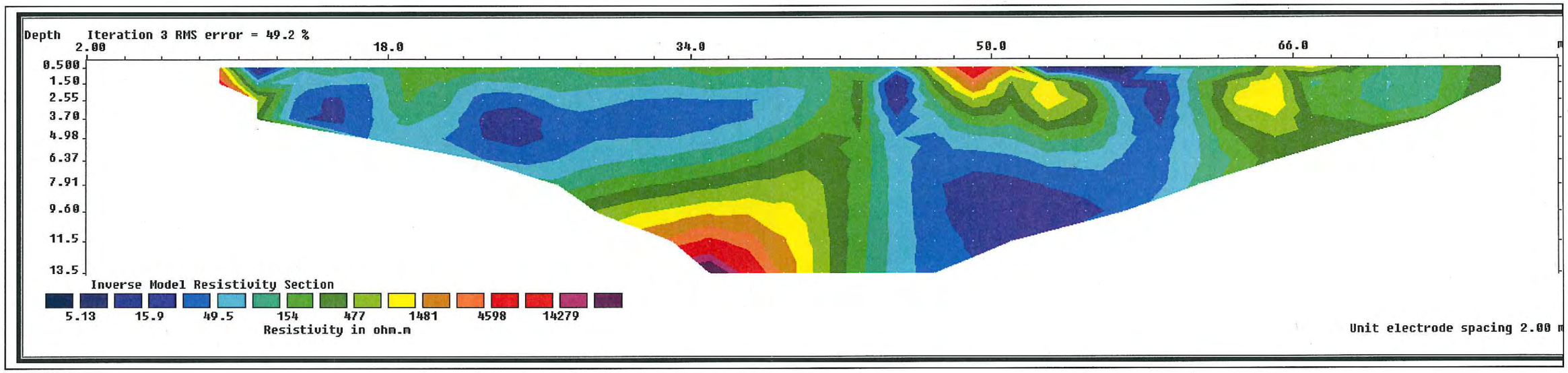
Appendix G – Schlumberger ERS Cross-Sectional Results near BH1 at WTG9

WTG 9 Location and ERS line



Appendix G – Dipole-Dipole ERS Cross-Sectional Results near BH1 at WTG9

WTG 9 Location and ERS line



Appendix G – Wenner Alpha ERS Cross-Sectional Results near BH1 at WTG9

WTG 9 Location and ERS line

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