



Photo 30 - Looking west at grass covered disturbed ground surface and a disused garden shed in the central western portion of Zone 2(B). Note the grass covered bricks and concrete.



Photo 31 - Disturbed ground surface near the shed indicated in Photo 30. Note the fragments of fibre cement on the ground



Photo 32 - Looking northeast at slabs of concrete in the northeast corner of Zone 2(B)



Photo 33 – Panoramic view looking south across Zone 2(B)



Photo 34 - Panoramic looking north across Zone 2(B)

Zone 2(D) – Observations



Photo 35A - Concrete, bricks, tree cuttings and fill mounds



Photo 35B - Piles of concrete and fill mound



Photo 36A - Looking east across the disturbed and eroded ground surface in Zone 2(D). Note poorly formed dam holding some water



Photo 36B - Steep Slopes >15° over western end of Zone 2(D).



Photo 36C - View of Zone 2(D) looking west.



Photo 36D - Loose Latite Cobbles and Boulders on Surface of Steep Slopes at Western End of Zone 2(D). Note irregular surface due to erosion or previous landslide.



Photo 36E - Erosion and slope instability over steep hillside Zone 2(D).



Photo 36F - Instability on Slope along high side of Access Track Zone 2(D). Note shallow depth to rock at this location.



Photo 36G – Irregular disturbed ground surface over lower sideslopes. Note Dam on left of picture holding water, Zone 2(D), trees at top of picture are at western end of Zone 2(D).

Zone 3(A) – Observations



Photo 37A - East to west panoramic view across the northern portion of Zone 3(A) i.e. Ash Pond 3. Note the elevated accessway, with coalwash at the surface



Photo 37B – Looking southeast towards Ash Pond 3 and an excavated drainage channel.



Photo 37C – Outcropping rock observed on the western side of the drainage channel.
Noted in Photo 37B, Zone 3(A)



Photo 38 - Ground surface of Zone 3(A) note coalwash cover

Zone 3(B) – Observations



Photo 39 – Panoramic view from southwest to northwest across Zone 3(B).

Zone 4(A) – Observations



Photo 40 – Panoramic view across Zone 4(A) from the southeast corner. Note large area of ponded water



Photo 41 - Looking south from the northern side of Zone 4(B) (D).



Photo 42 – Concrete Reservoir in the central portion of the Zone. Note the southern side (right-hand side) is cut into the Budgong Sandstone while the northern side lies over of fill



Photo 43 - Concrete slabs in fill soils located on the northern side of the reservoir as indicated in Photo 42



Photo 44 - Looking west at the access roadway and telecommunications tower located in the western portion of Zone 4(B) (D). Note the recycled road base fill on the surface of the access roadway.



Photo 45 - Grass covered fill mounds in the central northern portion of the Zone, located approximately 100m southwest of the steel/concrete bridge



Photo 47 - Grass covered stockpile of soil material in the background of the photograph located in the western portion of the Zone.



Photo 46 - Grass covered fill mounds in the central northern portion of Zone 4(C), located approximately 100m southeast of the steel/concrete bridge

Appendix D

Borehole, Test Pit and Monitoring Well Logs with Explanation Sheets

Geotechnical, Contamination and Groundwater Investigation,
Tallawarra Lands, Yallah, NSW

- D-1 Test Pit Logs
- D-2 Borehole Logs
- D-3 Monitoring Well Logs

Soil Description Explanation Sheet (1 of 2)

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 μ m to 2.36 mm
	medium	200 μ m to 600 μ m
	fine	75 μ m to 200 μ m

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH S_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	-	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely weathered material Structure and fabric of parent rock visible.

Residual soil Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil Deposited by wind.

Alluvial soil Deposited by streams and rivers.

Colluvial soil Deposited on slopes (transported downslope by gravity).

Fill Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.

Lacustrine soil Deposited by lakes.

Marine soil Deposited in ocean basins, bays, beaches and estuaries.

Soil Description Explanation Sheet (2 of 2)

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)				USC	PRIMARY NAME	
COARSE GRAINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	GRAVELS More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.	GW	GRAVEL	
		GRAVELS WITH FINES (Appreciable amount of fines)	Predominantly one size or a range of sizes with more intermediate sizes missing.	GP	GRAVEL	
		CLEAN SANDS (Little or no fines)	Non-plastic fines (for identification procedures see ML below)	GM	SILTY GRAVEL	
			Plastic fines (for identification procedures see CL below)	GC	CLAYEY GRAVEL	
	SANDS More than half of coarse fraction is smaller than 2.36 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes	SW	SAND	
		SANDS WITH FINES (Appreciable amount of fines)	Predominantly one size or a range of sizes with some intermediate sizes missing.	SP	SAND	
		IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm.	DRY STRENGTH	DILATANCY	TOUGHNESS	
			None to Low	Quick to slow	None	ML
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm (A 0.075 mm particle is about the smallest particle visible to the naked eye)	SILTS & CLAYS Liquid limit less than 50	Medium to High	None	Medium	CL	CLAY
		Low to medium	Slow to very slow	Low	OL	ORGANIC SILT
		Low to medium	Slow to very slow	Low to medium	MH	SILT
	SILTS & CLAYS Liquid limit greater than 50	High	None	High	CH	CLAY
		Medium to High	None	Low to medium	OH	ORGANIC CLAY
		HIGHLY ORGANIC SOILS	Readily identified by colour, odour, spongy feel and frequently by fibrous texture.	Pt	PEAT	

• Low plasticity – Liquid Limit w_L less than 35%. • Medium plasticity – w_L between 35% and 50%. • High plasticity – w_L greater than 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM	TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.		SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.		TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.		TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.		INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

Rock Description Explanation Sheet (1 of 2)

The descriptive terms used by Coffey are given below. They are broadly consistent with Australian Standard AS1726-1993.

DEFINITIONS: Rock substance, defect and mass are defined as follows:

Rock Substance In engineering terms rock substance is any naturally occurring aggregate of minerals and organic material which cannot be disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms. Effectively homogenous material, may be isotropic or anisotropic.

Defect Discontinuity or break in the continuity of a substance or substances.

Mass Any body of material which is not effectively homogeneous. It can consist of two or more substances without defects, or one or more substances with one or more defects.

SUBSTANCE DESCRIPTIVE TERMS:

ROCK NAME Simple rock names are used rather than precise geological classification.

PARTICLE SIZE Grain size terms for sandstone are:
 Coarse grained Mainly 0.6mm to 2mm
 Medium grained Mainly 0.2mm to 0.6mm
 Fine grained Mainly 0.06mm (just visible) to 0.2mm

FABRIC Terms for layering of penetrative fabric (eg. bedding, cleavage etc.) are:

Massive No layering or penetrative fabric.

Indistinct Layering or fabric just visible. Little effect on properties.

Distinct Layering or fabric is easily visible. Rock breaks more easily parallel to layering of fabric.

CLASSIFICATION OF WEATHERING PRODUCTS

Term	Abbreviation	Definition
Residual Soil	RS	Soil derived from the weathering of rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
Extremely Weathered Material	XW	Material is weathered to such an extent that it has soil properties, ie, it either disintegrates or can be remoulded in water. Original rock fabric still visible.
Highly Weathered Rock	HW	Rock strength is changed by weathering. The whole of the rock substance is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Some minerals are decomposed to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of minerals in pores.
Moderately Weathered Rock	MW	The whole of the rock substance is discoloured, usually by iron staining or bleaching, to the extent that the colour of the fresh rock is no longer recognisable.
Slightly Weathered Rock	SW	Rock substance affected by weathering to the extent that partial staining or partial discolouration of the rock substance (usually by limonite) has taken place. The colour and texture of the fresh rock is recognisable; strength properties are essentially those of the fresh rock substance.
Fresh Rock	FR	Rock substance unaffected by weathering.

Notes on Weathering:

- AS1726 suggests the term "Distinctly Weathered" (DW) to cover the range of substance weathering conditions between XW and SW. For projects where it is not practical to delineate between HW and MW or it is judged that there is no advantage in making such a distinction. DW may be used with the definition given in AS1726.
- Where physical and chemical changes were caused by hot gasses and liquids associated with igneous rocks, the term "altered" may be substituted for "weathering" to give the abbreviations XA, HA, MA, SA and DA.

ROCK SUBSTANCE STRENGTH TERMS

Term	Abbreviation	Point Load Index, $I_{p(50)}$ (MPa)	Field Guide
Very Low	VL	Less than 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; pieces up to 30mm thick can be broken by finger pressure.
Low	L	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show with firm bows of a pick point; has a dull sound under hammer. Pieces of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium	M	0.3 to 1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High	H	1 to 3	A piece of core 150mm long by 50mm can not be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High	VH	3 to 10	Hand specimen breaks after more than one blow of a pick; rock rings under hammer.
Extremely High	EH	More than 10	Specimen requires many blows with geological pick to break; rock rings under hammer.

Notes on Rock Substance Strength:

- In anisotropic rocks the field guide to strength applies to the strength perpendicular to the anisotropy. High strength anisotropic rocks may break readily parallel to the planar anisotropy.
- The term "extremely low" is not used as a rock substance strength term. While the term is used in AS1726-1993, the field guide therein makes it clear that materials in that strength range are soils in engineering terms.
- The unconfined compressive strength for isotropic rocks (and anisotropic rocks which fall across the planar anisotropy) is typically 10 to 25 times the point load index $I_p(50)$. The ratio may vary for different rock types. Lower strength rocks often have lower ratios than higher strength rocks.

Rock Description Explanation Sheet (2 of 2)

COMMON DEFECTS IN ROCK MASSES		Diagram	Map Symbol	Graphic Log (Note 1)	DEFECT SHAPE	TERMS
Term	Definition				Planar	The defect does not vary in orientation
Parting	A surface or crack across which the rock has little or no tensile strength. Parallel or sub parallel to layering (eg bedding) or a planar anisotropy in the rock substance (eg, cleavage). May be open or closed.		20 		Curved	The defect has a gradual change in orientation
					Undulating	The defect has a wavy surface
					Stepped	The defect has one or more well defined steps
Joint	A surface or crack across which the rock has little or no tensile strength, but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance. May be open or closed.		60 		Irregular	The defect has many sharp changes of orientation
					Note: The assessment of defect shape is partly influenced by the scale of the observation.	
Sheared Zone (Note 3)	Zone of rock substance with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge shaped blocks.		35 		ROUGHNESS TERMS	
					Slickensided	Grooved or striated surface, usually polished
					Polished	Shiny smooth surface
					Smooth	Smooth to touch. Few or no surface irregularities
					Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.		40 		Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.
Crushed Seam (Note 3)	Seam with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock substance which may be more weathered than the host rock. The seam has soil properties.		50 		COATING TERMS	
					Clean	No visible coating
					Stained	No visible coating but surfaces are discoloured
					Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
Infilled Seam	Seam of soil substance usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1mm thick may be described as veneer or coating on joint surface.		65 		Coating	A visible coating up to 1mm thick. Thicker soil material is usually described using appropriate defect terms (eg, infilled seam). Thicker rock strength material is usually described as a vein.
Extremely Weathered Seam	Seam of soil substance, often with gradational boundaries. Formad by weathering of the rock substance in place.		32 		BLOCK SHAPE TERMS	
					Blocky	Approximately equidimensional
					Tabular	Thickness much less than length or width
					Columnar	Height much greater than cross section

Notes on Defects:

1. Usually borehole logs show the true dip of defects and face sketches and sections the apparent dip.
2. Partings and joints are not usually shown on the graphic log unless considered significant.
3. Sheared zones, sheared surfaces and crushed seams are faults in geological terms.

Appendix D1

Test Pit Logs

Engineering Log - Excavation

Excavation No. **CTP 01**

Sheet 1 of 1

Office Job No.: **ENVIWOLL00250AB**

Client: **TRUenergy**

Date started: **23.2.2010**

Principal:

Date completed: **23.2.2010**

Project: **Geotechnical, Contamination & Groundwater Invest.**

Logged by: **LD**

Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

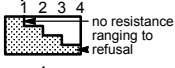
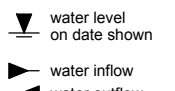
Checked by: **CCQ/SM**

equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297130.88 m R.L. Surface: 10.60

excavation dimensions: 2.5m long 0.45m wide Northing: 6176433.76 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	100 pocket 200 300 400 penetro- meter	structure and additional observations
BH		N	E	10.5		CL/CH	TOPSOIL; Sandy CLAY: Medium to high plasticity, grey/orange/brown/cream mottled, fine to coarse grained sand, with some fine to coarse grained sub-angular to sub-rounded gravel and surface rootlets.	<Wp	VSt/H		TOPSOIL/ALLUVIAL No odour
		NONE OBSERVED		0.5		ML	SILT: Grey, with a trace of fine to coarse grained sand.	<Wl	H		ALLUVIAL No odour
				1.0		CH	CLAY: High plasticity, brown, with some fine to coarse grained sand and fine to medium grained sub-rounded gravel.	>Wp			
				1.5		CL/CH	Sandy Gravelly CLAY: Medium to high plasticity, brown/orange/red/cream mottled, fine to coarse grained sub-rounded to sub-angular gravel, fine to coarse grained sand.				
				2.0			SANDSTONE: Fine to medium grained, orange/brown/cream/red, with some fine to medium grained sub-rounded gravel, very low to low strength.				
				2.5			SANDSTONE: Fine to medium grained, orange/brown/cream/red with some grey/purple laminate and some fine to medium grained sub-rounded gravel, low to medium strength.				
				8.5			Test pit CTP 01 terminated at 1.7m				CTP 1 Terminated at 1.7m on very slow progress

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 resistance 3 refusal 4 refusal water  ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **LD**

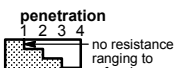



 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 296991.44 m R.L. Surface: 9.74
 excavation dimensions: 3m long 0.45m wide Northing: 6176470 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations	
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400		
BH		N		E	9.5			FILL/TOPSOIL; Clayey SILT: Brown, low to medium plasticity clay, with some fine to coarse grained sub-rounded to sub-angular gravel and surface rootlets, with a trace of fine to medium grained sand.	<Wp	St	X	TOPSOIL (FILL) No odour	
									M	MD		FILL (COALWASH) No odour	
				E	0.5		CH	FILL; Sandy GRAVEL: Fine to coarse grained, dark grey/black, sub-angular, fine to coarse grained sand, with some silt.	>Wp	VSt	X	FILL (CRUSHED SANDSTONE) No odour	
					9.0			FILL; Sandy CLAY: High plasticity, brown/orange/cream mottled, fine to coarse grained sand.		VSt/H	X	ALLUVIAL No odour	
					1.0			CLAY: High plasticity, brown, with some fine to coarse grained sand and fine to medium grained sub-rounded gravel.			X		
					8.5		CL/CH	Sandy Gravelly CLAY: Medium to high plasticity, brown/orange/red/cream mottled, fine to coarse grained sub-rounded to sub-angular gravel, fine to coarse grained sand.		H	X	RESIDUAL No odour	
					1.5		SC	Clayey SAND: Fine to medium grained, orange/brown/cream/red mottled, low to medium plasticity clay, with some fine to medium grained sub-angular gravel and silt.	M	VD	X	XW SANDSTONE (BERRY SILTSTONE) No odour	
					8.0			SANDSTONE: Fine to medium grained, orange/brown/red/cream, with some fine to medium grained sub-rounded gravel, very low to low strength.			X	HW SANDSTONE (BERRY SILTSTONE)	
					2.0								
					7.5			SANDSTONE: Fine to medium grained, orange/brown/cream/red with some grey and purple laminate, with some fine to medium grained sub-rounded gravel, low to medium strength.					MW SANDSTONE (BERRY SILTSTONE)
					2.5			Test pit CTP 02 terminated at 2.35m					CTP Terminated at 2.35m on very slow progress

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **LD**

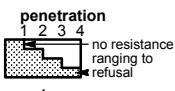
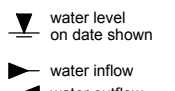
 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 296968.6 m R.L. Surface: 15.08
 excavation dimensions: 3m long 0.45m wide Northing: 6176373.22 m datum:

excavation information				material substance										
method	penetration			notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer			structure and additional observations
	1	2	3								100 kPa	200 kPa	300 kPa	
BH					15.0			FILL; Sandy GRAVEL: Fine to coarse grained, dark grey/black, sub-angular, fine to coarse grained sand, with some silt and surface rootlets.	M	D				FILL (COALWASH) No odour
					0.5			FILL; Clayey GRAVEL: Fine to coarse grained, orange/brown/cream mottled, sub-angular, medium to high plasticity clay, with some sub-angular to sub-rounded cobbles up to 200mm and boulders up to 400mm.	>Wp	H				FILL (CRUSHED SANDSTONE) No odour
					14.5		CH	FILL; Sandy CLAY: Medium to high plasticity, orange/brown/cream mottled, fine to coarse grained sand, with some fine to coarse grained sub-angular gravel, with a trace of cobbles up to 200mm.						ALLUVIAL No odour
					1.0		SC	CLAY: High plasticity, brown, with some fine to coarse grained sand and fine to medium grained sub-rounded gravel.						
					14.0			Clayey SAND: Fine to medium grained, orange/brown/cream, low to medium plasticity clay, with some fine to coarse grained sub-angular gravel.	M	VD				RESIDUAL/XW SANDSTONE No odour
					1.5			SANDSTONE: Fine to medium grained, orange/brown/cream/red, with some fine to medium grained sub-rounded gravel, very low to low strength.						HW SANDSTONE (BERRY SILTSTONE)
					13.5									
					2.0									
					13.0									
					2.5									

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to refusal 3 refusal 4 refusal water  ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **LD**

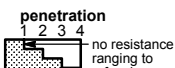
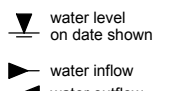
 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 296968.6 m R.L. Surface: 15.08
 excavation dimensions: 3m long 0.45m wide Northing: 6176373.22 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N	NONE OBSERVED		12.5				SANDSTONE: Fine to medium grained, orange/brown/cream, with some fine to medium grained sub-rounded gravel, low to medium strength.				MW SANDSTONE
				D		3.0							
				D	12.0								
									Test pit CTP 03 terminated at 3.1m				CTP 3 Terminated at 3.1m on slow to very slow progress
						3.5							
						4.0							
						4.5							
						5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **LD**

 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297055.98 m R.L. Surface: 15.81
 excavation dimensions: 2.5m long 0.45m wide Northing: 6176353.25 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E	15.5			TOPSOIL; Clayey SILT: Brown, low to medium plasticity clay, with some fine to coarse grained sub-rounded to sub-angular gravel, with surface rootlets and pockets of black organics.	<Wl	VSt	X	TOPSOIL No odour
				U ₅₀	0.5		CH	CLAY: High plasticity, brown, with some fine to coarse grained sand and fine to medium grained sub-rounded gravel, with some pockets of black organics.	>Wp		X	ALLUVIAL No odour
		NONE OBSERVED			15.0		CL/CH	Sandy Gravelly CLAY: Medium to high plasticity, orange/brown/cream/red mottled, fine to coarse grained sub-rounded to sub-angular gravel, fine to coarse grained sand.		H	X	RESIDUAL/XW SANDSTONE No odour
					14.5			SANDSTONE: Fine to medium grained, orange/brown/cream/red, with some fine to medium grained sub-rounded gravel, very low to low strength.			600	HW SANDSTONE (BERRY SILTSTONE)
					13.5			SANDSTONE: Fine to medium grained, orange/brown/cream/red with some grey/purple laminate, with some fine to medium grained sub-rounded gravel, low to medium strength.			600	MW SANDSTONE (BERRY SILTSTONE)
					14.0			CTP 4 Terminated at 1.75m on very slow progress				

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **LD**

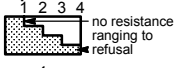



 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297125.73 m R.L. Surface: 13.23
 excavation dimensions: 4m long 0.45m wide Northing: 6176364.31 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N						TOPSOIL; Clayey SILT: Brown, low to medium plasticity clay, with some sub-rounded to sub-angular gravel and surface rootlets.	<Wp	St	X	TOPSOIL No odour
					13.0		ML			St/Vst	X	
					0.5		CH	Sandy SILT: Grey/brown, fine grained sand, with some fine to coarse grained sub-rounded to sub-angular gravel and medium to high plasticity clay, with a trace of cobbles up to 200mm.	>Wp	H	X	ALLUVIAL No odour
					12.5		CL	CLAY: High plasticity, brown, with some fine to coarse grained sand and fine to medium grained sub-rounded gravel.		VSt	X	RESIDUAL No odour
					1.0		GC	CLAY: Low to medium plasticity, orange/grey mottled, with some fine grained sand and fine to medium grained sub-rounded to sub-angular gravel and silt.		VD	X	XW SILTSTONE (BERRY SILTSTONE) No odour
					12.0			Clayey GRAVEL: Fine to coarse grained, orange/grey, sub-angular, medium to high plasticity clay, with some silt.	M			
					1.5			SILTSTONE: Fine grained, orange/grey, medium strength, with some clay lenses.				HW SILTSTONE (BERRY SILTSTONE)
					11.5			Test pit CTP 05 terminated at 1.55m				CTP 5 Terminated at 1.55m on very slow progress (possibly on MW Siltstone)
					2.0							
					11.0							
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297136.96 m R.L. Surface: 13.16
 excavation dimensions: 3m long 0.6m wide Northing: 6176262.26 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E	13.0		CL	TOPSOIL; Sandy CLAY: Medium plasticity, pale brown, fine grained sand, with some fine grained angular siltstone gravel and some roots.	<Wp	VSt		TOPSOIL No odour
		NONE OBSERVED			0.5		CH	Sandy CLAY: High plasticity, pale brown with some orange/brown iron stained pockets, fine grained sand, with some fine to medium grained angular siltstone gravel and some roots.		H		RESIDUAL No odour
					12.5			SILTSTONE: Iron stained orange/brown with moderately weathered pockets, with some fine grained sand, pale brown shale bands up to 30mm thick, distinctly bedded at about 5° dipping towards the south east, low strength.				HW/MW SILTSTONE (BERRY SILTSTONE)
					1.0							
					12.0			Test pit CTP 06 terminated at 1.1m				CTP 06 Terminated at 1.10m on refusal
					1.5							
					11.5							
					2.0							
					11.0							
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**





 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

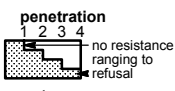
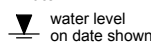
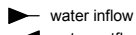
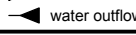
 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 296990.63 m R.L. Surface: 18.77
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176302.59 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E & QC2	18.5		CH	FILL; Sandy Clayey GRAVEL: Fine to coarse grained, black, coalwash gravel, high plasticity brown clay, fine to coarse grained sand, with some roots.	D	VD		TOPSOIL/FILL: Possible old road surface. No odour
		NONE OBSERVED			0.5			Sandy CLAY: High plasticity, orange/brown with some yellow/brown pockets, with some fine grained angular siltstone gravel and some roots.	<Wp	H		RESIDUAL No odour
					18.0			SILTSTONE: Iron stained orange/brown with some grey pockets, with some fine grained sand, pale brown shale bands up to 30mm thick, distinctly bedded at about 5°, low strength.				HW/MW SILTSTONE (BERRY SILTSTONE)
					17.5							
					1.5			Test pit CTP 07 terminated at 1.4m				CTP 07 Terminated at 1.40m on refusal
					17.0							
					2.0							
					16.5							
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**





 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297062.46 m R.L. Surface: 20.56
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176225.41 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations
BH		N	E	20.5			TOPSOIL/FILL; Sandy Gravelly CLAY: Medium plasticity, brown, fine to coarse grained angular sandstone gravel, fine to medium grained sand, with some roots.	<Wp	H		TOPSOIL/FILL: Mound is covered in short grass <300mm high. No odour
		NONE OBSERVED		20.0			FILL; Sandy CLAY: High plasticity, brown to dark brown/black when wet, with some fine to coarse grained angular sandstone gravel and fine roots, with some to a trace of angular sandstone cobbles.			600	FILL; Formation for fill mound No odour
			E & QC3	19.5							
				19.0							
				18.5							
				2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**





 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297062.46 m R.L. Surface: 20.56
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176225.41 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	100 pocket 200 penetro- 300 kPa 400 meter	structure and additional observations
BH		N NONE OBSERVED		18.0			FILL; Sandy CLAY: High plasticity, brown to dark brown/black when wet, with some fine to coarse grained angular sandstone gravel and fine roots, with some to a trace of angular sandstone cobbles. (continued)	<Wp	H		FILL; Formation for fill mound No odour
			E	17.5 3.0			FILL; CLAY: High plasticity, grey, with some fine grained sand and fine roots.		H/Fb		FILL: ASH? No odour
				17.0 3.5			SILTSTONE: Iron stained orange/brown with moderately weathered grey pockets, with some fine grained sand, with a trace of pale brown shale bands up to 200mm thick, distinctly bedded at 0° to 10°, low strength.				HWMW SILTSTONE (BERRY SILTSTONE)
				16.5 4.0			Test pit CTP 08 terminated at 4m				CTP 08 Terminated at 4.0m on very slow progress
				16.0 4.5							
				5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**





 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297062.39 m R.L. Surface: 20.43
 excavation dimensions: 3m long 0.6m wide Northing: 6176175.07 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E					FILL; Sandy CLAY: Medium plasticity, brown, fine to medium grained sand, with some fine to coarse grained angular sandstone gravel and roots.	<WP	H		TOPSOIL/FILL: Mound is covered in short grass 300mm high No odour
					20.0	0.5			FILL; Sandy CLAY: High plasticity, brown, with some fine to coarse grained angular sandstone gravel and roots, with some to a trace of angular sandstone cobbles.				FILL: Formation for fill mound No odour
			NONE OBSERVED		19.5	1.0						600	
					19.0	1.5							
					18.5	2.0							
				E	18.0	2.5			FILL; CLAY: High plasticity, grey with some orange/brown pockets, with some fine roots, with a trace of fine grained angular gravel.	Wp		600	FILL No odour Not insitu

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**





 Test pit location: **Zone 3 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297062.39 m R.L. Surface: 20.43
 excavation dimensions: 3m long 0.6m wide Northing: 6176175.07 m datum:

excavation information					material substance							
method	penetration 1 2 3	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 300 400	structure and additional observations
BH		N	NONE OBSERVED	E	17.5 3.0			FILL; CLAY: High plasticity, grey with some orange/brown pockets, with some fine roots, with a trace of fine grained angular gravel. <i>(continued)</i>	Wp	H		FILL Odour similar to decaying vegetation
					17.0 3.5			FILL; Sandy CLAY: High plasticity, brown, with some fine to coarse grained angular sandstone gravel and approximately 30% roots, with some to a trace of angular sandstone cobbles. ...Approximately 30% to 40% of decaying root material between 2.90m to 3.60m.	<Wp			FILL Mild strength decaying odour omitted between 2.9m to 3.6m.
					16.5 4.0							FILL: Very dusty (airborne soil particulate)
					16.0 4.5							
					15.5 5.0			Test pit CTP 09 terminated at 4.6m				CTP 09 Terminated at 4.60 due to extent of extendahoe reach, end on steady progress

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**





 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297017.53 m R.L. Surface: 9.09
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176034.24 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3				RL			soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N	NONE OBSERVED	E	9.0		CH	Sandy CLAY: High plasticity, orange/brown, with some fine to coarse grained angular sandstone gravel and roots. SILTSTONE: Iron stained orange/brown with some grey moderately weathered pockets, with some fine grained sand, distinctly bedded at 0° to 5° slightly dipping in about 200°, low strength.	<Wp	VSt		RESIDUAL/XW SANDSTONE No odour MW/MW SILTSTONE (BERRY SILTSTONE)
					0.5							
					8.5			Test pit CTP 10 terminated at 0.6m				CTP 10 Terminated at 0.6m on refusal
					1.0							
					1.5							
					2.0							
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**






 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

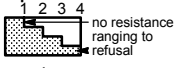



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297107.41 m R.L. Surface: 6.81
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176084.56 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E	6.5		CH	Sandy CLAY: High plasticity, pale brown, with some fine to coarse grained angular siltstone gravel and roots.	<Wp	H		RESIDUAL/XW SILTSTONE No odour
		NONE OBSERVED			0.5			SILTSTONE: Iron stained orange/brown with some fine to coarse grained angular siltstone gravel and roots.				HW SILTSTONE (BERRY SILTSTONE) with some XW seams.
					6.0							HW/MW SILTSTONE (BERRY SILTSTONE)
					1.0							
					5.5							
					1.5			Test pit CTP 11 terminated at 1.3m				CTP 11 Terminated at 1.3m on refusal
					5.0							
					2.0							
					4.5							
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

Client: **TRUenergy**

Date started: **24.2.2010**

Principal:

Date completed: **24.2.2010**

Project: **Geotechnical, Contamination & Groundwater Invest.**

Logged by: **CA**

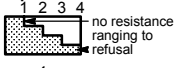
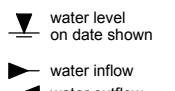
Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

Checked by: **CCQ/SM**

equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297192.85 m R.L. Surface: 6.91
excavation dimensions: 2.5m long 0.6m wide Northing: 6176127.64 m datum:

excavation information					material substance											
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer kPa	200	300	400	structure and additional observations
BH	1 2 3	N		E		6.5			FILL; Sandy CLAY: High plasticity, brown, fine grained sand, with some roots.	<Wp	VSt					TOPSOIL/FILL No odour
						0.5			FILL; Sandy CLAY: Medium plasticity, pale yellow/pale brown with pale orange/brown pockets, fine to medium grained sand, with some fine to coarse grained angular siltstone gravel and fine roots.	Wp	St		X			FILL: Cover of fill No odour
				E		6.0			FILL; CLAY: Medium to high plasticity, grey with orange/brown/red-brown pockets, with some fine to coarse grained angular siltstone gravel, large diameter tree roots and wooden planks, with a trace of fine grained sand.	>Wp	VSt					FILL: Wood and tree roots (4 x 2inch) and large diameter tree roots. Note: Water is not an inflow but instead staning water caught in air pit voids between wood fill. Slight hydrogan sulphide odour
						5.5										
						5.0			SILTSTONE: Iron stained, orange/brown with some moderately weathered grey pockets, with some fine grained sand, low strength.							HW/MW SILTSTONE (BERRY SANDSTONE)
						2.0			Test pit CTP 12 terminated at 2m							CTP 12 Terminated at 2.0m on refusal
						4.5										
						2.5										

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  water 	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**



 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

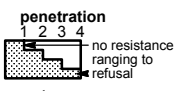



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297304.76 m R.L. Surface: 4.03
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176463.2 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E		0.5		CL/CH	Sandy CLAY: Medium to high plasticity, orange/brown, fine to coarse grained sand, with some fine to coarse grained angular siltstone gravel and roots.	<Wp	H		RESIDUAL/XW SILTSTONE No odour
		NONE OBSERVED			3.5	0.5			SILTSTONE: Iron stained orange/brown with some pale yellow pockets with some red/brown iron stone pockets approximately 20 to 100mm in diameter, low strength.				HW SILTSTONE (BERRY SILTSTONE)
					3.0	1.0			Test pit CTP 13 terminated at 0.9m				CTP 13 Terminated at 0.9m on refusal
					2.5	1.5							
					2.0	2.0							
					2.5	2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 4 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: E-W Easting: 297159.83 m R.L. Surface: 3.11
 excavation dimensions: 5.15m long 0.7m wide Northing: 6175878.99 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N		E	3.0			FILL; Sandy GRAVEL: Fine to coarse grained, black/dark grey, sub-rounded to sub-angular (shale and coal), fine to coarse grained sand, with a trace of cobbles up to 200mm and boulders up to 305mm in length (shale)	D	L		FILL (COALWASH) No odour
					0.5				M	MD		
					2.5							
				E	1.0							
				E	2.0							
					1.5							
					2.0							
				E	1.0							
					2.5			...No gravel and cobbles noted from 2.4m to 2.5m.				

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to refusal 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

 Test pit location: **Zone 4 (a) Tallawarra Lands, Yallah, NSW**

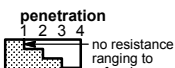



 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: E-W Easting: 297159.83 m R.L. Surface: 3.11
 excavation dimensions: 5.15m long 0.7m wide Northing: 6175878.99 m datum:

excavation information						material substance						
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N			0.5			FILL; Sandy GRAVEL: Fine to coarse grained, black/dark grey, sub-rounded to sub-angular (shale and coal), fine to coarse grained sand, with a trace of cobbles up to 200mm and boulders up to 305mm in length (shale) <i>(continued)</i>	M	MD		FILL (COALWASH)
					3.0			...Some silt from 3.0m to 3.75m.	M/W			Brackish/organic odour at 2.9m
				E	0.0							
					3.5							
					-0.5							
					4.0				W	L		
				E	-1.0		CL	CLAY: Medium plasticity, brown/grey, with a trace of rootlets and silt. ...Becoming pale grey/grey at 4.25m.	Wp	F	X	ALLUVIAL Brackish/organic odour
					4.5							
					-1.5							
				E								
					5.0		CL	Sandy CLAY: Medium plasticity, pale grey/orange mottled, fine to medium grained sand.	>=Wp	F	X	CTP 14 Terminated at 4.95m on alluvial due to continual water inflows into the test pit

Sketch

Test pit CTP 14 terminated at 4.95m

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 4 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: N-S Easting: 297638.9 m R.L. Surface: 1.99
 excavation dimensions: 4.5m long 0.7m wide Northing: 6175820.19 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer	structure and additional observations
	1 2 3				RL	metres			soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400 kPa	
E		N		E		0.5			FILL; Sandy GRAVEL: Fine to coarse grained, black/dark grey, fine to coarse grained sand, with some cobbles (shale and coal) up to 200mm and boulder up to 250mm.	D	L/MD		FILL - COALWASH No odour
					1.0	1.0				M	MD		
				E		1.5							
				E		2.0							
						2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **24.2.2010**

Principal:

 Date completed: **24.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

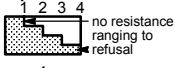
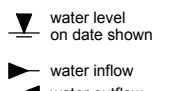
 Test pit location: **Zone 4 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: N-S Easting: 297638.9 m R.L. Surface: 1.99
 excavation dimensions: 4.5m long 0.7m wide Northing: 6175820.19 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N							FILL; Sandy GRAVEL: Fine to coarse grained, black/dark grey, fine to coarse grained sand, with some cobbles (shale and coal) up to 200mm and boulder up to 250mm. <i>(continued)</i>	M	MD		FILL - COALWASH No odour
					-1.0	3.0		CL	CLAY: Medium plasticity, grey/brown, with a trace of rootlets and silt.	W	L		ALLUVIAL Brackish/organic odour
				E					...Becoming grey with orange mottling at 3.25m.	>Wp	F	X	
					-1.5	3.5			...Becoming grey/orange mottled at 3.45m.			X	
					-2.0	4.0			Test pit CTP 15 terminated at 3.85m			X	CTP 15 Terminated at 3.85m due to steady water inflow into the test pit
					-2.5	4.5							
					-3.0	5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  ▽ water level on date shown ▸ water inflow ◀ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 4 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297715.58 m R.L. Surface: 2.94
 excavation dimensions: 5.78m long 0.7m wide Northing: 6176096.46 m datum:

excavation information					material substance							
method	penetration 1 2 3	support	water	notes samples, tests, etc	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
E		N			0.5 1.0 1.5 2.0 2.5			FILL; Sandy GRAVEL: Fine to coarse grained, black, sub-angular (shale), fine to coarse grained sand, with some cobbles up to 130mm (shale).	M	MD/D		FILL - COALWASH No odour

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 4 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297715.58 m R.L. Surface: 2.94
 excavation dimensions: 5.78m long 0.7m wide Northing: 6176096.46 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N							FILL; Sandy GRAVEL: Fine to coarse grained, black, sub-angular (shale), fine to coarse grained sand, with some cobbles up to 130mm (shale). <i>(continued)</i>	M	MD/D		FILL - COALWASH
				E						W	VL/L		
					0.0	3.0			Test pit CTP 16 terminated at 2.9m				CTP 16 Terminated at 2.9m due to excess water inflow
					-0.5	3.5							
					-1.0	4.0							
					-1.5	4.5							
					-2.0	5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

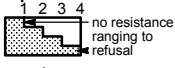



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: E-W Easting: 297773.6 m R.L. Surface: 3.51
 excavation dimensions: 5.2m long 0.7m wide Northing: 6176446.09 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations
E		N		3.0 2.5 2.0 1.5 2.5			FILL; Sandy GRAVEL: Fine to coarse grained, black, sub-angular, fine to coarse grained sand, with a trace of cobbles up to 180mm (shale).	D/M	MD/D		FILL - COALWASH No odour
			E	0.5							
			Bs	2.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**



 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: E-W Easting: 297773.6 m R.L. Surface: 3.51
 excavation dimensions: 5.2m long 0.7m wide Northing: 6176446.09 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N				3.0			FILL; Sandy GRAVEL: Fine to coarse grained, black, sub-angular, fine to coarse grained sand, with a trace of cobbles up to 180mm (shale). <i>(continued)</i>	D/M	MD/D		FILL - COALWASH No odour
				E	3.5								Brackish/organic odour noted at 3.4m in water
				E	4.0			CL	CLAY: Medium plasticity, grey, with some fine to medium grained sand, with a trace of rootlets with white blotches (algae/fungi) and silt.	Wp	St	x	ALLUVIAL? Organic odour
					4.0				Test pit CTP 18 terminated at 3.95m				CTP 18 Terminated at 3.95m due to large quantities of water entering the excavation. End on steady progress
					4.5								
					5.0								

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

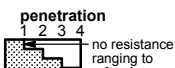



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297667.79 m R.L. Surface: 4.25
 excavation dimensions: 6.75m long 0.7m wide Northing: 6176797.44 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N		E	4.0			FILL; Silty SAND: Fine to medium grained, brown.	D	L/MD		TOPSOIL/FILL No odour
					0.5			FILL; CLAY: Medium plasticity, grey/brown with some orange mottling, with a trace of fine to medium grained sub-angular gravel, rootlets and silt.	<Wp	VSt		FILL (General) No odour
				E	3.5							
					1.0			FILL; CLAY: Medium to high plasticity, pale grey/orange mottled, with some fine to medium grained sand and silt.	Wp			FILL/REWORKED RESIDUAL AND XW SILTSTONE No odour
				E	3.0							
					1.5							
					2.5							
					2.0							
					2.0			FILL; Sandy CLAY: Medium plasticity, pale grey with some orange mottling, fine to medium grained sand.	<Wp	VSt/H		
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

Excavation No. **CTP 19**

Sheet 2 of 3

Office Job No.: **ENVIWOLL00250AB**

Client: **TRUenergy**

Date started: **23.2.2010**

Principal:

Date completed: **23.2.2010**

Project: **Geotechnical, Contamination & Groundwater Invest.**

Logged by: **DJD**

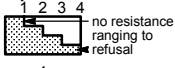



Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

Checked by: **CCQ/SM**

equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297667.79 m R.L. Surface: 4.25
 excavation dimensions: 6.75m long 0.7m wide Northing: 6176797.44 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations	
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400		
E		N			1.5			FILL; Sandy CLAY: Medium plasticity, pale grey with some orange mottling, fine to medium grained sand. (continued) ...Some pale grey/pale green colour from 2.75m to 3.05m.	<Wp	VSt/H		FILL/REWORKED RESIDUAL AND XW SILTSTONE	
				E	3.0					H		X	
				E	1.0		CL	CLAY: Medium plasticity, grey with orange/red mottling, with a trace of fine grained gravel, rootlets, contorted bedding and silt.				X	ALLUVIAL? No odour
			NONE OBSERVED		3.5								
					0.5								
					4.0		CL	CLAY: Low to medium plasticity, grey and black, with a trace of fine grained gravel, rootlets, charcoal and silt.					
				E	0.0							X	
					4.5		CL/CH	CLAY: Medium to high plasticity, grey with orange/red mottling, with a trace of rootlets, contorted bedding and silt.	Wp	St		ALLUVIAL No odour	
					-0.5								
					5.0								

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297667.79 m R.L. Surface: 4.25
 excavation dimensions: 6.75m long 0.7m wide Northing: 6176797.44 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer	structure and additional observations
	1 2 3				metres			soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400 kPa	
E		N			-1.0			CLAY: Medium to high plasticity, grey with orange/red mottling, with a trace of rootlets, contorted bedding and silt. <i>(continued)</i>	Wp	St		ALLUVIAL No odour
		NONE OBSERVED		E	5.5			Clayey SAND/Sandy CLAY: Low plasticity, fine to coarse grained sand, pale grey with pockets of orange iron staining.	M/<Wp	VSt	X	XW SILTSTONE No odour
				E	-1.5		SC/CL					
					6.0			Test pit CTP 19 terminated at 6.05m				CTP 19 Terminated at 6.05m due to maximum reach of excavator bucket. End on steady progress
					-2.0							
					6.5							
					-2.5							
					7.0							
					-3.0							
					7.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

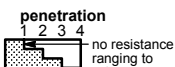
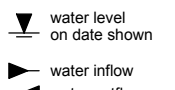
 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: N-S Easting: 297555.63 m R.L. Surface: 5.49
 excavation dimensions: 3.45m long 0.7m wide Northing: 6176817.26 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N		E		0.5			FILL; CLAY: Medium plasticity, dark grey, with some fine to medium grained sand, with a trace of rootlets and silt.	Wp	F/Fb		TOPSOIL/FILL No odour
						1.0		CL/CH	CLAY: Medium to high plasticity, dark grey/red-brown mottled, with a trace of rootlets and silt.		VSt		ALLUVIAL No odour
				E		1.5						X	
						2.0		CL	Sandy CLAY: Medium plasticity, dark grey/orange mottled, with a trace of fine grained gravel.	<=Wp			
						2.5							
				E		3.0		CL	CLAY: Medium plasticity, pale grey with some pale orange mottling, with a trace of fine to medium grained sand and silt.			X	
						3.5							
						4.0							
						4.5							
						5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 resistance 3 refusal 4 refusal water  ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

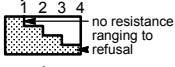



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: N-S Easting: 297555.63 m R.L. Surface: 5.49
 excavation dimensions: 3.45m long 0.7m wide Northing: 6176817.26 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N				3.0			CLAY: Medium plasticity, pale grey with some pale orange mottling, with a trace of fine to medium grained sand and silt. <i>(continued)</i>	<=Wp	VSt		ALLUVIAL No odour
				E	2.5	3.0		CL	CLAY: Medium plasticity, grey, with a trace of rootlets and silt.		VS/Fb	X	
					2.0	3.5		CL	Sandy CLAY: Medium plasticity, pale grey/white with some orange mottling, fine to medium grained sand.	Wp	VSt		RESIDUAL? No odour
					1.5	4.0							
				E	1.0	4.5						X	
					0.5	5.0			Test pit CTP 20 terminated at 4.65m				CTP 20 Terminated at 4.65m due to maximum reach of excavator

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

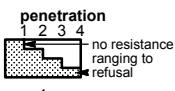



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297296 m R.L. Surface: 5.10
 excavation dimensions: 3.65m long 0.7m wide Northing: 6176831 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N		E	5.0			FILL; Clayey SILT: Dark brown, medium plasticity clay, with a trace of rootlets.	M	L		TOPSOIL/FILL No odour
				E	4.5			FILL; Sandy CLAY: Low plasticity, orange/grey mottled, fine to medium grained sand, with some fine to medium grained sub-rounded to sub-angular gravel, with a trace of rootlets.	<Wp	H		FILL (General) No odour
				E	4.0			FILL; Silty SAND: Fine to medium grained, white/pale grey with patchy pale orange mottling.	D			
				E	3.0			FILL; CLAY: Low plasticity, dark grey, with some fine to medium grained sand, with a trace of fine grained sub-rounded to sub-angular gravel and silt.	<Wp	VSt		
					2.5							FILL

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

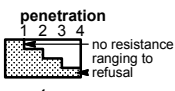
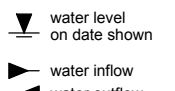
 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297296 m R.L. Surface: 5.10
 excavation dimensions: 3.65m long 0.7m wide Northing: 6176831 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	100 pocket 200 300 400 penetro- meter	structure and additional observations
E		N	E	2.5	[Cross-hatched pattern]		FILL; CLAY: Medium plasticity, dark grey with pockets of red and orange iron staining, with a trace of fine to coarse grained gravel and silt. (<i>continued</i>)	<Wp	VSt		FILL No odour
		NONE OBSERVED		3.0				FILL; CLAY: Medium to high plasticity, dark grey, with a trace of silt.	Wp		
				2.0							
				3.5							
				1.5							
				4.0		CL	CLAY: Medium plasticity, pale grey, with some fine to medium grained sand, with a trace of silt.		VSt		RESIDUAL No odour
			E	1.0	[Diagonal hatched pattern]						
				4.5			Test pit CTP 21 terminated at 4.25m				CTP 21 Terminated at 4.25m due to maximum reach of excavator arm. End on steady progress
				0.5							
				5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

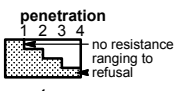



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297393.48 m R.L. Surface: 3.33
 excavation dimensions: 3.15m long 0.7m wide Northing: 6176404.63 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N		E	3.0			FILL; Gravelly SAND: Fine to coarse grained, black, fine to coarse grained sub-angular (shale) gravel, with a trace of silt and cobbles up to 170mm (shale).	M	MD		FILL - COALWASH No odour
				E	0.5			FILL; SILT: Pale grey, horizontal bedding noted (consolidated beds).	<Wp/Wf/St/Fb			FILL - ASH No odour
				E	2.5				>Wp	S/F	×	
				E	1.0			FILL; CLAY: Low to medium plasticity, brown/grey and green, with some fine to medium grained sub-angular sandstone gravel, green staining and silt.	Wp	St/VSt	×	FILL No odour
				E	2.0							
				E	1.5							
				E	2.0			FILL; CLAY: Low to medium plasticity, orange/green/grey/whitie mottled, with some fine to coarse grained sub-rounded sandstone gravel, with a trace of cobbles and boulders up to 240mm, red/green staining/dischouration and silt.		St	×	
				E	1.0							
				E	2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297393.48 m R.L. Surface: 3.33
 excavation dimensions: 3.15m long 0.7m wide Northing: 6176404.63 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N								Wp	St		FILL No odour
				E	0.5			SP	SAND: Fine to coarse grained, orange/brown.	M	D		XW SANDSTONE No odour
					3.0				Test pit CTP 22 terminated at 2.9m				CTP 22 Terminated at 2.9m on rock
					0.0								
					3.5								
					-0.5								
					4.0								
					-1.0								
					4.5								
					-1.5								
					5.0								

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

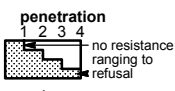



 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

equipment type and model: 20T EXCAVATOR	Pit Orientation:	Easting: 297690.09 m	R.L. Surface: 2.94
excavation dimensions: 3.5m long 0.7m wide		Northing: 6176270.62 m	datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	100 pocket 200 300 400 penetro- meter kPa	structure and additional observations
E		N	E	2.5			FILL; Gravelly SAND: Fine to coarse grained, black, fine to coarse grained sub-angular (shale) gravel. FILL; SILT: Pale grey, with some bands of consolidated ash with horizontal bedding, with a trace of fine to medium grained sand. ...Cave-in noted from 0.75m to 1.5m. ...Dialated soil patches at 1.5m to 2.0m.	M <WI	L/MD S/F/Fb		FILL - COALWASH No odour FILL - ASH No odour

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

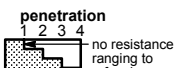
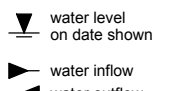
 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297690.09 m R.L. Surface: 2.94
 excavation dimensions: 3.5m long 0.7m wide Northing: 6176270.62 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
		N						FILL; SILT: Pale grey, with some bands of consolidated ash with horizontal bedding, with a trace of fine to medium grained sand. <i>(continued)</i>	<Wl	S/F/Fb		FILL - ASH No odour
				E	0.0		MH	Clayey SILT: Black, low plasticity clay, with a trace of rootlets.	<Wl/>Wp	F/St	X	FORMER TOPSOIL Organic odour
					3.0		CL	CLAY: Medium plasticity, pale brown/brown/orange, with some fine to medium grained sand and silt.	>Wp			ESTUARINE/ALLUVIAL Organic/Brackish odour
					3.5		CL	CLAY: Medium plasticity, grey/brown/orange, with some bivalve shells 5mm to 15mm diameter and silt.		S		ESTUARINE Organic/brackish odour
				E	-1.0			Test pit CTP 23 terminated at 3.95m			X	CTP 23 Terminated at 3.95m due to continual cave-in
					4.0							
					-1.5							
					4.5							
					-2.0							
					5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  ▽ water level on date shown ▸ water inflow ◀ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

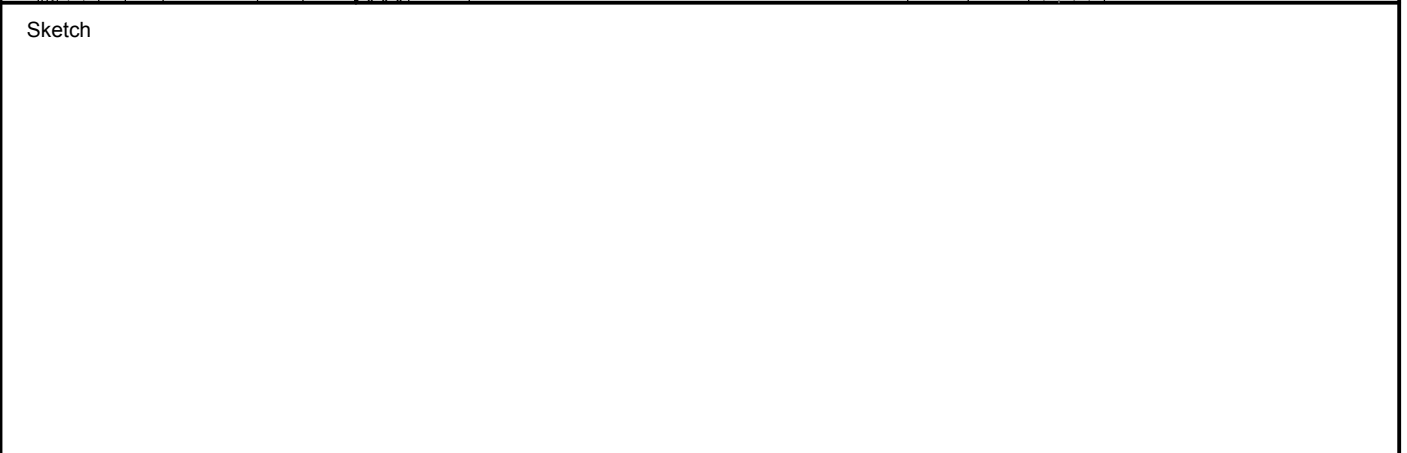
 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297761.15 m R.L. Surface: 3.81
 excavation dimensions: 3.1m long 2.1m wide Northing: 6176622.66 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.				
E		N		E	3.5			FILL; Gravelly SAND: Fine to coarse grained, dark grey/black, fine to coarse grained sub-angular gravel.	D	L		FILL - COALWASH No odour
				E	0.5			FILL; SILT: Grey/pale grey, with a trace of medium to coarse grained gravel consolidated band from 0.3m to 0.6m.	<WI	F		FILL - ASH No odour
					3.0			FILL; SAND: Fine to coarse grained, grey/dark grey.	M	VL/L		
				E	1.0							
					2.5							
				D	1.5			FILL; SILT: Grey/pale grey, with some fine grained sand.	<WI	S/F		
					2.0							
					2.0							
					1.5							
					2.5							

Sketch



method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ▾ water inflow ▸ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **23.2.2010**

Principal:

 Date completed: **23.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

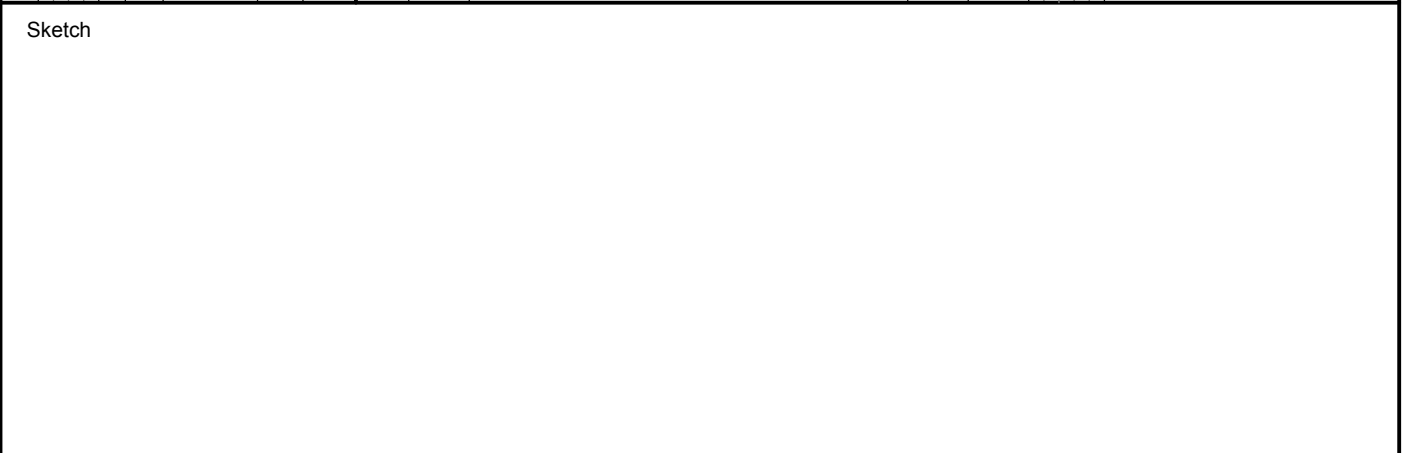
 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297761.15 m R.L. Surface: 3.81
 excavation dimensions: 3.1m long 2.1m wide Northing: 6176622.66 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
		N			1.0			FILL; SILT: Grey/pale grey, with some fine grained sand. (continued)	<Wl	S/F		FILL - ASH No odour
					3.0							
					0.5							
				E	3.5		CL	CLAY: Medium plasticity, grey with dark grey mottling, with some fine to medium grained sand, with a trace of charcoal fragments and rootlets and silt.	Wp	F	x	ALLUVIAL No odour
					4.0							
					0.0							
					4.0							
					-0.5							
					4.5		CL/CH	CLAY: Medium to high plasticity, grey, with some silt.	>Wp	VS/S	x	
				E	-1.0			Test pit CTP 24 terminated at 4.7m				CTP 24 Terminated at 4.7m due to maximum reach of excavator. End on steady progress
					5.0							

Sketch



method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**



 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297527.05 m R.L. Surface: 6.71
 excavation dimensions: 2.85m long 0.7m wide Northing: 6176886.55 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N		E	6.5				FILL; Silty SAND: Fine to medium grained, brown, with a trace of rootlets.	M	MD/D		TOPSOIL/FILL No odour
		NONE OBSERVED		E	1.5				FILL; Silty CLAY: Medium to high plasticity, dark brown/grey with pale orange patchy mottling, with a trace of rootlets, (fill evident as contorted bedding).	Wp	VSt	X	FILL (General) No odour
				E	5.0								
					2.0								
					4.5								
					2.5								

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**

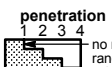
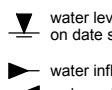
 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20T EXCAVATOR Pit Orientation: Easting: 297527.05 m R.L. Surface: 6.71
 excavation dimensions: 2.85m long 0.7m wide Northing: 6176886.55 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N			4.0			FILL; Silty CLAY: Medium to high plasticity, dark brown/grey with pale orange patchy mottling, with a trace of rootlets. (fill evident as contorted bedding). <i>(continued)</i>	Wp	VSt		FILL (General) No odour
				E	3.0			FILL; CLAY: High plasticity, grey/red mottled, with a trace of rootlets.		H		
		NONE OBSERVED			3.5							
				E	3.5		SC/CL	Clayey SAND/Sandy CLAY: Low plasticity, fine to medium grained, pale grey/pale yellow.	M/<Wp	St/Fb		ALLUVIAL No odour
					3.0							
					4.0							
					2.5			...Becoming pale grey at 4.2m.				
					4.5							
					2.0			Test pit CTP 25 terminated at 4.55m				CTP 25 Terminated at 4.55m due to maximum reach of excavator. End on steady progress
					5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance ranging to refusal 2 3 4 water  ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20 TONNE EXCAVATOR Pit Orientation: Easting: 297395.97 m R.L. Surface: 6.96
 excavation dimensions: 3.2m long 0.7m wide Northing: 6176905.81 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
1 2 3									soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N		E	6.5	0.5			FILL; Silty SAND: Fine to medium grained, brown, with a trace of rootlets.	M	MD/D		TOPSOIL/FILL No odour
		NONE OBSERVED			6.0	1.0			...Becoming grey/dark brown at 1.15m.		VSt		
				E	5.5	1.5							
					5.0	2.0			FILL; CLAY: Medium to high plasticity, grey, with a trace of fine grained coal gravel, rootlets and silt.	Wp	St/VSt		FILL? No odour
				E	4.5	2.5						X	

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **22.2.2010**

Principal:

 Date completed: **22.2.2010**





 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **DJD**





 Test pit location: **Zone 3 (a) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 20 TONNE EXCAVATOR Pit Orientation: Easting: 297395.97 m R.L. Surface: 6.96
 excavation dimensions: 3.2m long 0.7m wide Northing: 6176905.81 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
E		N			4.0	3.0		CL	Sandy CLAY: Medium plasticity, pale grey/pale orange mottled, fine to medium grained sand, with a trace of rootlets.	Wp	St/VSt		FILL? No odour RESIDUAL No odour
		NONE OBSERVED		E	3.5	3.5						X	
					3.0	4.0		CL	CLAY: Medium plasticity, grey with patches of orange/red (iron staining), with a trace of fine to medium grained sand and silt.	<Wp	H	X	
					2.5	4.5			...Becoming pale grey/pale orange mottled at 4.6m.			X	
					2.0	5.0			Test pit CTP 26 terminated at 4.9m			X	CTP 26 Terminated at 4.9m due to maximum reach of excavator bucket. End on slow progress

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging 3 to 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299226.39 m R.L. Surface: 10.34
 excavation dimensions: 3m long 0.6m wide Northing: 6178806.56 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer	structure and additional observations
	1 2 3				metres			soil type: plasticity or particle characteristics, colour, secondary and minor components.			kPa	
BH		N		E	10.0			FILL; Sandy CLAY: Medium to high plasticity, brown with some pale brown pockets, with some concrete cobbles.	<Wp	VSt		FILL/TOPSOIL: Bricks, plastic, steel pipe No odour
					0.5			FILL; Sandy Clayey GRAVEL: Fine to coarse grained, pale brown, angular, highly weathered sandstone, fine to coarse grained sand, high plasticity clay, with some unsorted fill materials and rounded sandstone cobbles and boulders up to 400mm in diameter.	D/M	VD		FILL: Mounds include bricks, steel pipe, plastic, aluminium cans No odour
		NONE OBSERVED		E	0.5							
					1.0							
				E	0.5							
					1.0		CH	Sandy CLAY: High plasticity, pale brown with some iron stained orange/brown and grey pockets, fine to medium grained sand, with some fine roots.	Wp	VSt		RESIDUAL No odour
				E	0.5							
					1.0							
					1.5						X	
					2.0							
					2.0							
					2.0		CL	Sandy CLAY: Medium plasticity, orange/brown, yellow/brown, grey and pale yellow mottled, with some highly weathered, low strength, angular sandstone gravel and cobbles and fine roots.	<Wp	H		XW with some HW SANDSTONE X GRAVEL No odour
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

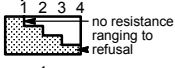



 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299226.39 m R.L. Surface: 10.34
 excavation dimensions: 3m long 0.6m wide Northing: 6178806.56 m datum:

excavation information					material substance											
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer	200	300	400	structure and additional observations
BH	1 2 3	N							SANDSTONE: Fine to medium grained, pale yellow/pale brown with some iron stained orange/brown pockets, distinctly bedded at 0° to 10°. Test pit CTP 27 terminated at 2.7m	<Wp	H					HW SANDSTONE (BUDGONG SANDSTONE) CTP 27 Terminated at 2.7m on refusal
					7.5	3.0										
					7.0											
					6.5											
					6.0											
					5.5											
					5.0											

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance ranging to refusal 2 3 4 water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

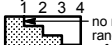
 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299150.26 m R.L. Surface: 14.17
 excavation dimensions: 2m long 0.6m wide Northing: 6178760.58 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E & QC9	14.0			FILL; Sandy CLAY: High plasticity, brown to iron stained orange/brown, fine to medium grained sand, with some fine to coarse grained angular gravel and roots.	Wp	VSt		FILL: Edge mound for horse training coral, containing broken terracotta pipe No odour
		NONE OBSERVED			13.5							
				E	1.0							
					13.0		CH	Sandy CLAY: High plasticity, brown, fine to medium grained sand, with some roots, with a trace of fine to medium grained sub-rounded to sub-angular sandstone gravel.		VSt/H		RESIDUAL(ALLUVIAL?) No odour
					12.5							
					2.0							
					12.0			SANDSTONE: Fine to medium grained, pale yellow/pale brown bedded at 0° to 5°.				HW SANDSTONE (BUDGONG SANDSTONE)
								Test pit CTP 28 terminated at 2.2m				CTP 28 Terminated at 2.2m on refusal
					2.5							

Sketch



method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **5.3.2010**

Principal:

 Date completed: **5.3.2010**



 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**





 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 298999.36 m R.L. Surface: 28.52
 excavation dimensions: 2.5m long 0.6m wide Northing: 6178677.18 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N	NONE OBSERVED	E & QC11	28.0	0.5		CL/CH	FILL; Sandy CLAY: Medium to high plasticity, brown, fine to medium grained sand, with some roots. Sandy CLAY: Medium to high plasticity, dark brown to black, with some fine to coarse grained sub-angular highly weathered low strength sandstone gravel and roots.	<Wp	VSt	X	FILL/TOPSOIL: Contains - plastic, broken glass, broken tiles No odour TOPSOIL/RESIDUAL? No odour
					27.5	1.0			SANDSTONE: Fine to medium grained, iron stained orange/brown mottled black, with a trace of extremely weathered sandy clay seams up to 10mm thick, massive structure. Test pit CTP 29 terminated at 0.75m			X	HW SANDSTONE (BUDGOING SANDSTONE) CTP 29 Terminated at 0.75m on refusal
					27.0	1.5							
					26.5	2.0							
						2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **5.3.2010**

Principal:

 Date completed: **5.3.2010**




 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**





 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 298988.67 m R.L. Surface: 28.04
 excavation dimensions: 2m long 0.6m wide Northing: 6178609.01 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	100 pocket penetro- 300 kPa 400 meter	structure and additional observations
BH		N NONE OBSERVED	E & QC12	0.5		CH	FILL; Sandy CLAY: High plasticity, brown with some pale yellow/pale brown pockets, with some fine to coarse grained angular sandstone gravel, rounded sandstone cobbles and boulders up to 450mm diameter and roots.	Wp	VSt		TOPSOIL/FILL: (Dam Wall) No odour
				27.5			Sandy CLAY: High plasticity, pale orange with brown and grey pockets, fine to medium grained sand, with some fine to medium grained sandstone gravel and roots.		H		TOPSOIL/RESIDUAL No odour
				27.0			SANDSTONE: Fine to medium grained, iron stained orange/brown, with a trace of extremely weathered sandy clay bands up to 20mm wide, with a trace of dark grey to black lenses, bedded at 0° to 10°. Test pit CTP 30 terminated at 0.85m				HW SANDSTONE (BUDGONG SANDSTONE) CTP 30 Terminated at 0.85m on refusal
				26.5							
				26.0							
				2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299256.08 m R.L. Surface: 21.02
 excavation dimensions: 2.5m long 0.6m wide Northing: 6178587.49 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E				CL	TOPSOIL; Silty SAND: Fine to medium grained, brown, with some roots.	<Wp	H		TOPSOIL No odour
		NONE OBSERVED			20.5	0.5		CH	Sandy CLAY: High plasticity, pale yellow/pale brown, fine to medium grained sand, with some fine roots and fine grained angular sandstone gravel.	Wp	VSt	X	RESIDUAL No odour
					20.0	1.0			SANDSTONE: Fine to medium grained, pale yellow/pale brown with some iron stained orange brown pockets, appears to be more massive.				HW SANDSTONE (BUDGONG SANDSTONE)
									Test pit CTP 31 terminated at 1.1m				CTP 31 terminated @1.10m. End at refusal
					19.5	1.5							
					19.0	2.0							
						2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ▸ water inflow ◀ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**




 Logged by: **CA**

 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

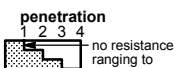



 Checked by: **CCQ/SM**

equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299442.84 m R.L. Surface: 34.53

excavation dimensions: 3m long 0.6m wide Northing: 6178452.59 m datum:

excavation information					material substance							
method	penetration 1 2 3	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations
BH		NONE OBSERVED		E	34.0		CL	TOPSOIL; Sandy CLAY: Medium plasticity, brown, fine to medium grained sand, with some roots.	<Wp	H	550	TOPSOIL No odour
					0.5		CH	Sandy CLAY: High plasticity, pale yellow/pale brown, fine to medium grained sand, with some fine roots and fine grained angular sandstone gravel.	Wp	VSt	x	RESIDUAL/XW SANDSTONE? No odour
					1.0			SANDSTONE: Fine to medium grained, pale yellow/pale brown with some iron stained orange brown pockets, appears to be more massive. Test pit CTP 32 terminated at 1m				HW SANDSTONE (BUDGONG SANDSTONE) CTP 32 terminated @1.0m end at refusal
					1.5							
					2.0							
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299713.65 m R.L. Surface: 9.77
 excavation dimensions: 3m long 0.6m wide Northing: 6178401.52 m datum:

excavation information					material substance							
method	penetration 1 2 3	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	100 pocket 200 300 400 penetro- meter	structure and additional observations
BH		NONE OBSERVED		E	9.5		CL	TOPSOIL; Sandy CLAY: Medium plasticity, brown, fine to medium grained sand, with some fine roots, with a trace of fine to coarse grained angular sandstone gravel.	<Wp	VSt		TOPSOIL No odour
				U ₅₀	0.5		CH	CLAY: High plasticity, brown with some iron stained orange pockets, with some fine roots and fine to medium grained sand, with a trace of fine coarse grained angular sandstone gravel.	Wp	St		RESIDUAL/XW SANDSTONE No odour
					9.0						X	
					1.0							
					8.5			SANDSTONE: Fine to medium grained, yellow/brown with some orange/brown iron stained pockets. Test pit CTP 33 terminated at 1.2m				HW SANDSTONE (BUDGONG SANDSTONE) CTP 33 terminated @1.2m end at refusal
					1.5							
					2.0							
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water water level on date shown water inflow water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

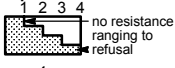



 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299604.7 m R.L. Surface: 9.92
 excavation dimensions: 3m long 0.6m wide Northing: 6178142.62 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer	structure and additional observations
	1 2 3				RL	metres			soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400 kPa	
BH		NONE OBSERVED		E				CL	TOPSOIL; Sandy CLAY: Medium plasticity, brown, fine to medium grained sand, with some roots and fine to coarse grained sub-angular sandstone gravel.	<Wp	VSt		TOPSOIL No odour
					9.5	0.5		CH	Sandy CLAY: High plasticity, orange/brown, with some fine roots and highly weathered, low to medium strength, angular sandstone gravel and cobbles diameter up to 400mm, with a trace of angular boulders.		VSt/H		XW SANDSTONE No odour
					9.0	1.0			SANDSTONE: Fine to medium grained, pale yellow/pale brown with some iron stained orange/brown pockets, distinctly bedded @ 0° to 10° Test pit CTP 34 terminated at 0.85m				HW SANDSTONE (BUDGONG SANDSTONE)
					8.5	1.5							
					8.0	2.0							
					7.5	2.5							CTP 34 terminated @0.85m end on refusal

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 299360.13 m R.L. Surface: 12.15
 excavation dimensions: 2.5m long 0.6m wide Northing: 6178270.57 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer kPa	structure and additional observations	
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400		
BH				NONE OBSERVED	12.0		CL	TOPSOIL; Sandy CLAY: Medium plasticity, brown, with some roots and fine to medium grained angular sandstone gravel.	<Wp	VSt		TOPSOIL No odour	
					11.5		CH	Sandy CLAY: High plasticity, pale brown/pale orange with some orange pockets, with a trace of fine roots and fine to coarse grained angular sandstone gravel.	Wp			X	RESIDUAL/XW SANDSTONE No odour
					11.0			SANDSTONE: Fine to medium grained, iron stained orange/brown with some extremely weathered sandy clay seams, medium to high plasticity.					HW SANDSTONE (BUDGONG SANDSTONE) SOME XW SANDY-CLAY SEAMS
					10.5			SANDSTONE: Fine to medium grained, orange/brown to indistinctly bedded, visible silica minerals Test pit CTP 35 terminated at 1.6m					HW SANDSTONE (BUDGONG SANDSTONE) CTP 35 terminated @ 1.6m end on refusal
					10.0								
					2.0								
					2.5								

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water water level on date shown water inflow water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**





 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

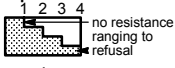



 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 298768.09 m R.L. Surface: 18.14
 excavation dimensions: 2.5m long 0.6m wide Northing: 6178810.15 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		NONE OBSERVED		E & QC14	18.0			FILL; Sandy CLAY: Medium to high plasticity, brown, orange/brown, pale yellow/pale brown, dark grey, with some fine to coarse grained, highly weathered, low to medium strength sandstone gravel.	<Wp	VSt/H		FILL: REWORKED CUT FROM DAM CONSTRUCTION No odour
					17.5							
				E	17.0		CH	TOPSOIL; Sandy CLAY: High plasticity, dark brown to black, fine to medium grained sand, with some fine roots.	>Wp	St	X	TOPSOIL No odour
				U ₅₀	16.5		CH	Sandy CLAY: High plasticity, green/grey mottled pale grey, fine to medium grained sand, with some fine roots.		St/VSt	X	COLLUVIAL No odour
				ASS	16.0							COLLUVIAL/RESIDUAL No odour
					2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

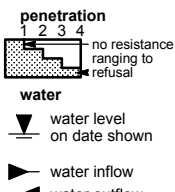
 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 298768.09 m R.L. Surface: 18.14
 excavation dimensions: 2.5m long 0.6m wide Northing: 6178810.15 m datum:

excavation information					material substance							
method	penetration 1 2 3	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter 100 200 300 400 kPa	structure and additional observations
BH		NONE OBSERVED			15.5			Sandy CLAY: High plasticity, green/grey mottled pale grey, fine to medium grained sand, with some fine roots. <i>(continued)</i>	>Wp	St/VSt		COLLUVIAL/RESIDUAL No odour
					3.0			SANDSTONE: Fine to medium grained, pale yellow/pale brown with some iron stained orange/brown pockets, bedded at 0° to 10°.				HW SANDSTONE (BUDGONG SANDSTONE)
					15.0			Test pit CTP 36 terminated at 3.2m				CTP 36 terminated @3.2m end on refusal
					3.5							
					14.5							
					4.0							
					14.0							
					4.5							
					13.5							
					5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **4.3.2010**

Principal:

 Date completed: **4.3.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

 Test pit location: **Zone 1 (b) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

equipment type and model: 8 TONNE EXTENDAHOE Pit Orientation: Easting: 298813.53 m R.L. Surface: 22.09

excavation dimensions: 2.5m long 0.6m wide Northing: 6178776.81 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations
BH		NONE OBSERVED	E & QC13	22.0		CL	TOPSOIL; Sandy CLAY: Medium plasticity, brown, fine to medium grained sand, with some fine to medium roots and large tree roots.	<Wp	VSt		TOPSOIL No odour
			U ₅₀	21.5		CH	Sandy CLAY: High plasticity, yellow/brown, fine to medium grained sand, with some fine roots and fine to coarse grained angular sandstone gravel.	Wp			RESIDUAL No odour
				21.0		CH	Sandy CLAY: Medium plasticity, pale yellow/pale brown with some highly weathered low to medium strength, fine to coarse grained angular sandstone gravel and cobbles, with a trace of roots.	<Wp	H	600	XW WITH SOME HW SANDSTONE GRAVEL
				21.0			SANDSTONE: Fine to medium grained, pale yellow/pale brown, with some iron stained brown/red to black pockets, massive structure. Test pit CTP 37 terminated at 1.1m				HW SANDSTONE (BUDGONG SANDSTONE) CTP 37 terminated @3.2m end on refusal
				20.5							
				2.0							
				20.0							
				2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **25.2.2010**

Principal:

 Date completed: **25.2.2010**












 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**




 Test pit location: **Zone 2 (c) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297822.89 m R.L. Surface: 2.36
 excavation dimensions: 3m long 0.6m wide Northing: 6176836.87 m datum:

excavation information					material substance						
method	penetration 1 2 3	support water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	100 pocket penetro- meter kPa 300 400	structure and additional observations
BH		N	E	2.0			FILL; Sandy GRAVEL: Fine to coarse grained, dark grey, angular, coal gravel (heavy), fine to coarse grained sand, with some roots, with a trace of clay.	D	VD		FILL: Surface No odour
			E	0.5			FILL; Clayey SAND: Fine to medium grained, brown/orange-brown/brown mottled, with some fine roots.	M	D		FILL: Base for roadway - some 20mm Y-Bars (Rio) No odour
			E	1.5							
			E & ASS	1.0							
				1.5							
				2.0							
				2.5		SC	Clayey SAND: Fine to medium grained with some coarse grained, grey with iron stained orange/brown pockets, with a trace of roots.	W	L		ALLUVIAL/ESTUARINE No odour
				0.5							
				2.0							
				0.0							
				2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration 1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **25.2.2010**

Principal:

 Date completed: **25.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

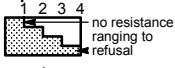
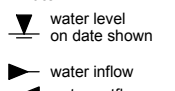
 Test pit location: **Zone 2 (c) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297822.89 m R.L. Surface: 2.36
 excavation dimensions: 3m long 0.6m wide Northing: 6176836.87 m datum:

excavation information					material substance												
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer	200	300	400	structure and additional observations	
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.								
BH		N	Very slow	ASS		-0.5		CL	Sandy CLAY: Low to medium plasticity, grey with iron stained orange/brown pockets, fine to medium grained sand.	Wp	St	X				ALLUVIAL/ESTUARINE No odour	
				ASS		-1.0			CH	Sandy CLAY: High plasticity, grey with orange/brown and pale green pockets, fine to medium grained sand, with some fine roots.		St/Vst		X			RESIDUAL/ALLUVIAL No odour
						-1.5			CH	Sandy CLAY: High plasticity, grey with pale green and pale orange-brown pockets, fine to medium sand.	<Wp/Wp	VSt			X		RESIDUAL No odour
						-2.0											
						-2.5											CTP 38 Terminated at 4.90m on slow progress (backhoe arm extent)
						-3.0											
						-3.5											
						-4.0											
						-4.5											
						-5.0			Test pit CTP 38 terminated at 4.9m								

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to refusal 3 4 water  ▽ water level on date shown ► water inflow ◄ water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **25.2.2010**

Principal:

 Date completed: **25.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

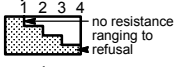



 Test pit location: **Zone 2 (c) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297985.66 m R.L. Surface: 1.70
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176860.75 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E & ASS	1.5		CH	TOPSOIL; Sandy CLAY: High plasticity, brown, fine to medium grained sand, with some fine roots.	<Wp	VSt		TOPSOIL No odour
					0.5		CL	Sandy CLAY: Medium plasticity, grey with iron stained orange/brown pockets, fine to medium grained sand, with some fine roots.	Wp		X	ALLUVIAL No odour
				ASS	1.0							
				ASS	1.0		SC	Clayey SAND: Fine to medium grained, grey with some pale orange/pale yellow/pale brown pockets, with some fine roots.	W	L		ALLUVIAL/ESTUARINE No odour
				ASS	0.5							
			Very slow	ASS	1.5							Test pit walls falling in under own weight
				ASS	0.0							
				ASS	2.0							
				ASS	-0.5		SC	Clayey SAND: Fine to medium grained, grey.		VL		
				ASS	2.5					L		

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 no resistance 2 ranging to 3 refusal 4 refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **25.2.2010**

Principal:

 Date completed: **25.2.2010**


 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

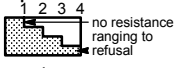



 Test pit location: **Zone 2 (c) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 297985.66 m R.L. Surface: 1.70
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176860.75 m datum:

excavation information					material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N			-1.0				Clayey SAND: Fine to medium grained, grey. <i>(continued)</i>	W	L		ALLUVIAL/ESTUARINE No odour
						3.0			Test pit CTP 39 terminated at 2.7m				CTP 39 Terminated at 2.7m on steady progress (unable to continue due to pit collapse)
						-1.5							
						3.5							
						-2.0							
						4.0							
						-2.5							
						4.5							
						-3.0							
						5.0							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

 Client: **TRUenergy**

 Date started: **25.2.2010**

Principal:

 Date completed: **25.2.2010**

 Project: **Geotechnical, Contamination & Groundwater Invest.**

 Logged by: **CA**

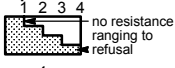



 Test pit location: **Zone 2 (c) Tallawarra Lands, Yallah, NSW**

 Checked by: **CCQ/SM**

 equipment type and model: 8T CAT EXTENDAHOE Pit Orientation: Easting: 298073.09 m R.L. Surface: 1.55
 excavation dimensions: 2.5m long 0.6m wide Northing: 6176784.15 m datum:

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	100 pocket penetrometer kPa	structure and additional observations
	1 2 3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
BH		N		E & ASS	1.5		CL	TOPSOIL; Sandy CLAY: Medium plasticity, brown, fine to medium grained sand, with some roots.	<Wp	VSt		TOPSOIL No odour
					0.5		CH	Sandy CLAY: High plasticity, brown with orange-brown/pale yellow mottling, fine to medium grained sand, with some fine roots.	Wp	St	X	ALLUVIAL No odour
				ASS	1.0							
				ASS	1.0		CH	Sandy CLAY: High plasticity, grey with orange/brown pockets, fine to medium grained sand, with a trace of roots. Sand content increasing	>Wp	F	X	
				ASS	0.5							
			Moderate	ASS	1.5		SC	Clayey SAND: Fine to medium grained, grey, with some fine to coarse grained rounded milky quartz and siltstone gravel.	W	L		ALLUVIAL/ESTUARINE No odour Test pit walls readily falling in under own weight below 1.4m
				ASS	0.0							
				ASS	2.0		CH	Sandy CLAY: High plasticity, dark grey/black, fine to medium grained sand, with some roots and decaying organic matter.	>Wp	S	X	ESTUARINE No odour
				ASS	-0.5							
				ASS	2.5							

Sketch

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	support S shoring N nil penetration  1 2 3 4 no resistance ranging to refusal water  water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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