Allam MHE Developments No.2 Pty Ltd

Acid Sulfate Soils Assessment

Proposed Manufactured Home Estate – Stage 2

82 Chapmans Road, Tuncurry

Report No. RG\$03357.1-AC 13 September 2023





RG\$03357.1-AC

13 September 2023

Allam MHE Developments No.2 Pty Ltd PO Box 7385 BAULKHAM HILLS BC NSW 2153

Attention: Mark Cerone

Dear Mark

RE: Proposed Manufactured Home Estate – Stage 2 – 82 Chapmans Road, Tuncurry Acid Sulfate Soils Assessment

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken an Acid Sulfate Soils assessment for the proposed Manufactured Home Estate Stage 2 at 82 Chapmans Road, Tuncurry. This report presents the results of the assessment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by

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Andrew Hills Senior Environmental Engineer

Reviewed by

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Steve Morton Principal Geotechnical Engineer

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1 INTRODUCTION

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken an Acid Sulfate Soils (ASS) assessment for the proposed Manufactured Home Estate (MHE) Stage 2 at 82 Chapmans Road, Tuncurry. The site location is shown on Figure 1 and the proposed site layout is shown on Figure 2.

The site comprises Lot 11 DP615229 and occupies approximately 16.3 hectares.

The purpose of the assessment is to identify if Actual or Potential ASS will be encountered during development of the site and if so, to develop an ASS Management Plan.

2 METHODOLOGY

The assessment of the site was undertaken on 1 and 2 August 2023 by an Engineer from RGS and involved:

- Review of previous geotechnical and geo-environmental assessment investigations undertaken within the vicinity of the site;
- Observation of site features and surrounding features relevant to the geotechnical conditions of the site;
- Logging and sampling of thirty-three test pits excavated using a track-mounted excavator; and
- Laboratory testing of representative samples.

Engineering logs of the test pits are presented in Appendix A. Laboratory test results are presented in Appendix B. Test locations are shown on Figure 3.

3 PREVIOUS INVESTIGATION

RGS has undertaken an ASS Assessment on the adjoining site to the north where the proposed MHE Stage 1 will be located. The findings of the ASS investigation are presented in report RGS03137.1-AB, dated 28 October 2022 and were reviewed as part of this assessment.

A summary of the key points and conclusions are provided below:

- Reference to the Coolongolook 1:25,000 Acid Sulfate Soil Risk Map indicates that the lowlying swampy western part of the site is situated within an area with a high probability of ASS within 1m of the ground surface;
- The ASS risk map indicates the central and eastern parts of the site to also be within an area with a high probability of ASS between 1m and 3m below the ground surface.
- Twenty-three samples obtained from the test pits were screened for the presence of actual or potential ASS using methods 23Af and 22Bf of the ASSMAC Acid Sulfate Soils Manual. The test results are attached. The results indicated:



- $_{\odot}$ The samples revealed pH_f values of 5.02 to 6.78 in distilled water. In this test, pH <4 can be an indicator of Actual ASS; and
- The samples revealed pH_{FOX} values of 1.90 to 4.46 in hydrogen peroxide. Values of less than 3 can be an indicator of Potential ASS.
- Five samples were submitted for Chromium Reducible Sulphur (CRS) analysis, to differentiate between potential organic or inorganic sources of sulfur;
- Each of the samples recorded Titratable Actual Acidity (TAA) concentration below the adopted action criteria, with exception of one sample which exceeded the action criteria indicating the presence of actual acidity;
- Oxidisable sulfur concentrations exceeded the adopted action criteria in two of the samples (TP49 0.8 1.0m and TP51 1.7 1.9m indicating the presence of potential sulphuric acidity. In addition, one sample TP53 0.0 0.2m exceeded the action criteria for net acidity. These soils are therefore considered to be Potential ASS. As such, an ASS Management Plan is required for this part of the site;
- It is understood that excavations for the proposed stormwater basin will be to approximately 1.45m below ground surface. The remainder of the site will be filled. As such the ASS Management Plan should be implemented for excavations for the stormwater basin in the south-west corner of the site, and for other excavations into natural ground profile in the low-lying swampy area in the western part of the site, and more generally in Terrain Zone 1; and
- The ASS Management Plan requirements for excavations into the natural ground profile in Terrain Zone 1 soils in the western parts of the site indicates that lime treatment at a rate of 9kg/tonne would be required.

4 SITE CONDITIONS

4.1 Surface Conditions

The site is rectangular in shape and is bound vacant land forming proposed MHE Stage 1 to the north, a former nursery and landscape supplies yard to the north-east, undeveloped land to the east, south and south-west and by Chapmans Road and undeveloped land to the west. The Wallamba River is located approximately 380m to the west of the site.

The central and eastern parts of the site are situated on a low-lying Aeolian sandplain with the natural ground level being typically flat.

The western part of the site is situated on low-lying swampy terrain and is also generally flat. Site surface elevations vary from about RL3m to RL4m.

There was an existing shed located in the north-west corner near a site entrance gate. The shed was of masonry block construction on a concrete slab floor with a corrugated metal roof and adjoining water tank. The shed appeared to have been constructed on a fill mound which graded to the south to natural ground level at about 2° to 3°.



Two small farm dams were present in the central-west and north-east corner of the site respectively.

Drainage of the site will be primarily via infiltration into the upper sandy soils.

The site had been recently slashed prior to the field investigations. Vegetation predominantly comprised grass and weeds with remnant stands of trees including Casuarina and Eucalypts up to 15m in height. The south-west corner comprised remnant uncleared bushland.

Typical site photographs are presented below.



4.2 Subsurface Conditions

Based on the topographic conditions, the site has been divided into three terrain zones. Reference to the MinView website indicates that the underlying geology varies with each terrain as outlined below:

- <u>Terrain Zone 1:</u> The eastern part of the site is underlain by Holocene beach ridge and associated strandplain deposits comprising marine sand, shell and gravel;
- <u>Terrain Zone 2:</u> The central part, north-west corner and south-west corner of the site are underlain by Holocene tidal-delta flat deposits comprising marine sand, silt, clay, shell and gravel; and
- <u>Terrain Zone 3:</u> The western and south-western parts of the site are underlain by Holocene floodplain deposits comprising silt, fluvial sand and clay.



The geology of the site is presented in Plate 1 below:

Plate 1: Reference to the MinView website indicates that Terrain Zone 1 is underlain by Holocene beach ridge and associated strandplain deposits, Terrain Zone 2 is underlain by Holocene tidal-delta flat deposits and Terrain Zone 3 is underlain by Holocene floodplain deposits.

The materials encountered during the investigation are summarised in Table 1 and Table 2 respectively. Further details are presented on the attached engineering logs.

Unit	Material	Material Description								
Unit 1	Topsoil	Silty SAND, fine to medium grained, some roots (central and eastern areas); or Silty CLAY, low plasticity, some sand, fine to medium grained, some roots (western area)								
Unit 2	Aeolian Soil	SAND, fine to coarse grained, trace roots								
Unit 3	Indurated Sand	SAND, fine to medium grained								
Unit 4	Alluvial Soil	Clayey SAND, fine to coarse grained, clay, low plasticity								

Table 1: Summary of Geotechnical Units

Depth of Material Layer (m) Terrain Unit 1 Unit 2 Unit 3 Unit 4 **Test Pit** Zone Topsoil Aeolian **Indurated Sand** Alluvial 0.0 - 0.2 0.2 - ≥2.5* TP1 1 ---___ TP2 1 0.0 - 0.2 0.2 - ≥2.5* ------TP3 1 0.5 - ≥2.5* --------TP4 1 0.0 - 0.4 0.4 - 1.5 1.5 - ≥2.5* ---1 ------TP5 0.0 – 0.3 0.3 - ≥2.5* 0.2 - ≥2.5* TP6 1 0.0 - 0.2 ------TP7 1 0.0 - 0.2 0.2 – 1.2 1.2 - ≥2.5* ---0.2 - ≥2.5* 0.0 – 0.2 TP8 1 ------TP9 1 0.0 - 0.2 0.2 - ≥2.5* ------TP10 2 0.0 – 0.2 0.2 - ≥2.5* ------2 TP11 0.0 – 0.2 0.2 - ≥2.5* -----2 0.0 - 0.2 0.2 - ≥2.5* TP12 ------2 0.0 – 0.2 0.2 - ≥2.5* TP13 -----TP14 2 0.0 - 0.2 0.2 - ≥2.5* ------2 TP15 0.0 - 0.2 0.2 - ≥2.5* -----TP16 2 0.0 – 0.2 0.2 - ≥2.5* ------TP17 2 0.0 - 0.2 0.2 - ≥2.0* --TP18 2 0.0 - 0.3 0.3 - ≥2.5* ------TP19 2 0.0 – 0.2 0.2 - ≥2.0* ------2 TP20 0.0 – 0.2 0.2 - ≥2.0* ------TP21 2 0.0 – 0.2 0.2 - ≥2.0* ------TP22 2 0.0 – 0.2 0.2 - ≥2.0* ------

Table 2: Summary of Subsurface Profile

	Depth of Material Layer (m)												
Test Pit	Terrain Zone	Unit 1 Topsoil	Unit 2 Aeolian	Unit 3 Indurated Sand	Unit 4 Alluvial								
TP23	2	0.0 – 0.2			0.2 - ≥2.0*								
TP24	2	0.0 - 0.2			0.2 - ≥2.0*								
TP25	2	0.0 - 0.2			0.2 - ≥2.0*								
TP26	3	0.0 – 0.25			0.25 - ≥2.0*								
TP27	3	0.0 - 0.2			0.2 - ≥2.0*								
TP28	3	0.0 – 0.25			0.25 - ≥2.0*								
TP29	3	0.0 – 0.25			0.25 - ≥2.0*								
TP30	3	0.0 – 0.25			0.25 - ≥2.0*								
TP31	3	0.0 – 0.25			0.25 - ≥2.0*								
TP32	3	0.0 – 0.25			0.25 - ≥2.0*								
TP33	2	0.0 – 0.25			0.25 - ≥2.0*								

Note: ≥ Indicates that base of material layer was not encountered

Indicates that the test pit was terminated due to excavation collapse

Indicates that the material was not encountered at the test location

Groundwater was encountered within each of the test pits at depths of between 1.0m and 1.5m below ground surface during the limited time they remained open on the days of the field investigations. It should be noted that fluctuations in groundwater levels can occur as a result of seasonal variations, temperature, rainfall, and other similar factors, the influence of which may not have been apparent at the time of the assessment.

5 ACID SULFATE SOILS

Reference to the Coolongolook 1:25,000 Acid Sulfate Soil Risk Map indicates that the low-lying swampy western part of the site is situated in an area with a high probability of ASS within 1m of the ground surface. The map indicates the central and eastern parts of the site to also be within an area with a high probability of ASS between 1m and 3m below the ground surface.



Acid Sulfate Soils (ASS) produce sulphuric acid when exposed to oxygen due to the presence of iron sulphides in the form of pyrite within the soil matrix. These soils form when iron-rich sediments are deposited in saltwater or brackish water environments. Prior to oxidation, these pyritic soils are referred to as Potential ASS. ASS that have produced acid as a result of oxidation are referred to as Actual ASS. They typically occur in natural, low-lying coastal depositional environments below approximately 5m AHD. In the field ASS are generally identified as saline sediments such as alluvial or estuarine soils or bottom sediments in creeks and estuaries.

In environments such as that which exists at the site, the pyrite and resultant acidity (if any) would exist within the fine-grained fraction of the sediment profile.

One hundred and twelve samples obtained from the test pits were screened for the presence of actual or potential ASS using methods 23Af and 22Bf of the ASSMAC Acid Sulfate Soils Manual. The test results are attached. The results indicated:

- The samples revealed pH_f values of 4.41 to 6.99 in distilled water. In this test, pH < 4 can be an indicator of Actual ASS; and
- The samples revealed pH_{FOX} values of 1.27 to 4.34 in hydrogen peroxide. Values of less than 3 can be an indicator of Potential ASS.

To provide a more comprehensive assessment, fifteen samples were submitted for Chromium Reducible Sulphur (CRS) analysis, to differentiate between potential organic or inorganic sources of sulfur. A summary of the test results is presented in Table 3.



Table 3: Summary of ASS CRS Test Results

T I D'I		Terrian		Acid Trai	l (mol H+/tonne)	S	ulfur Trail (m	nol H+/t)	Net Acidity	Liming Rate	
Test Pit	Depth (m)	Zone	Texture	ΤΑΑ	Action Criteria	S κCI	Scr	Action Criteria	(mol H+/tonne)	(kg / Tonne)	
TP 1	2.3 – 2.5	1	Coarse	16	18	14	91	18	107	8	
TP3	2.3 – 2.5	1	Coarse	7	18	4	33	18	40	3	
TP4	1.7 – 1.9	1	Coarse	16	18	12	128	18	144	11	
TP7	2.3 – 2.5	1	Coarse	21	18	5	50	18	71	5	
TP12	1.7 – 1.9	2	Coarse	6	18	7	106	18	113	8	
TP15	1.2 – 1.4	2	Coarse	13	18	16	135	18	148	11	
TP16	1.2 – 1.4	2	Coarse	20	18	22	429	18	449	34	
TP18	0.8 – 1.0	2	Coarse	5	18	9	92	18	97	7	
TP19	0.3 – 0.5	2	Coarse	5	18	8	122	18	127	10	
TP20	0.8 – 1.0	2	Coarse	5	18	8	95	18	100	8	
TP23	1.3 – 1.5	2	Coarse	5	18	12	102	18	107	8	
TP24	0.3 – 0.5	2	Medium	5	18	9	176	18	181	14	
TP25	1.8 – 2.0	2	Coarse	7	18	17	156	18	163	12	
TP30	1.3 – 1.5	3	Coarse	11	18	1	3	18	14	1	
TP33	0.8 – 1.0	2	Coarse	6	18	1	0	18	6	0	

Note: 1.

The adopted action criteria assume that >1,000 tonnes of soil is to be disturbed.

2. Values that are bold exceed the adopted action criteria.

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Each of the samples recorded a Titratable Actual Acidity (TAA) concentration below the adopted action criteria, with exception of sample TP7 2.3 – 2.5m and TP16 1.2 – 1.4m which exceeded the action criteria indicating the presence of actual acidity.

Oxidisable sulfur and net acidity concentrations exceeded the adopted action criteria in each of the samples with the exception of sample TP30 1.3 – 1.5m and TP33 0.8 – 1.0m, indicating the presence of sulfuric acidity. These soils are therefore considered to be Potential ASS (PASS). In addition, extractable sulfur concentrations exceeded the adopted action criteria in two samples TP7 2.3 – 2.5m and TP16 1.2 – 1.4m indicating some of the soils in these locations are Actual ASS (AASS). As such, an ASS Management Plan is required for the site.

Details of proposed earthworks and excavation depths are unknown at this stage. However, it is likely that there will be some filling of the site. As such the ASS Management Plan should be implemented for excavations into the natural ground profile across the MHE Stage 2 development area.

The ASS Management Plan is presented in Appendix C.

6 LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Regional Geotechnical Solutions Pty Ltd.

Geotechnical site investigation is based on data collection, judgment, experience, and opinion. By its nature, it is less exact than other engineering disciplines. The findings presented in this report and used as the basis for the recommendations presented herein were obtained using normal, industry accepted geotechnical design practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

The recommended depth and properties of any soil, rock, groundwater, or other material referred to in this report is an engineering estimate based on the information available at the time of writing. The estimate is influenced and limited by the fieldwork and testing method carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by

Midre Ady

Andrew Hills Senior Environmental Engineer

Reviewed by

Steve Morton Principal Geotechnical Engineer

Regional Geotechnical Solutions RG\$03357.1-AC 13 September 2023



Figures









Appendix A

Results of Field Investigations

					ENGI	NEE	RING LOG - TEST PIT			Т	EST		io: TP1
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		ansitional stra efinitive or di		PID DCP(x-y) Dynai	nic pen	on detector reading (ppm) etrometer test (test depth interval shown)		L Mi	D N		n Dense	
	st	trata change		HP	Hand	Penetro	meter test (UCS kPa)		D VE		ense ery De	ense	Density Index 65 - 85% Density Index 85 - 100%

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METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plastici characteristics,colour,minor componer		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш						SM	TOPSOIL: Silty SAND, fine to medium gra grey/black, some roots	ined, dark	M				TOPSOIL
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Stra	W a	ter Outflow anges		В		Sample		H Fb	Hard Friable			400	
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	Exca	vation and S	Sampling T	1			Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Е				-		SP	SAND: Fine to medium grained, pale grey/ brown, some roots	pale	M				AEOLIAN
	K 1/8/2023	1.20m	-	0.5_ - - 1.0_ -		SP	0.50m SAND: Fine to medium grained, grey/pale						
		ES 1.40m	-	- 1.5_			Colour change to pale brown/brown						
		1.70m ES 1.90m	-	- - 2.0_									
		2.30m ES 2.50m	-	2.5		- - - -	2.50m						
					-		Hole Terminated at 2.50 m due to collapse						
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	 tra D	radational or ansitional stra efinitive or dis rata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Densit</u> y	¥ V L N D V	D N D	ery Lo oose lediun ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION/ GEOTEC SOLUTIO	HNICA	L C	ENGII LIENT ROJEC	:	RING LOG - TEST PIT Allam Property Group ME: Proposed MHE			P	EST AGE OB I		IO: TP4 1 of 1 RGS03357.1
					ITE LO					L	OGC	GED B	BY: WW
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METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/p characteristics,colour,minor components	particle	MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		SM	TOPSOIL: Silty SAND, fine to medium grained grey/brown, some roots	ed, dark	М				TOPSOIL
	<u>1.20т</u> 820 ЕS		.20m			SP	<u>SAND</u> : Fine to medium grained, grey/pale gre						AEOLIAN
	< 1/8/2023	1.70m ES	-	- 1. <u>5</u> - -		SP	1.50m SAND: Fine to medium grained, pale brown/b	 prown	W				INDURATED SAND
		1.90m 2.30m ES 2.50m	-	2.0_ - - - - 2.5			2.50m						
				-	-		Hole Terminated at 2.50 m due to collapse						
<u>Wat</u> ▼	Wat (Dat	ter Level te and time s ter Inflow ter Outflow anges	shown)	Notes, Sa U₅₀ CBR E ASS B	50mm Bulk s Enviro Acid S Bulk S	Diame ample t nmenta	ter tube sample or CBR testing I sample ioil Sample	S So F Fi St St VSt Ve H Ha Fb Fr	ery Soft oft rm iff ery Stiff ard iable		<2 25 50 10 20 >4	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit
	G tra De	radational or ansitional stra efinitive or dis rata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>	V L ME D VE	L D M D	ery Lo bose lediun ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		DECISI		I	ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	IO: TP5
ā		REGION/ GEOTEC	HNIC/	AL.	CLIENT		Allam Property Group			F	PAGE	≣:	1 of 1
		SOLUTIO			PROJE	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
					SITE LO					L	.OGC	GED B	
					FEST L	OCAT	ION: Refer to Figure 1			C	DATE	:	1/8/23
		/IENT TYP IT LENGT		6T Ex 2.0 m		- 600 IDTH:	mm Toothed Bucket EASTING: 1.0 m NORTHING:	451322		SURF. DATU		RL:	AHD
		vation and S			VV	WIDTH: 1.0 m NORTHING: 6441737 m Material description and profile information					-	d Test	AND
	Exca			9							Fiel		
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш					-	SM	TOPSOIL: Silty SAND, fine to medium grai grey/black, some roots	ned, dark	М				TOPSOIL
						 SP	0.30m		-				AEOLIAN
					-		Child. The to mediain grainea, groypaid	gicy					
				0.5]							
					_:::::								
					-								
					-	ł							
					-	ł							
	23			1.0									
	1/8/2023				- 	}							
		1.20m			-	•							
		ES 1.40m				•							
				1.5		•							
		1.70m				•							
		ES			_								
		1.90m			-								
				2.0									
						1							
]							
		2.30m	-]							
		ES			- 								
	+	2.50m		2.5			2.50m Hole Terminated at 2.50 m			-			
					_		due to collapse						
					-								
					_								
					-								
LEG	END:		L	Notes, Sa	amples ar	d Tests		Consiste	ncv			CS (kPa	Moisture Condition
Wat	er			U ₅₀			: ter tube sample	VS \	/ery Soft Soft	t	<'	25 5 - 50	D Dry M Moist
Ŧ		ter Level te and time s	shown)	CBR E	Bulk s	sample	or CBR testing	FF	Firm Stiff		50	0 - 100	W Wet
▶	- Wa	ter Inflow	,	ASS	Acid S	Sulfate S	l sample Soil Sample	VSt \	/ery Stiff		20	00 - 200 00 - 400	
<u>Stra</u>		ter Outflow anges		В		Sample		Fb F	lard riable			400	
		Fradational or ansitional stra		Field Tes PID	Photo		on detector reading (ppm)	<u>Density</u>	V L	L	ery Lo oose		Density Index <15% Density Index 15 - 35%
		efinitive or di trata change	stict	DCP(x-y) HP	-		etrometer test (test depth interval shown) meter test (UCS kPa)		MI D	D	ense	n Dense	Density Index 65 - 85%
	3	s.ango							VE) V	ery D	ense	Density Index 85 - 100%

				E	ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	IO: TP6
		REGION/ GEOTEC			LIENT	:	Allam Property Group			F	AGE	: :	1 of 1
2		SOLUTIO			PROJEC	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
				S	SITE LO	CATI	ON: 82 Chapmans Road, Tuncurry			L	OGO	GED B	SY: WW
				Т	EST L	OCAT	ION: Refer to Figure 1			C	ATE		1/8/23
		IENT TYP					mm Toothed Bucket EASTING:	451216		SURF		RL:	
ΤE		IT LENGT		2.0 m	w	IDTH:	1.0 m NORTHING:	6441786	3 m I	DATU	1		AHD
	Exca	vation and S	Samplinę	3		7	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		SM	TOPSOIL: Silty SAND, fine to medium grain grey/black, some roots	ned, dark	М				TOPSOIL
						SP	SAND: Fine to medium grained, grey/pale g		-				AEOLIAN
				-		ł							
				0.5		•							
				.		ł							
	023			-									
	1/8/2023			-									
	<u> </u>	-		1.0_									
		1.20m											
				-		•							
		ES 1.40m		-	1								
				1.5		1							
				_]	•							
		1.70m											
		ES				•							
		1.90m		-									
				2.0									
				-		•							
				.]							
		2.30m	4	.									
		ES				ł							
	_	2.50m		2.5		•	2.50m						
				-	-		Hole Terminated at 2.50 m due to collapse						
LEG	GEND:		L	Notes, Sa	mples an	d Tests		Consiste	ency		<u> </u>	CS (kPa	Moisture Condition
	ter Wa (Da - Wa	ter Level te and time s ter Inflow ter Outflow	shown)	U ₅₀ CBR E ASS B	50mm Bulk s Enviro Acid S	n Diame ample f	ter tube sample or CBR testing I sample Soil Sample	VS S F St VSt H	Very Soft Soft Firm Stiff Very Stiff Hard Friable		<2 25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
<u></u>	G tra D	Gradational or ansitional stra Pefinitive or di trata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>	V L MI D VE	L N D	ery Lo bose lediun ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

				E	ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	10: TP7
		REGIONA GEOTEC		~	LIENT		Allam Property Group			P	AGE	Ξ:	1 of 1
_		SOLUTIO			ROJE	CT NA	ME: Proposed MHE			J	ОΒΙ	NO:	RGS03357.1
					SITE LO		, , , , , , , , , , , , , , , , , , ,			L	OGO	GED B	BY: WW
				Т	EST L	OCAT	ION: Refer to Figure 1			D	ATE	:	1/8/23
		/IENT TYP IT LENGT		6T Ex 2.0 m		- 600 IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	45125		SURF. DATU		RL:	AHD
		vation and S					Material description and profile information	044102	.9 111	DATO		d Test	AID
				9		Z				~			
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor component		MOISTURE	CONSISTENCY	Test Type	Result	Structure and additional observations
Ш						SM	TOPSOIL: Silty SAND, fine to medium grai grey/black, some roots	ned, dark	М				TOPSOIL
						SP	SAND: Fine to medium grained, grey/pale						
						ł							
				0.5		•							
						ł							
						•							
						ł							
						ł							
	023			1. <u>0</u>		•							
	1/8/2023					1							
	<u> </u>	1.20m	-			SP	1.20m		- w	-			INDURATED SAND
		ES					SAND. The to medium grained, brown dan						
		1.40m	_		ļ	•							
				1.5]							
		1.70m				ļ							
		ES				ł							
		1.90m	-	.		·							
				2.0_		ł							
				.									
		2.30m											
		F0				•							
		ES 2.50m		2.5		1	2.50m						
							Hole Terminated at 2.50 m due to collapse						
LEG	END:			Notes, Sa	mples an	nd Tests		Consist	ency		U	CS (kPa	Moisture Condition
Wat	_			U ₅₀			ter tube sample		Very Soft	t	<	25 5 - 50	D Dry M Moist
T		ter Level te and time s	shown)	CBR E	Bulk s	ample f	or CBR testing I sample	F	Firm		50	0 - 100 0 - 200	W Wet
►	- Wa	ter Inflow	í	ASS	Acid S	Sulfate S	Soil Sample	VSt	Very Stiff	f	20	00 - 400	
<u>Stra</u>	-	ter Outflow anges		В		Sample		H Fb	Hard Friable			400	
		Gradational or ansitional stra		Field Test PID	_	ionisatio	on detector reading (ppm)	<u>Density</u>	L	L	ery Lo oose	oose	Density Index <15% Density Index 15 - 35%
	D	efinitive or di		DCP(x-y) HP	-		etrometer test (test depth interval shown) meter test (UCS kPa)		MI D		lediur ense	n Dense	
	S	trata change					v7		VE		ery D	ense	Density Index 85 - 100%

					ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	IO: TP8
		REGION/			CLIENT		Allam Property Group			P	AGE	Ξ:	1 of 1
Ż		SOLUTIO			PROJE	CT NA	ME: Proposed MHE			J	ОΒΙ	NO:	RGS03357.1
				;	SITE LO	CATI	ON: 82 Chapmans Road, Tuncurry			L	.OGC	GED E	BY: WW
					TEST L	OCAT	ION: Refer to Figure 1			C	OATE	:	1/8/23
		IENT TYP		6T Ex			mm Toothed Bucket EASTING:	451247	m	SURF	ACE	RL:	
		IT LENGT		2.0 m	• w	IDTH:		: 6441885	m	DATU	-		AHD
	Exca	vation and S	Samplin	g		z	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTI (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plastici characteristics,colour,minor componer		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш					-	SM	TOPSOIL: Silty SAND, fine to medium gragey/black, some roots	iined, dark	М				TOPSOIL
									4				AEOLIAN
					-	SP	SAND: Fine to medium grained, grey/pale	grey					
				0.5									
					-								
					-								
					-								
					-								
	023			1.0	¥								
	1/8/2023				-								
	<u> </u>	1.20m	-		-								
		ES											
		1.40m			-								
				1.5									
		1.70m			-								
		ES											
		L3 1.90m											
				2.0									
						1							
		2.30m]							
		ES											
		2.50m		2.5	<u>,</u>	•	2.50m			<u> </u>			
					-		Hole Terminated at 2.50 m due to collapse						
					-								
					-								
					-								
LEG	END:		L	Notes. S	amples ar	d Test		Consiste	ncy			CS (kPa	Moisture Condition
Wat	er			U ₅₀			ter tube sample	VS \	/ery Sof Soft	t	<'	25 5 - 50	D Dry M Moist
Ŧ		ter Level te and time s	hown)	O₅₀ CBR E	Bulk s	sample	for CBR testing Il sample	FF	Firm Stiff		50) - 100) - 100)0 - 200	W Wet
	Wa	ter Inflow	,	ASS	Acid \$	Sulfate \$	i sample Soil Sample	VSt \	/ery Stif	F	20	00 - 400	
<u>Stra</u>		ter Outflow anges		B		Sample		Fb F	lard riable	•		400	
		radational or ansitional stra		Field Tes	Photo		on detector reading (ppm)	<u>Density</u>	V L	L	ery Lo oose		Density Index <15% Density Index 15 - 35%
		efinitive or di rata change	stict	DCP(x-y) HP	-		etrometer test (test depth interval shown) meter test (UCS kPa)		MI D	D	ense	n Dense	Density Index 65 - 85%
	31								VE) V	ery D	ense	Density Index 85 - 100%

				E	ENGI	NEE	RING LOG - TEST PIT				TE	EST	PIT N	o: TP9
		REGION/ GEOTEC	AL HNIC4		LIENT		Allam Property Group					٩GE		1 of 1
Ż		SOLUTIO			ROJE	CT NA	ME: Proposed MHE				JC)B N	10:	RGS03357.1
				S	SITE LO	CATI	ON: 82 Chapmans Road, Tuncurry				LC	COGO	GED B	Y: WW
				т	EST L	OCAT	ION: Refer to Figure 1				D	ATE	:	1/8/23
		IENT TYP					mm Toothed Bucket EASTING:		244 m				RL:	
		IT LENGT		2.0 m	w	IDTH:		64419)25 m	DA	TUN			AHD
	Exca	vation and S	Samplin	g		z	Material description and profile information					Field	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE	CONDITION	DENSITY	Test Type	Result	Structure and additional observations
Ш						SM	TOPSOIL: Silty SAND, fine to medium gra grey/black, some roots	ined, darl	k I	М				TOPSOIL
						 	0.20m							
						. 5P	SAND: Fine to medium grained, grey/pale	grey						
				0.5]								
						ł								
						ł								
						·								
	ß			1.0_		{								
	1/8/2023													
	7	1.20m				}								
	-	50												
		ES 1.40m				!								
				1.5										
]]								
		1.70m]									
		ES				ł								
		1.90m												
				2.0										
						1								
						1								
		2.30m]	!								
]								
		ES 2.50m		2.5]	2.50m							
							Hole Terminated at 2.50 m due to collapse							
							'							
					1									
]									
150	END:		L	Notes C	mples	d Tr-f		C'					20 /4-0-0	Mojoture Condition
LEG Wat				Notes, Sa			-	VS	Stency Very	Soft		<2		D Dry
Ŧ		ter Level	hown	U₅₀ CBR	Bulk s	sample	ter tube sample or CBR testing	S F	Soft Firm			50	5 - 50) - 100	M Moist W Wet
▶	Wa	te and time s ter Inflow	nown)	E ASS			il sample Soil Sample	St VSt	Stiff Very	Stiff		20	00 - 200 00 - 400	W _p Plastic Limit W _L Liquid Limit
Stra		ter Outflow anges		В	Bulk S	Sample		H Fb	Hard Friab	le		>4	100	
<u></u>	G	radational or		Field Test PID		ionisati	on detector reading (ppm)	Densit		V L		ry Lo ose	ose	Density Index <15% Density Index 15 - 35%
	D	ansitional str efinitive or di		DCP(x-y)	Dynar	nic pen	etrometer test (test depth interval shown)			MD D	Me	dium	n Dense	Density Index 35 - 65%
	st	trata change		HP	nand	renetro	meter test (UCS kPa)			D VD		nse ry De	ense	Density Index 65 - 85% Density Index 85 - 100%

		REGION/ GEOTECI SOLUTIO	HNICA	L C P S	ROJEC	: CT NA DCATI				F J L	Page Iob I	NO: GED E	1 of 1 RGS03357.1
		IENT TYP IT LENGT		6T Exe 2.0 m		- 600 IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	4511		SURF		RL:	AHD
		vation and S					Material description and profile information	04419	52 111	DATU		d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		SM	TOPSOIL: Silty SAND, fine to medium grai grey/black, some roots	ned, dark	M				TOPSOIL
	1/⊲ 1/8/2023	1.20m ES 1.40m 1.70m ES 1.90m 2.30m				SP	SAND: Fine to medium grained, pale grey/ brown						AEOLIAN
		ES 2.50m		2.5			2.50m Hole Terminated at 2.50 m due to collapse						
<u>Wat</u> ▼	— (Dat Wat Wat I Wat I Wat I Gat La Cha tra	ter Level te and time s ter Inflow ter Outflow anges radational or ansitional stra efinitive or dis	ata	Notes, Sai U ₅₀ CBR E ASS B Field Test PID DCP(x-y)	50mm Bulk s Enviro Acid S Bulk S S Photoi	Diame ample f nmenta sulfate \$ ample onisatio	ter tube sample or CBR testing I sample Soil Sample on detector reading (ppm) strometer test (test depth interval shown)	Consis VS S F St VSt H Fb Densit	Very Soft Soft Firm Stiff Very Stiff Hard Friable	f V L	2: 50 10 20 20 20 20 20 20 20 20 20 20 20 20 20	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400 400 	D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit Density Index <15% Density Index 15 - 35%

				E	ENGI	NEE	RING LOG - TEST PIT			т	EST		10: TP11
		REGION/ GEOTEC		a c	LIENT	:	Allam Property Group			P	AGE	E:	1 of 1
_		SOLUTIO			ROJE	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
				S	SITE LO	CATI	DN: 82 Chapmans Road, Tuncurry			L	OGO	GED B	BY: WW
				Т	EST L	OCAT	ION: Refer to Figure 1			C	ATE		1/8/23
		IENT TYP					nm Toothed Bucket EASTING:	451156		SURF		RL:	
				2.0 m	W	IDTH:	1.0 m NORTHING:	6441899	9 m l	DATU	1		AHD
	Excav	/ation and S	ampling	3		z	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor components		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш						SM	TOPSOIL: Silty SAND, fine to medium grain grey/black, some roots	ied, dark	м				TOPSOIL
						 	0.20m		-				
						. 5P	SAND: Fine to medium grained, grey/paie g	rey					
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				0.5		}							
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						•							
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	33			1.0_		ł							
	1/8/2023												
	1	1.20m				ł							
		ES				-							
		1.40m											
				1.5		}							
		1.70m	-										
		ES											
		1.90m	-			•							
				2.0									
]							
						}							
		2.30m	-										
		ES				ł							
		2.50m		2.5		•	2.50m						
							Hole Terminated at 2.50 m due to collapse						
				.									
	END:		L	Notes, Sa	mnlee ar	d Toetr		Consiste				CS (kPa	Moisture Condition
<u>Wate</u>								VS V	/ery Soft	t	<'	25	D Dry
Ŧ		ter Level te and time s	shown)	U₅₀ CBR	Bulk s	ample	ter tube sample or CBR testing	FF	Soft Firm		50	5 - 50 0 - 100	M Moist W Wet
►	Wat	ter Inflow	mowi1)	E ASS	Acid S	Sulfate S	l sample coil Sample	۷St ۱	Stiff /ery Stiff		20	00 - 200 00 - 400	
€ Strat	Wat taCha	ter Outflow anges		В	Bulk S	Sample			Hard ⁻riable		>4	400	
	G	radational or		Field Test PID	_	ionisatio	n detector reading (ppm)	<u>Density</u>	V L		ery Lo oose	oose	Density Index <15% Density Index 15 - 35%
	De	ansitional str efinitive or di		DCP(x-y)	Dynar	nic pen	etrometer test (test depth interval shown) meter test (UCS kPa)			D N		n Dense	
	st	rata change		115	nanu	- eneuro					ense ery De	ense	Density Index 65 - 85% Density Index 85 - 100%

				E	ENGI	NEE	RING LOG - TEST PIT			т	EST		IO: TP12
1. 1.		REGION/ GEOTEC			LIENT		Allam Property Group			F	AGE	E:	1 of 1
_		SOLUTIO			PROJE	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
				S	SITE LO	CATI	ON: 82 Chapmans Road, Tuncurry			L	OGO	GED B	SY: WW
				٦	EST L	OCAT	ION: Refer to Figure 1			C	ATE	:	1/8/23
							mm Toothed Bucket EASTING:	451126		SURF		RL:	
		IT LENGT		2.0 m	W	IDTH:	1.0 m NORTHING:	6441818	3 m I	DATU	1	d Toot	AHD
	Exca	/ation and S	sampiinį	1		z	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш						SM	TOPSOIL: Silty SAND, fine to medium grain grey/black, some roots	ned, dark	м				TOPSOIL
							0.20m		-				
						SP	SAND: Fine to coarse grained, grey/pale gr	ey					AEOLIAN
						ł							
				0.5									
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]								
	~			1.0]								
	1/8/2023				1	-							
	1/8	1.20m				ł							
	<u> </u>	1.2011											
		ES				{							
		1.40m											
				1.5		}							
		1 70m											
		1.70m				•							
		ES 1.90m]	ł							
				2.0		ł							
					1	ł							
					1]							
		2.30m			1	1							
		2.3011	1			1							
		ES 2 50m		2.5	····	!	2 50m						
		2.50m		2.5	<u></u>	•	2.50m Hole Terminated at 2.50 m				-		
					1		due to collapse						
					1								
					-								
					1								
	END:	1	-	Notes, Sa	mples ar	nd Tests		Consiste		<u>ا</u> ـــــــ		 CS (kPa 25	
Wat	_	ter Level		U ₅₀			ter tube sample	S S	/ery Soft Soft 	L	25	5 - 50	M Moist
	(Dat	te and time s	shown)	CBR E	Enviro	onmenta	or CBR testing I sample	St S	Firm Stiff		10) - 100)0 - 200	- F
		ter Inflow ter Outflow		ASS B		Sulfate S Sample	Soil Sample	1	/ery Stiff -lard			00 - 400 400	W _L Liquid Limit
<u>Stra</u>	ta Cha	-		Field Tes				1	riable V	V	ery Lo		Density Index <15%
	 tra	radational or ansitional str	ata	PID DCP(x-y)	Photo		on detector reading (ppm) etrometer test (test depth interval shown)		L M	L	oose	n Dense	Density Index 15 - 35%
		efinitive or di rata change	stict	HP	-		meter test (UCS kPa)		D	D	ense		Density Index 65 - 85%
		5-							VE) V	ery D	ense	Density Index 85 - 100%

		DESIGN		E	ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	io: TP13
		REGION/	HNIC/		CLIENT	:	Allam Property Group			P	PAGE	Ξ:	1 of 1
		SOLUTIO			PROJEC	CT NA	ME: Proposed MHE			J	OB	NO:	RGS03357.1
					SITE LO					L	.OG(GED B	SY: WW
				1	EST L	OCAT	ION: Refer to Figure 1			C	DATE	:	1/8/23
		IENT TYP		6T Ex 2.0 m		- 600 IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	45107		SURF. DATU		RL:	AHD
		vation and S				חושו.	Material description and profile information	044100		DATO		d Test	AND
	Exca			9		z					FIEI		
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш						SM	TOPSOIL: Silty SAND, fine to medium grai grey/black, some roots	ned, dark	м				TOPSOIL
					<u>K</u>		<u>0.20m</u>						
						SP	SAND: Fine to medium grained, pale grey/g	grey					AEOLIAN
				0.5									
						1							
]								
					1								
				1.0									
	1/8/2023			1.0	1								
					- 	ł							
	<u> </u>	1.20m	-		-								
		ES				ł							
		1.40m	-		-								
				1.5	 	ł							
						•							
		1.70m	-		-								
		ES			+								
		1.90m	-		-								
				2.0	-	1							
]							
]							
		2.30m]							
		ES				ł							
		2.50m		2.5			2.50m						
							Hole Terminated at 2.50 m due to collapse						
					1		·						
					1								
LEG	END:			Notes, Sa	amples an	d Tests		Consist	ency		U	CS (kPa) Moisture Condition
Wate	er			U ₅₀			ter tube sample	VS	Very Soft Soft	t	<	25 5 - 50	D Dry M Moist
Ŧ		ter Level te and time s	hown)	CBR	Bulk s	ample	or CBR testing	F	Firm		50	0 - 100	W Wet
►	Wa	ter Inflow		E ASS	Acid S	Sulfate S	l sample Soil Sample	VSt	Stiff Very Stiff	F	20	00 - 200 00 - 400	
		ter Outflow anges		В	Bulk S	Sample		1	Hard Friable		>/	400	
<u>ora</u>	G	radational or		Field Tes PID		ionieoti	n detector reading (nom)	Density	V		ery Lo	oose	Density Index <15%
		ansitional stra efinitive or di		DCP(x-y)	Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown)		L Mi	D N		n Dense	
	st	rata change		HP	Hand	Penetro	meter test (UCS kPa)		D VE		ense ery D	ense	Density Index 65 - 85% Density Index 85 - 100%

	-	DEOLO			ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	io: TP14
		REGION/ GEOTEC	HNIC/		CLIENT	:	Allam Property Group			P	PAGE	Ξ:	1 of 1
		SOLUTIO			PROJE	CT NA	ME: Proposed MHE			J	OB	NO:	RGS03357.1
					SITE LO					L	.OG(GED B	BY: WW
				-	TEST L	OCAT	ION: Refer to Figure 1			C	DATE	:	1/8/23
		IENT TYP		6T Ex 2.0 m		- 600 IDTH:	mm Toothed Bucket EASTING: 1.0 m NORTHING:	45107		SURF. DATU		RL:	AHD
		vation and S			vv		Material description and profile information	044109	υm	DATU		d Test	
	Exca	vation and S	sampiin	y I		z	Material description and prolife information				Fiel		
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш					-	SM	TOPSOIL: Silty SAND, fine to medium grai grey/black, some roots	ned, dark	м				TOPSOIL
					<u>K</u>	↓ ↓	0.20m						AEOLIAN
						SP	SAND: Fine to medium grained, pale grey/	grey					AEOLIAN
						-							
				0.5		!							
]							
]							
]]							
				1.0]								
	1/8/2023			1.0	 	:							
		4.00				Į							
	<u> </u>	1.20m	-		-	:							
		ES			-	ł							
		1.40m			-								
				1.5		ł							
						•							
		1.70m			-								
		ES			-	1							
		1.90m	-		-[::	!							
				2.0	4]							
					_]							
						}							
		2.30m			<u> </u>								
		ES				ļ							
		2.50m		2.5		· •	2.50m						
					_		Hole Terminated at 2.50 m due to collapse						
]								
LEG	END:			Notes, Sa	amples ar	nd Tests	<u> </u>	Consist	ency		<u> </u>	CS (kPa) Moisture Condition
Wate	_			U ₅₀			- ter tube sample	VS	Very Sof Soft	t		25 5 - 50	D Dry M Moist
₹		ter Level te and time s	shown)	CBR E	Bulk s	sample	for CBR testing al sample	F	Firm Stiff		50) - 100) - 200	W Wet
►	Wa	ter Inflow	,	ASS	Acid S	Sulfate S	a sample Soil Sample	VSt	Very Stif	f	20	00 - 400	
 <u>Stra</u> t		ter Outflow anges		В	Bulk S	Sample			Hard Friable			400	
	G	radational or		Field Tes PID		ionisatio	on detector reading (ppm)	Density	V L		ery Lo oose	oose	Density Index <15% Density Index 15 - 35%
	D	ansitional stra efinitive or di		DCP(x-y) HP	Dynar	nic pen	etrometer test (test depth interval shown) ometer test (UCS kPa)		MI D	D N		n Dense	
	st	trata change		nr.	nand	renetro			V		ense ery D	ense	Density Index 65 - 85% Density Index 85 - 100%

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				E	ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	io: TP16
5		REGION/ GEOTEC	HNICA	L C	LIENT	:	Allam Property Group			P	AGE	:	1 of 1
_		SOLUTIO			PROJE	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
					SITE LO					L	OGO	GED B	
				Т	EST L	OCAT	ION: Refer to Figure 1			C	ATE	:	1/8/23
		IENT TYP IT LENGT		6T Ex 2.0 m		- 600 IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	451120		SURF. DATU		RL:	AHD
		vation and S		-			Material description and profile information	044130			1	d Test	
				,		Z				~			
METHOD	WATER	SAMPLES	RL (Not measure	(m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш						SM	TOPSOIL: Silty SAND, fine to medium grain grey/black, some roots	ned, dark	м				TOPSOIL
					<u>K</u>	• •	0.20m		_				
						SP	SAND: Fine to medium grained, pale grey/g	irey					AEOLIAN
						:							
				0.5		•							
]							
]							
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	~			1.0]	ł							
	1/8/2023			_	 								
	1/8	1.20m		-		ł							
	<u> </u>	1.2011				•							
		ES				ł							
		1.40m											
				1.5									
		. =0				•							
		1.70m	-			•							
		ES 1.90m		-		ł							
		1.0011	-	2.0	1	•							
				2.0		ł							
		0.00			1	ł							
		2.30m	1			•							
		ES				4							
		2.50m		2.5	<u> </u>		Hole Terminated at 2.50 m				-		
					1		due to collapse						
					-								
					-								
					-								
LEG	END:		L	Notes, Sa	mples ar	d Tests		Consiste				CS (kPa	
<u>Wat</u>	_	ter Loval		U ₅₀	50mm	n Diame	ter tube sample	1	/ery Soft Soft	t		25 5 - 50	D Dry M Moist
*		ter Level te and time s	shown)	CBR E	Bulk s	ample	or CBR testing I sample	1	Firm Stiff) - 100)0 - 200	W Wet W _p Plastic Limit
		ter Inflow ter Outflow		ASS B	Acid S		oil Sample	VSt V	/ery Stiff Hard		20	00 - 400 400	
<u>Stra</u>	ta Cha					sample		Fb F	riable				Density is days of 5%
		radational or ansitional str		PID	Photo		n detector reading (ppm)	<u>Density</u>	V L	L	ery Lo oose		Density Index <15% Density Index 15 - 35%
	D	efinitive or di rata change		DCP(x-y) HP	-		etrometer test (test depth interval shown) meter test (UCS kPa)		MI D	D	lediun ense	n Dense	e Density Index 35 - 65% Density Index 65 - 85%
	ગ	.a.a onanye							VE) V	ery D	ense	Density Index 85 - 100%

				E	ENGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	IO: TP17
		REGION/ GEOTEC		~	LIENT		Allam Property Group			P	PAGE	≣:	1 of 1
/		SOLUTIO			ROJE	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
				S	ITE LO	CATI	ON: 82 Chapmans Road, Tuncurry			L	.OGG	GED B	Y: WW
				т	EST L	OCAT	ION: Refer to Figure 1			۵	DATE	:	1/8/23
		MENT TYP					mm Toothed Bucket EASTING:	45105	50 m	SURF	ACE	RL:	
TE		IT LENGT		2.0 m	w	IDTH:		644194	45 m	DATU	-		AHD
	Exca	vation and S	Sampline	g		7	Material description and profile information			1	Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		SM	TOPSOIL: Silty SAND, fine to medium grai grey/black, some roots	ned, dark	W				TOPSOIL
		0.30m		-		SP	SAND: Fine to medium grained, pale grey/	 grey					AEOLIAN
		ES 0.50m		0.5									
		<u>0.80m</u>		-									
		ES 1.00m		1.0									
	1/8/2023	1.0011	-	1.0									
	1/8	-		-									
				1.5									
		1.80m		-									
		ES		-									
	1	2.00m		2.0			2.00m Hole Terminated at 2.00 m			+			
					-		due to collapse						
				2.5									
					-								
				-	-								
LEC	GEND:			Notes, Sa	mples an	d Tests	2	Consis	tency			CS (kPa) Moisture Condition
	<u>ter</u> Wa (Da - Wa € Wa	iter Level ite and time s iter Inflow iter Outflow <u>anges</u>	shown)	U₅₀ CBR E ASS B	50mm Bulk s Enviro Acid S	Diame ample f	- ter tube sample for CBR testing Il sample Soil Sample	VS S F St VSt H Fb	Very Sof Soft Firm Stiff Very Stif Hard Friable		-29 29 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
	G tr D	Gradational or cansitional stra Definitive or di trata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	L L MI D VI	L D M D	'ery Lo oose lediur)ense 'ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

	-	REGION	<u></u>				RING LOG - TEST PIT					PIT N	
		GEOTEC	HNIC/	4L			Allam Property Group				PAGE		1 of 1
		SOLUTIO	JN2		ROJEC		•				OBI		RGS03357.1
							ON: 82 Chapmans Road, Tuncurry ION: Refer to Figure 1				OGC	GED E =.	3Y: WW 1/8/23
									_				1/0/25
		IENT TYP IT LENGT		6T Ex 2.0 m		- 600) IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	45103 644190		SURF. DATU		RL:	AHD
		ation and S					Material description and profile information	000				d Test	
						NO				≿			
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle s	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		SC	TOPSOIL: Clayey SAND, fine to medium g dark grey/black, clay, low plasticity, some r	rained, oots	М				TOPSOIL
		0.30m	-	-		SP	SAND: Fine to medium grained, grey/pale g	 grey					AEOLIAN — — — — — — — —
		ES 0.50m	-	- 0.5_									
				-									
		0.80m		-									
	1/8/2023	ES 1.00m		1.0_									
	1/8/			-									
		1.30m ES		-									
		1.50m		1.5									
		<u>1.80m</u>		-									
		ES 2.00m		2.0									
		2.30m	-										
		ES 2.50m		2.5			2.50m						
				-	-		Hole Terminated at 2.50 m due to collapse						
LEG	SEND:			Notes, Sa	mples an	d Tests		Consiste	ency		<u> </u>	CS (kPa	Moisture Condition
<u>Wat</u> ▼	er Wat (Dat - Wat Wat		shown)	U ₅₀ CBR E ASS B	50mm Bulk s Enviro Acid S	Diame ample f	ter tube sample or CBR testing I sample toil Sample	VS S F St VSt H	Very Soft Soft Firm Stiff Very Stiff Hard Friable		<: 2! 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
	 Water Outflow ata Changes Gradational or transitional strata Definitive or distict strata change 			Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>	V L D VE	L D N D	ery Lo oose lediur ense ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%
		REGION		~			RING LOG - TEST PIT Allam Property Group				EST	PIT N	1 of 1
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/		GEOTEC SOLUTIO		P		T NA	ME: Proposed MHE			J	OBI		RGS03357.1
				т	EST L	CAT	ION: Refer to Figure 1				ATE		1/8/23
EQ	UIPN	IENT TYP	E:	6T Exc	cavator	- 600	mm Toothed Bucket EASTING:	45101	7 m 🖇	SURF	ACE	RL:	
		IT LENGT		2.0 m	W	DTH:	1.0 m NORTHING:	644182	6 m	DATU			AHD
	Exca	vation and S	Sampling T			7	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		SC	TOPSOIL: Clayey SAND, fine to medium g dark grey/black, some roots	rained,	W				TOPSOIL
		0.30m	-	-		SP	SAND: Fine to medium grained, pale grey/g	 grey	-				AEOLIAN
		ES 0.50m	-	0.5_									
				-									
		0.80m	-										
	1/8/2023	ES 1.00m	-	- 1.0_ -									
	<u> </u>	1.30m	-	-									
		ES 1.50m	-	1.5									
		1.80m	-	-									
		ES 2.00m		2.0			2.00m						
				-	-		Hole Terminated at 2.00 m due to collapse						
				-									
				2.5	-								
				-	-								
LEG	END:			Notes, Sa	mples an	<u>d Test</u> s		Consiste	ency		<u>_</u>	CS (kPa) Moisture Condition
	Wai (Dai Wai	ter Level te and time s ter Inflow ter Outflow	hown)	U₅₀ CBR E ASS B	50mm Bulk s Enviro Acid S	Diame ample f nmenta	ter tube sample or CBR testing I sample Soil Sample	VS S F St VSt H	Very Soft Soft Firm Stiff Very Stiff Hard		25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	
	tra D	anges radational or ansitional stra efinitive or dis rata change	ata	Field Test PID DCP(x-y) HP	Photoi Dynan	nic pen	on detector reading (ppm) trometer test (test depth interval shown) meter test (UCS kPa)	Density	Friable V L MI D VE	L D N D	ery Lo oose lediur ense ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

				E	INGI	NEE	RING LOG - TEST PIT			т	EST		IO: TP20
		REGIONA GEOTECI		~			Allam Property Group			P	AGE	E:	1 of 1
_		SOLUTIO	NS		ROJEC	T NA	ME: Proposed MHE			J	ОΒΙ	NO:	RGS03357.1
				s		CATI	ON: 82 Chapmans Road, Tuncurry			L	OGO	GED B	SY: WW
				т	EST L	OCAT	ION: Refer to Figure 1			D	ATE	:	1/8/23
		IENT TYP					nm Toothed Bucket EASTING:	45097		SURF	ACE	RL:	
		IT LENGT		2.0 m	W	IDTH:	1.0 m NORTHING: 6	644180)1 m l	DATU	-		AHD
	Exca\	/ation and S	ampling			z	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/ characteristics,colour,minor components	particle	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		SC	TOPSOIL: Clayey SAND, fine to medium gra dark grey/black, clay, low plasticity, some roc		W				TOPSOIL
		0.30m		-		SC	Clayey SAND: Fine to medium grained, low plasticity, pale grey/grey						
		ES 0.50m		- 0. <u>5</u>									
				-		SP	SAND: Fine to medium grained, pale grey/gr	ey					
	023	0.80m		-									
	1/8/2023	ES		-									
	<u> </u>	1.00m		1.0									
		1.30m		-									
		ES		-									
		1.50m	-	1.5									
		1.80m	-	-									
		ES		-									
		2.00m		2.0			2.00m		_				
				-			Hole Terminated at 2.00 m due to collapse						
				-									
				2.5_									
				-									
				-	-								
	END:	I		Notes, Sa	mples an	d Tests		Consist			_	CS (kPa	
<u>Wate</u>	— Wat (Dat	ter Level te and time s	hown)	U₅₀ CBR E	Bulk s Enviro	ample t nmenta	ter tube sample or CBR testing I sample	VS S F St	Very Soft Soft Firm Stiff		25 50 10	25 5 - 50 0 - 100 00 - 200	F
		ter Inflow ter Outflow		ASS B	Acid S Bulk S		oil Sample	VSt H	Very Stiff Hard	f		00 - 400 400	W _L Liquid Limit
<u>Strat</u>	ta Cha G tra		ata	Field Test PID DCP(x-y)	<u>s</u> Photoi Dynan	onisatio	n detector reading (ppm) trometer test (test depth interval shown)	Fb Density	Friable V L MI	Lo D N	ery Lo bose lediun		,
	st	rata change		HP	Hand	Penetro	meter test (UCS kPa)		D VE		ense ery D	ense	Density Index 65 - 85% Density Index 85 - 100%

		REGION		~			RING LOG - TEST PIT Allam Property Group				EST	PIT N	10: TP21
2		GEOTEC SOLUTIO		P		CT NA	ME: Proposed MHE			J	OB I		RGS03357.1
							ION: Refer to Figure 1						1/8/23
FO		IENT TYP)E·				mm Toothed Bucket EASTING:	4510	17 m	SURF			
		IT LENGT		2.0 m		IDTH:	1.0 m NORTHING:			DATU			AHD
	Excav	ation and S	Sampling	9			Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		SC	TOPSOIL: Clayey SAND, fine to medium g dark grey/black, clay, low plasticity, some r	rained, oots	W				TOPSOIL
		0.30m		-		SP	SAND: Fine to medium grained, grey/pale g moderate sulfur smell	grey,					AEOLIAN
		ES		-									
		0.50m	-	0.5_									
				-									
		0.00		-									
		0.80m	1	-									
	~	ES 1.00m		1.0									
	1/8/2023		1										
	18												
		1.30m		-									
		ES		-									
		1.50m	-	1.5_									
				-									
		1.80m		-									
				-									
		ES 2.00m		2.0			2.00m						
				-	-		Hole Terminated at 2.00 m due to collapse						
				-	-								
				-	-						1		
				-	-								
				2.5_	-								
				-	-						1		
				-	-						1		
				-									
								-					
Wate	— Wat (Dat	er Level te and time s	shown)	Notes, Sar U₅₀ CBR E	50mm Bulk s Enviro	Diame ample t nmenta	ter tube sample or CBR testing I sample	Consis VS S F St	Very Sof Soft Firm Stiff		<: 2! 50 10	<u>CS (kPa</u> 25 5 - 50 0 - 100 00 - 200	D Dry M Moist W Wet W _p Plastic Limit
	Wat	ter Inflow ter Outflow		ASS B		Sulfate S Sample	Soil Sample	VSt H	Very Stif Hard	t		00 - 400 400	W _L Liquid Limit
<u>Strat</u>	 tra De	inges radational or ansitional stra efinitive or di rata change	ata	Field Test PID DCP(x-y) HP	Photoi Dynan	nic pen	on detector reading (ppm) strometer test (test depth interval shown) meter test (UCS kPa)	Fb Density	Friable V L M D	L D N	'ery Lo oose lediur Iense	oose n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85%

		REGION	AL.				RING LOG - TEST PIT					PIT N	
		GEOTEC	HNICA	L			Allam Property Group				PAGE		1 of 1
_		SOLUTIO	INS		ROJEC		•				IOB		RGS03357.1
					ITE LC							GED B -	
				Т	EST L	OCAT	ION: Refer to Figure 1				DATE	:	1/8/23
		IENT TYP IT LENGT		6T Exc 2.0 m		- 600 IDTH:	mm Toothed Bucket EASTING: 1.0 m NORTHING:	45099 644192		SURF. DATU		RL:	AHD
	Exca	ation and S	ampling				Material description and profile information				Fiel	ld Test	
METHOD	WATER	SAMPLES	RL	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	/M		(Not measured)		GR GR	CLASSI		.5	WOI	CONS	Tes	Å	
Ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, clay, some roots		м				TOPSOIL
		0.30m		-		SC	0.20m Clayey SAND: Fine to coarse grained, grey/brown-grey, clay, low plasticity, moder						ALLUVIUM — — — — — — — — — — — — — — — — — — —
						- - -	smell						
		ES 0.50m		0.5									
				-									
		0.80m		-		SP	0.70m SAND: Fine to medium grained, pale grey/g	 grey					
				-									
		ES		-		ł							
	2023	1.00m	-	1.0_									
	1/8/2023			-									
	<u> </u>			-									
		1.30m	-	-									
		ES		-									
		1.50m		1.5									
				-									
		1.80m		-									
		1.80m		-									
		ES		-									
		2.00m		2.0			2.00m Hole Terminated at 2.00 m						
					-		due to collapse						
				-									
				-									
				2.5									
				-									
				-									
				-									
LEG	END:			Notes, Sar	mples an	d Tests		Consist	tencv		L u	CS (kPa	Moisture Condition
Wate								VS	Very Soft	t	<	25	D Dry
Ŧ		er Level	hours	U₅₀ CBR	Bulk s	ample	ter tube sample or CBR testing	S F	Soft Firm		5	5 - 50 0 - 100	M Moist W Wet
►		te and time s ter Inflow		E ASS			l sample Soil Sample	St VSt	Stiff Very Stiff	f		00 - 200 00 - 400	F F
		ter Outflow		В		Sample		H Fb	Hard Friable			400	
<u>Stra</u>	ta Cha G	inges radational or	!	Field Test	_			Density	v v		/ery Lo	oose	Density Index <15%
	tra	ansitional stra efinitive or dis		PID DCP(x-y)			on detector reading (ppm) etrometer test (test depth interval shown)		L ME		oose Iediur	n Dense	Density Index 15 - 35% Density Index 35 - 65%
	- 0	rata change		HP	-		meter test (UCS kPa)		D	D	ense		Density Index 65 - 85%

				E	INGI	NEE	RING LOG - TEST PIT			т	EST	PIT N	io: TP23
		REGIONA GEOTEC			LIENT	:	Allam Property Group			P	PAGE	:	1 of 1
_		SOLUTIO			ROJE	CT NA	ME: Proposed MHE			J	ОΒΙ	NO:	RGS03357.1
				s	ITE LO	CATI	ON: 82 Chapmans Road, Tuncurry			L	.OGG	GED B	Y: WW
				т	EST L	OCAT	ION: Refer to Figure 1			۵	ATE	:	1/8/23
EQ	UIPN	IENT TYP	E:	6T Exc	cavator	- 600	mm Toothed Bucket EASTING:	451008	8 m 🖇	SURF	ACE	RL:	
		IT LENGT		2.0 m	W	IDTH:	1.0 m NORTHING:	6441998	8 m	DATU	-		AHD
	Exca	vation and S	Samplinę T	3		7	Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle is	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, some fine to medium grained, dark grey/black, so	sand, me roots	М				TOPSOIL
		0.30m		-		SC	Clayey SAND: Fine to coarse grained, grey brown, clay, low plasticity	 y/pale	-				ALLUVIUM
		ES 0.50m	-	- 0.5_		•							
				-		-							
		0.80m	-	-		SP	SAND: Fine to coarse grained, pale grey/gr		-				
	1/8/2023	ES 1.00m		- 1. <u>0</u>									
	⊲ 1/8/2			-		•							
		1.30m ES	_	-		• • •							
		1.50m		1.5_		•							
		1.80m		-		•							
		ES		-		•							
		2.00m	-	2.0									
						•	Hole Terminated at 2.20 m						
				-	-		due to collapse						
				2.5	-								
				-	-								
				-	-								
LEG	END:			Notes, Sa	mples an	d Tests		Consiste				CS (kPa	
	Wa (Da Wa	ter Level te and time s ter Inflow ter Outflow anges	shown)	U₅₀ CBR E ASS B	Bulk s Enviro Acid S	ample f	ter tube sample or CBR testing I sample Soil Sample	S F St VSt H	Very Soft Soft Firm Stiff Very Stiff Hard Friable		25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	
	G tra D	radational or ansitional stra efinitive or dia rata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>	V L MI D VI	L D N D	ery Lo oose lediur ense ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION/ GEOTEC	HNICA			:	RING LOG - TEST PIT Allam Property Group ME: Proposed MHE			P	AGE		1 of 1
		JULUIIU	5112		ROJEC						OBI	NO: GED B	RGS03357.1 IY: WW
							ION: Refer to Figure 1						1/8/23
F0		IENT TYP	с.				mm Toothed Bucket EASTING:	450989		SURF			1/0/20
		IT LENGT		2.0 m		- 600 IDTH:	1.0 m NORTHING:			DATU		RL:	AHD
	Exca	vation and S	Sampling	9			Material description and profile information					d Test	
				-		N				X			
METHOD	WATER	SAMPLES	RL (Not measure	d) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/brown, some sand, fine to medium gra some roots	ined,	М				TOPSOIL
		0.30m	_	-		SC	Clayey SAND: Low plasticity, pale grey/pa	 le brown					
		ES 0.50m	-	0.5_	- · · · -								
				-		SP	SAND: Fine to medium grained, pale grey/	 grey	_				
		0.80m	-	-									
	1/8/2023	ES 1.00m		1.0_									
	⊲ 1/8/			-		•							
		1.30m		-									
		ES 1.50m	_	- 1.5_									
				-									
		1.80m ES		-									
		2.00m		2.0			2.00m						
				-	-		Hole Terminated at 2.00 m due to collapse						
				2.5_	-								
				-	-								
LEG	END:			Notes, Sa	mples an	nd Tests		Consister				CS (kPa) Moisture Condition
	er Wa (Da ∙Wa IWa	te and time s ter Inflow ter Outflow	shown)	U ₅₀ CBR E ASS B	50mm Bulk s Enviro Acid S	n Diame ample f	ter tube sample for CBR testing I sample Soil Sample	VS V S S F F St S VSt V H H	ery Soft oft irm tiff ery Stiff ard riable		<2 25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
	G tra D	(Date and time shown) Water Inflow			Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	V L MC D VC	L D N D	ery Lo bose lediun ense ery De	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION	AL				RING LOG - TEST PIT					PIT N	
		GEOTEC SOLUTIO	HNICA	NL	LIENT		Allam Property Group ME: Proposed MHE						1 of 1
		SULUTIO	JN3		ITE LO								RGS03357.1 IY: WW
							ION: Refer to Figure 1				DATE	GED B =.	1/8/23
			_										170/23
		/IENT TYP 'IT LENGT		61 Exc 2.0 m		- 600 IDTH:	mm Toothed Bucket EASTING: 1.0 m NORTHING:	450973 6442019		SURF. DATU		RL:	AHD
		vation and S		1			Material description and profile information			_		d Test	
						NO				×			
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grain roots	ned, some	М				TOPSOIL
		0.30m		-		SC	Clayey SAND: Fine to coarse grained, pale grey/pale brown, clay, low plasticity						
		ES 0.50m	-	0.5	- · · · -								
				-		SP	SAND: Fine to coarse grained, pale grey/gr	еу					
		<u>0.80m</u>		-		 	0.80m						
	123	ES 1.00m	-	1. <u>0</u>									
	I 1/8/2023			-									
	<u> </u>	1.30m		-									
		ES 1.50m		- 1.5_									
				-									
		<u>1.80m</u>	-	-									
		ES 2.00m		2.0			2.00m						
				-	-		Hole Terminated at 2.00 m due to collapse						
				2.5_	-								
				-	-								
				-	-								
LEC	SEND:			Notes, Sa	mples an	d Tests		Consiste	ncy			CS (kPa	
	Ua (Da Wa Wa	ter Level te and time s ter Inflow ter Outflow	shown)	U₅₀ CBR E ASS B	Bulk s Enviro Acid S	ample i nmenta	ter tube sample or CBR testing i sample Soil Sample	S S F F St S VSt V H F	/ery Soft Soft Stiff /ery Stiff lard Friable		25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	P
<u>ətra</u>	G tr D	anges Gradational or ansitional stra Pefinitive or dia trata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>	V L MI D V	L D M D	'ery Lo oose lediur ense 'ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION		~			RING LOG - TEST PIT Allam Property Group				EST	" PIT N =.	IO: TP26
2		GEOTEC SOLUTIO		AL P	ROJEC	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
							ION: 82 Chapmans Road, Functing				DATE	GED E =.	3 Y: WW 1/8/23
F 0			с.				nm Toothed Bucket EASTING:	45095	6	SURF			1/0/20
		IENT TYP IT LENGT		2.0 m		- 600 IDTH:	1.0 m NORTHING:			DATU		: RL:	AHD
	Exca	vation and S	Samplin	g			Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grai roots	ned, some	W				TOPSOIL
		0.30m				sc	Clayey SAND: Fine to coarse grained, pal	 e					
		ES			-		grey/pale brown, clay, low plasticity						
		0.50m		0.5							1		
				-		ł					1		
		0.80m	-	-	 	1					1		
		ES		-									
	1/8/2023	1.00m	1	1. <u>0</u>		SP	SAND: Fine to coarse grained, pale grey/g				1		
	1/8/2			-							1		
	<u> </u>	1.30m		-		ļ					1		
		1.3011		-									
		ES 1.50m		1.5									
				_]							
		1.80m				ł							
		ES											
		2.00m		2.0		{	2.00m						
					-		Hole Terminated at 2.00 m due to collapse				1		
				-	-						1		
					-						1		
				-	-								
				2.5	-								
				-	-						1		
				-	-						1		
				-	-						1		
				-	1						1		
LEG Wat	END: er		•	Notes, Sa	mples an	d Tests		Consist VS	ency Very Sof	t		1 CS (kPa 25	Moisture Condition D Dry
▼	Wa (Da Wa Wa	te and time s ter Inflow ter Outflow	shown)	U₅₀ CBR E ASS B	Bulk s Enviro Acid S	ample i nmenta	ter tube sample or CBR testing I sample ioil Sample	S F St VSt H	Soft Firm Stiff Very Stiff Hard		25 50 10 20	5 - 50 0 - 100 00 - 200 00 - 400 400	M Moist W Wet W _p Plastic Limit
<u>Stra</u>	(Date and time shown) - Water Inflow Water Outflow ata Changes Gradational or transitional strata			Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Fb Density	Friable V L MI D VE	L D N D	'ery Lo oose lediur ense 'ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION/ GEOTEC	HNICA		LIENT	:	RING LOG - TEST PIT Allam Property Group			P	PAGE		1 of 1
_		SOLUTIO	JNS		ROJE						OB I		RGS03357.1
					ITE LO		ON: 82 Chapmans Road, Tuncurry ION: Refer to Figure 1				.OGQ DATE	GED E =.	3 Y: WW 1/8/23
			_										1/0/23
		IENT TYP IT LENGT		61 Ex 2.0 m		- 600 IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	450951 6441884		SURF. DATU		RL:	AHD
		vation and S					Material description and profile information					d Test	
						N	· ·			7			
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grai roots	ned, some	w				TOPSOIL
		0.30m	-	-		SC	Clayey SAND: Fine to coarse grained, pale grey/pale brown, clay, low plasticity						
		ES 0.50m		0.5	 	- - -							
				-		•							
		0.80m	-	-	····-	SP	0.80m SAND: Fine to coarse grained, pale grey/g		-		1		
		ES 1.00m		- 1.0		5P	SAND: Fine to coarse grained, pale grey/g	rey					
	1/8/2023			-		- - -							
	<u> </u>	1.30m	-	-		•							
		ES 1.50m	_	1.5_		•							
				-		•							
		1.80m	-	-		- - -							
		ES 2.00m		2.0			2.00m						
				-	-		Hole Terminated at 2.00 m due to collapse						
				-	-								
				2.5	-								
				-									
				-									
	Wa (Da Wa	ter Level te and time s ter Inflow ter Outflow	shown)	Notes, Sar U₅0 CBR E ASS B	50mm Bulk s Enviro Acid S	n Diame ample f	ter tube sample or CBR testing I sample Soil Sample	S S F F St S VSt N H H	ncy /ery Soft Soft Firm Stiff /ery Stiff lard Friable		-29 29 50 10 20	<u>CS (kPa</u> 25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
	G tr D	radational or ansitional stra efinitive or dia rata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	V L MI D VE	L D M D	'ery Lo oose Iediur Iense 'ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION		~			RING LOG - TEST PIT					PIT N	
2		GEOTEC Solutio	HNICA	L	ROJEC		Allam Property Group ME: Proposed MHE				Page Iob I		1 of 1 RGS03357.1
				S	ITE LC	CATI	ON: 82 Chapmans Road, Tuncurry			L	.OGG	GED B	BY: WW
				Т	EST L	OCAT	ION: Refer to Figure 1			۵	DATE	:	1/8/23
		IENT TYP IT LENGT		6T Exc 2.0 m		- 600 I DTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	4509 64419		SURF DATU		RL:	AHD
	Exca	vation and S	ampling				Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grai roots	ned, som	w				TOPSOIL
		0.30m	-	-		SC	Clayey SAND: Fine to coarse grained, pale grey/pale brown, clay, low plasticity	— — — - Ə					
		ES 0.50m	-	- 0.5_ -			grey/pare brown, cray, row prasticity						
		0.80m					0.80m						
	123	ES 1.00m		- 1.0_		SP	SAND: Fine to coarse grained, pale grey/g	rey					
	I ⊲ 1/8/2023	1.30m		-									
		ES 1.50m	-	- 1.5_									
		<u>1.80m</u>	-	-									
		ES		-									
		2.00m		2.0			2.00m Hole Terminated at 2.00 m						
				-			due to collapse						
				2.5_	-								
				-									
LEG	END:			Notes, Sa	mples an	d Tests		Consis				CS (kPa	
	Wai (Dai Wai Wai	ter Level te and time s ter Inflow ter Outflow	hown)	U₅₀ CBR E ASS B	Bulk s Enviro Acid S	ample f nmenta	ter tube sample or CBR testing I sample Soil Sample	VS S St VSt H Fb	Very Soft Soft Firm Stiff Very Stiff Hard Friable		25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	P
<u>stra</u>	G tra D	anges radational or ansitional stra efinitive or di rata change	ata	Field Test PID DCP(x-y) HP	Photoi Dynan	nic pen	on detector reading (ppm) trometer test (test depth interval shown) meter test (UCS kPa)	Densit		L D M D	/ery Lo .oose /lediur)ense /ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 65 - 100%

		REGION	AL				RING LOG - TEST PIT					PIT N	
	Ē	GEOTEC	HNIC/	AL.			Allam Property Group				PAGE		1 of 1
		SOLUTIO	JN2		ROJE						OBI		RGS03357.1
					ITE LO							GED B 	
							ION: Refer to Figure 1				DATE		1/8/23
		IENT TYP IT LENGT		6T Exc 2.0 m		- 600) IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	450860 6441886		SURF. DATU		RL:	AHD
	Exca	vation and S	Samplinę	9			Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Е				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grain roots	ned, some	W				TOPSOIL
		0.30m	_	-		sc	Clayey SAND: Fine to medium grained, pa grey/pale brown, clay, low plasticity	 le	-				ALLUVIUM
		ES 0.50m	-	- 0.5_									
				-									
		0.80m		-	-	SP	SAND: Fine to medium grained, pale grey/g	 grey	-				
	023	ES 1.00m		- 1. <u>0</u>									
	I/8/2023			-									
		1.30m		-									
		ES 1.50m	-	- 1.5_									
				-									
		1.80m ES		-									
		2.00m		2.0			2.00m Hole Terminated at 2.00 m						
				-	-		due to collapse						
				2.5_	-								
				-	-								
				-	-								
	END:	1	L	Notes, Sa	mples an	ld Tests		Consiste	 ncy /ery Soff	I		CS (kPa 25) <u>Moisture Condition</u> D Dry
	Wai (Dai Wai Wai	ter Level te and time s ter Inflow ter Outflow	shown)	U₅₀ CBR E ASS B	Bulk s Enviro Acid S	ample f	ter tube sample or CBR testing I sample coil Sample	S S F F St S VSt N H F	Firm Stiff /ery Stiff Hard Friable		25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	M Moist W Wet W _p Plastic Limit
<u>stra</u>	G tra D	anges radational or ansitional stra efinitive or dia trata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	-nable V L MI D VE	L N D	ery Lo oose lediur ense ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION		~			RING LOG - TEST PIT Allam Property Group				EST	' PIT N	IO: TP30
2		GEOTEC Solutio		AL P	ROJE	CT NA	ME: Proposed MHE			J	OBI	NO:	RGS03357.1
					SITE LO		ON: 82 Chapmans Road, TuncurryION: Refer to Figure 1					GED B 	3 Y: WW 1/8/23
											DATE		1/8/23
		IENT TYP IT LENGT		6T Ex 2.0 m		- 600) IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	45089		SURF. DATU		RL:	AHD
		vation and S					Material description and profile information	044133	5111			d Test	
				9		Z				~			
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor component		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grai roots	ned, some	W				TOPSOIL
		0.30m				SC	Clayey SAND: Fine to medium grained, gre brown, clay, low plasticity	ey/pale	-				
		ES					brown, clay, low plasticity						
		0.50m	-	0.5	-	ł							
					=								
		0.80m			-	SP	0.80m		-				
		ES				97	SAND. The to medium grained, pare grey(чсу					
	123	1.00m	-	1.0_]							
	1/8/2023												
	<u> </u>					ł							
		1.30m	-										
		ES		-									
		1.50m	-	1.5									
				-									
						1							
		1.80m											
		ES		-]							
	-	2.00m		2.0			2.00m		_				
					-		Hole Terminated at 2.00 m due to collapse						
					-								
				2.5									
					-								
LEG	END:		L	Notes, Sa	mples an	d Tests		Consiste	encv			CS (kPa	Moisture Condition
<u>Wat</u> ▼	er Wat (Dat - Wat	ter Level te and time s ter Inflow ter Outflow	shown)	U ₅₀ CBR E ASS B	50mm Bulk s Enviro Acid S	i Diame ample f	ter tube sample or CBR testing I sample ioil Sample	VS S F St VSt H	Very Soft Soft Firm Stiff Very Stiff Hard		<: 2! 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
<u>Stra</u>	tra D	anges radational or ansitional stra efinitive or dia rata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Fb Density	Friable V L MI D VE	L D M D	ery Lo oose lediur ense ery D	n Dense	Density Index <15% Density Index 15 - 35% e Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION	AL	~			RING LOG - TEST PIT Allam Property Group				EST	' PIT N =.	IO: TP31
2		GEOTEC Solutio		P	ROJEC	CT NA	ME: Proposed MHE			J	OB I	NO:	RGS03357.1
					ITE LO							GED B 	
							ION: Refer to Figure 1				DATE		1/8/23
		IENT TYP IT LENGT		6T Exc 2.0 m		- 600) IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	45093 644199		SURF. DATU		RL:	AHD
		vation and S					Material description and profile information	044133	55 111 1			d Test	
	Enda					z				>			
METHOD	WATER	SAMPLES	RL (Not measured	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grai roots	ned, som	eW				TOPSOIL
		0.30m		-		SC	Clayey SAND: Fine to medium grained, pa grey/pale brown, clay, low plasticity	lle					ALLUVIUM
		ES 0.50m	-	0.5_			greyipale brown, cray, row prasticity						
		<u>0.80m</u>	-	-			0.80m SAND: Fine to medium grained, pale grey//						
	1/8/2023	ES 1.00m	-	- 1.0_		55	SAND. Fine to medium grained, pare greyn	grey					
	1/8	1.30m	_	-									
		ES 1.50m	-	- 1.5_									
		1.80m	-	-									
		ES		-									
		2.00m		2.0			2.00m Hole Terminated at 2.00 m		_				
				-	-		due to collapse						
				2.5									
				-	-								
LFG	END:			Notes, Sa	mples an	d Tests		Consis	tency			CS (kPa) Moisture Condition
	er Wai (Dai Wai Wai	ter Level te and time s ter Inflow ter Outflow	shown)	U₅ CBR E ASS B	50mm Bulk s Enviro Acid S	Diame ample f	ter tube sample or CBR testing I sample ioil Sample	VS S F St VSt H Fb	Very Soft Soft Firm Stiff Very Stiff Hard Friable		-29 29 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	D Dry M Moist W Wet W _p Plastic Limit
	tra D	anges radational or ansitional stra efinitive or dia rata change	ata	Field Test PID DCP(x-y) HP	Photoi Dynan	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Densit</u> y		L D N D	'ery Lo oose lediur ense 'ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 35 - 85% Density Index 85 - 100%

		REGION		~								PIT N	
2		GEOTEC SOLUTIO	HNIC/	AL.	ROJE		Allam Property Group ME: Proposed MHE				PAGE IOB I		1 of 1 RGS03357.1
												GED E	
							ION: Refer to Figure 1				DATE		1/8/23
EQ	UIPN		E:	6T Exc	cavator	- 600	mm Toothed Bucket EASTING:	45093	88 m - 1	SURF	ACE	RL:	
		IT LENGT		2.0 m		IDTH:	1.0 m NORTHING:			DATU			AHD
	Exca	vation and S	Samplin	9		1	Material description and profile information			1	Fiel	ld Test	
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grai roots	ned, some	W				TOPSOIL
		0.30m			×////	sc	0.25m Clayey SAND: Fine to medium grained, pa grey/pale brown, clay, low plasticity	 le					
		ES		-			grey/pale brown, clay, low plasticity						
		0.50m	-	0.5	+								
				-		SP	SAND: Fine to medium grained, pale brown grey	 n/pale					
		0.80m		-		ł	Colour change to grey/pale grey						
		ES 1.00m		- 1.0		•							
	1/8/2023	1.00111	-	1.0									
	1/8/			-		•							
	<u> </u>	1.30m		-									
				-		ł							
		ES 1.50m		1.5									
						ł							
		1.80m				•							
		ES		-									
	-	2.00m		2.0			2.00m						
				-	-		Hole Terminated at 2.00 m due to collapse				1		
				-	-						1		
				-	-								
				-	-						1		
				2.5	-						1		
				-	-						1		
				-	-						1		
				-	-						1		
				-	-								
	SEND:			Notes, Sa	mples an	d Tests		Consist		۱ ۱		CS (kPa	
	Wa (Da Wa Wa	ter Level te and time s ter Inflow ter Outflow anges	shown)	U₅₀ CBR E ASS B	Bulk s Enviro Acid S	ample f	ter tube sample or CBR testing I sample ioil Sample	VS S F St VSt H Fb	Very Soft Soft Firm Stiff Very Stiff Hard Friable		25 50 10 20	25 5 - 50 0 - 100 00 - 200 00 - 400 400	P
<u> </u>	G tr: D	anges radational or ansitional stra efinitive or dis rata change	ata	Field Test PID DCP(x-y) HP	Photo Dynar	nic pen	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>		L D N D	'ery Lo oose lediur ense 'ery D	n Dense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

		REGION	AL	~			RING LOG - TEST PIT					PIT N	
		GEOTEC	HNIC/	4L	LIENT		Allam Property Group ME: Proposed MHE				PAGE OB I		1 of 1 RGS03357.1
		3010110)N3										
							ION: Refer to Figure 1				OGG ATE	GED B =.	1/8/23
			_						_				1/0/23
		IENT TYP IT LENGT		61 Exo 2.0 m		- 600 IDTH:	nm Toothed Bucket EASTING: 1.0 m NORTHING:	45097 644210		SURF. DATU		RL:	AHD
		ation and S					Material description and profile information	044210				d Test	
				5		Z				~			
METHOD	WATER	SAMPLES	RL (Not measure	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component		MOISTURE	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
Ш				-		CL	TOPSOIL: Silty CLAY, low plasticity, dark grey/black, some sand, fine to medium grain roots	ned, some	W				TOPSOIL
		0.30m		-		SC	Clayey SAND: Fine to medium grained, pa	le	-				
		ES		-			grey/pale brown, clay, low plasticity						
		0.50m	4	0.5	ļ:								
					····-								
				-	[····-								
		0.80m		-		<u> </u>	0.80m						
		ES		-		SP	SAND: Fine to medium grained, pale grey/g	grey					
	3	1.00m		1.0_									
	1/8/2023												
	1/8												
		1.30m											
				-									
		ES 1.50m		- 1.5		}							
		1.5011]							
				-									
		1.00		-		ł							
		1.80m		-									
		ES		-									
		2.00m		2.0			2.00m Hole Terminated at 2.00 m						
				-	-		due to collapse						
				-	-								
				-	-								
				-	-								
				2.5	-								
				-	-								
				-	-								
				-	-								
				-	4								
			<u> </u>	N	<u> </u>								
LEG Wate	END: er			Notes, Sa					Very Soft	t	<	CS (kPa 25	D Dry
	Wat	er Level		U₅₀ CBR			er tube sample or CBR testing		Soft Firm			5 - 50) - 100	M Moist W Wet
-	•	te and time s ter Inflow	shown)	E ASS	Enviro	nmenta	i sample oil Sample	St	Stiff Very Stiff	:	1(00 - 200 00 - 400	W _p Plastic Limit
-	l Wat	ter Outflow		В		Sample	··••-	н	Hard			400	Endana Filling
<u>Strat</u>	ta Cha G	inges radational or	.	Field Test			1	Density	Friable V		ery Lo	oose	Density Index <15%
		ansitional stra efinitive or di		PID DCP(x-y)	Dynar	nic pen	n detector reading (ppm) trometer test (test depth interval shown)		L M	D N		n Dense	
		rata change		HP	Hand	Penetro	meter test (UCS kPa)		D VE		ense ery D	ense	Density Index 65 - 85% Density Index 85 - 100%



Appendix B

Laboratory Test Result Sheets

RESULTS OF ACID SULFATE SOIL ANALYSIS

112 samples supplied by Regional Geotechnical Solutions Pty Ltd on 8/08/2023. Lab Job No. P3902. Analysis requested by Andrew Hills. Your Job: RGS03357.1, Allam Property Group.

44 Bent Street WINGHAM NSW 2429																	Non-tre	ated soil	Non-tre	ated soil
Sample Identification	EAL Lab Code	Texture	Moisture	Content		pH _F a	nd pH _{FOX}		KCI-extract	able sulfur	Potential Sulf	idic Acidity		Actual Acidity	Retaine	d Acidity	Acid Neutralia	sing Capacity	Net Acidity	Lime Calculation
	0000								(S	i _{KCI})	(Chromium Red CF			(Titratable Actual Acidity - TAA)			(A)	VC _{BT})		
			(% moisture of total wet weight)	(g moisture / g of oven dry soil)	рН _Е	pH _{FOX}	pH change	Reaction	(% S _{KCI})	(equiv. mol H */t)	(% S _{or})	(mol H */t)	рН _{ксі}	(mol H */t)	(%S _{NAS})	(mol H */t)	(% CaCO ₃)	(mol H */t)	(mol H */t)	(kg CaCO ₃ /t DW)
Method Info.		**	woigint)	1 ury soli)		(In-house	method S21)				(In-house n	nethod S20)	(In-hoi	use method 16b)		**	(In-house	method S14)	**	**
TP 1 1.2-1.4m	P3902/1	Caaraa	19.1	0.24	5.60	4.12	-1.48	1.000												
TP 1 1.7-1.9m	P3902/1 P3902/2	Coarse Coarse	24.2	0.24	5.22	3.50	-1.40	Low Low												
TP 1 2.3-2.5m	P3902/2	Coarse	17.3	0.32	4.41	2.21	-2.20	Volcanic	0.022	 14	0.146	 91	 4.99	 16					 107	
TP 2 1.2-1.4m	P3902/3	Coarse	17.8	0.21	5.64	3.15	-2.20	Medium	0.022		0.140	91		10						0
TP 2 1.7-1.9m	P3902/4	Coarse	21.0	0.22	4.97	3.13	-2.49	Medium												
TP 2 2.3-2.5m	P3902/5 P3902/6	Coarse	17.4	0.27	4.97	2.48	-2.15	Extreme												
	P3902/6 P3902/7																			
TP 3 1.2-1.4m	P3902/7 P3902/8	Coarse	16.7	0.20	5.07	3.24	-1.83	Medium												
TP 3 1.7-1.9m		Coarse	19.1	0.24	5.76	1.59	-4.17	High												
TP 3 2.3-2.5m	P3902/9	Coarse	17.6	0.21	5.24	1.68	-3.56	Low	0.007	4	0.053	33	5.27	/					40	3
TP 4 1.2-1.4m	P3902/10	Coarse	20.1	0.25	5.92	3.28	-2.64	Medium												
TP 4 1.7-1.9m	P3902/11	Coarse	17.8	0.22	5.00	2.22	-2.78	Volcanic	0.020	12	0.205	128	4.91	16					144	11
TP 4 2.3-2.5m	P3902/12	Coarse	18.6	0.23	5.22	1.27	-3.95	Low												
TP 5 1.2-1.4m	P3902/13	Coarse	20.3	0.25	6.03	4.27	-1.76	Medium												
TP 5 1.7-1.9m	P3902/14	Coarse	20.2	0.25	6.14	4.27	-1.87	Medium												
TP 5 2.3-2.5m	P3902/15	Coarse	16.5	0.20	5.73	2.13	-3.60	Volcanic												
TP 6 1.2-1.4m	P3902/16	Coarse	23.8	0.31	6.10	3.97	-2.13	Medium												
TP 6 1.7-1.9m	P3902/17	Coarse	15.8	0.19	5.12	2.14	-2.98	Extreme												
TP 6 2.3-2.5m	P3902/18	Coarse	16.5	0.20	5.73	2.17	-3.56	Volcanic												
TP 7 1.2-1.4m	P3902/19	Coarse	15.1	0.18	6.18	3.24	-2.94	Medium												
TP 7 1.7-1.9m	P3902/20	Coarse	18.4	0.23	5.74	3.00	-2.74	Medium												
TP 7 2.3-2.5m	P3902/21	Coarse	19.3	0.24	5.75	1.37	-4.38	High	0.009	5	0.080	50	5.11	21					71	5
TP 8 1.2-1.4m	P3902/22	Coarse	23.4	0.31	6.39	3.89	-2.50	Medium												
TP 8 1.7-1.9m	P3902/23	Coarse	19.1	0.24	6.35	1.55	-4.80	High												
TP 8 2.3-2.5m	P3902/24	Coarse	17.9	0.22	5.50	2.18	-3.32	Volcanic												
TP 9 1.2-1.4m	P3902/25	Coarse	24.8	0.33	6.26	3.72	-2.54	Medium												
TP 9 1.7-1.9m	P3902/26	Coarse	16.4	0.20	4.50	2.06	-2.44	Volcanic												
TP 9 2.3-2.5m	P3902/27	Coarse	16.8	0.20	4.69	2.30	-2.39	Extreme												
TP 10 1.2-1.4m	P3902/28	Coarse	21.2	0.27	6.08	2.56	-3.52	Medium												
TP 10 1.7-1.9m	P3902/29	Coarse	16.9	0.20	4.59	2.16	-2.43	Volcanic												
TP 10 2.3-2.5m	P3902/30	Coarse	16.7	0.20	4.59	2.08	-2.51	Volcanic												
TP 11 1.2-1.4m	P3902/31	Coarse	20.5	0.26	6.19	3.30	-2.89	Low												
TP 11 1.7-1.9m	P3902/32	Coarse	16.6	0.20	5.23	2.32	-2.91	Extreme												
TP 11 2.3-2.5m	P3902/32	Coarse	16.9	0.20	5.14	2.32	-2.91	Extreme												
TP 12 1.2-1.4m	P3902/33	Coarse	23.9	0.20	6.22	1.80	-2.80	Medium												
TP 12 1.2-1.4m	P3902/34	Coarse	16.1	0.31	4.74	2.17	-4.42	Volcanic	0.012		0.171	 106	 5.53						 113	
TP 12 2.3-2.5m	P3902/35		15.7	0.19		2.17	-2.57	Volcanic	0.012		0.171	100	0.00	U					113	0
		Coarse	-	-	4.66	-														
TP 13 1.2-1.4m	P3902/37	Coarse	20.0	0.25	5.50	2.22	-3.28	Extreme												
TP 13 1.7-1.9m	P3902/38	Coarse	16.8	0.20	4.83	2.32	-2.51	Extreme												
TP 13 2.3-2.5m	P3902/39	Coarse	17.0	0.21	5.18	2.32	-2.86	Extreme												
TP 14 1.2-1.4m	P3902/40	Coarse	17.0	0.21	6.22	3.92	-2.30	Low												
TP 14 1.7-1.9m	P3902/41	Coarse	18.6	0.23	5.17	2.28	-2.89	Extreme												
TP 14 2.3-2.5m	P3902/42	Coarse	17.8	0.22	5.06	2.21	-2.85	Extreme												
TP 15 1.2-1.4m	P3902/43	Coarse	18.2	0.22	5.38	2.14	-3.24	Volcanic	0.026	16	0.216	135	5.17	13					148	11
TP 15 1.7-1.9m	P3902/44	Coarse	18.7	0.23	5.03	2.21	-2.82	Volcanic												
TP 15 2.3-2.5m	P3902/45	Coarse	18.3	0.22	5.99	3.70	-2.29	Low												

checked: Graham Lancaster Laboratory Manager

RESULTS OF ACID SULFATE SOIL ANALYSIS

112 samples supplied by Regional Geotechnical Solutions Pty Ltd on 8/08/2023. Lab Job No. P3902. Analysis requested by Andrew Hills. Your Job: RGS03357.1, Allam Property Group.

44 Bent Street WINGHAM NSW 2429																	Non-trea	ated soil	Non-tre	ated soil
Sample Identification	EAL Lab Code	Texture	Moisture	Content		pH _F ar	id pH _{FOX}		KCI-extract	table sulfur	Potential Suit	idic Acidity		Actual Acidity	Retained	d Acidity	Acid Neutralis	ing Capacity	Net Acidity	Lime Calculation
	0046						1		(8	hica)	(Chromium Red CF	ucible Sulfur - RS)		(Titratable Actual Acidity - TAA)			(AN	IC _{BT})		
			(% moisture of total wet weight)	(g moisture / g of oven dry soil)	рН _F	pH _{FOX}	pH change	Reaction	(% S _{KCI})	(equiv. mol H */t)	(% S _{or})	(mol H */t)	рН _{ксі}	(mol H */t)	(%S _{NAS})	(mol H ⁺/t)	(% CaCO ₃)	(mol H */t)	(mol H ⁺/t)	(kg CaCO ₃ /t DW)
Method Info.		**	weight)	**		(In-house	method S21)			**	(In-house n	nethod S20)	(In-hou	ise method 16b)			(In-house I	nethod S14)	**	**
TD 46 4 0 4 4m	00000/40	Coores	22.1	0.00	6.04	1.60	4.05	Valaania	0.025	22	0.600	420	E 10	20					449	34
TP 16 1.2-1.4m	P3902/46 P3902/47	Coarse Coarse	22.1 20.1	0.28	6.04	1.69	-4.35	Volcanic Extreme	0.035	22	0.688	429	5.10	20					449	-
TP 16 1.7-1.9m TP 16 2.3-2.5m	P3902/47 P3902/48	Coarse	18.9	0.25 0.23	5.04 5.37	2.28 2.27	-2.76 -3.10	Extreme												
TP 10 2.3-2.5m TP 17 0.8-1.0m	P3902/40	Coarse	17.2	0.23			-3.10	Low												
TP 17 0.8-1.0m TP 17 1.3-1.5m	P3902/49 P3902/50	Coarse	17.2	0.21	6.16 5.09	4.02 2.24	-2.14	Extreme												
		Coarse	17.2	0.21	5.44	2.24	-2.85													
TP 17 1.8-2.0m TP 18 0.8-1.0m	P3902/51 P3902/52	Coarse	17.7	0.22	-	2.35		Low		 9	 0.148	 92							 97	
	P3902/52 P3902/53				4.98		-2.85	Extreme	0.014		0.146	92	5.37	5					97	/
TP 18 1.3-1.5m	P3902/53 P3902/54	Coarse	16.8	0.20	5.36	2.26	-3.10	Extreme Extreme												
TP 18 1.8-2.0m		Coarse	17.2	0.21	5.23	2.27	-2.96													
TP 18 2.3-2.5m	P3902/55	Coarse	18.2	0.22	5.21	2.23	-2.98	Very High												
TP 19 0.8-1.0m	P3902/56	Coarse	18.1	0.22	5.07	2.30	-2.77	Very High												
TP 19 1.3-1.5m	P3902/57	Coarse	18.0	0.22	5.54	2.30	-3.24	Very High												
TP 19 1.8-2.0m	P3902/58	Coarse	17.7	0.22	5.40	2.26	-3.14	Very High												
TP 20 0.8-1.0m	P3902/59	Coarse	17.9	0.22	5.12	2.14	-2.98	Volcanic	0.014	8	0.196	122	5.38	5					127	10
TP 20 1.3-1.5m	P3902/60	Coarse	18.2	0.22	5.25	2.17	-3.08	Volcanic												
TP 20 1.8-2.0m	P3902/61	Coarse	16.6	0.20	6.04	2.29	-3.75	Very High												
TP 21 0.8-1.0m	P3902/62	Coarse	20.1	0.25	5.22	2.12	-3.10	Volcanic												
TP 21 1.3-1.5m	P3902/63	Coarse	18.4	0.23	5.38	2.22	-3.16	Volcanic												
TP 21 1.8-2.0m	P3902/64	Coarse	19.8	0.25	5.21	2.21	-3.00	Very High												
TP 22 0.3-0.5m	P3902/65	Coarse	17.5	0.21	6.38	3.73	-2.65	Low												
TP 22 0.8-1.0m	P3902/66	Coarse	17.5	0.21	5.45	2.23	-3.22	Very High												
TP 22 1.3-1.5m	P3902/67	Coarse	18.1	0.22	5.36	2.20	-3.16	Very High												
TP 22 1.8-2.0m	P3902/68	Medium	16.5	0.20	5.60	2.20	-3.40	Very High												
TP 23 0.3-0.5m	P3902/69	Coarse	19.6	0.24	6.18	4.22	-1.96	Low												
TP 23 0.8-1.0m	P3902/70	Coarse	18.8	0.23	5.25	2.28	-2.97	Volcanic												
TP 23 1.3-1.5m	P3902/71	Coarse	17.6	0.21	5.47	2.22	-3.25	Volcanic	0.012	8	0.152	95	5.57	5					100	8
TP 23 1.8-2.0m	P3902/72	Coarse	17.2	0.21	5.95	2.23	-3.72	Very High												
TP 24 0.8-1.0m	P3902/73	Coarse	16.2	0.19	5.89	2.28	-3.61	Extreme												
TP 24 1.3-1.5m	P3902/74	Coarse	21.6	0.27	5.85	2.27	-3.58	Extreme												
TP 24 1.8-2.0m	P3902/75	Coarse	17.9	0.22	6.48	2.23	-4.25	Extreme												
TP 25 0.8-1.0m	P3902/76	Coarse	18.1	0.22	6.62	2.16	-4.46	Volcanic												
TP 25 1.3-1.5m	P3902/77	Coarse	18.2	0.22	6.31	2.28	-4.03	Extreme												
TP 25 1.8-2.0m	P3902/78	Coarse	16.6	0.20	6.41	2.23	-4.18	Extreme	0.019	12	0.164	102	5.41	5					107	8
TP 26 0.3-0.5m	P3902/79	Coarse	18.8	0.23	6.65	4.02	-2.63	Low												
TP 26 0.8-1.0m	P3902/80	Coarse	20.1	0.25	6.43	3.01	-3.42	Low												
TP 26 1.3-1.5m	P3902/81	Coarse	20.0	0.25	5.41	2.25	-3.16	Extreme												
TP 26 1.8-2.0m	P3902/82	Coarse	18.8	0.23	5.84	2.24	-3.60	Extreme												
TP 27 0.8-1.0m	P3902/83	Coarse	19.2	0.24	5.63	2.34	-3.29	Extreme												
TP 27 1.3-1.5m	P3902/84	Coarse	18.2	0.22	6.08	2.32	-3.76	Extreme												
TP 27 1.8-2.0m	P3902/85	Coarse	17.7	0.22	5.92	2.25	-3.67	Extreme												
TP 28 0.8-1.0m	P3902/86	Coarse	17.8	0.22	6.29	2.23	-4.06	Extreme												
TP 28 1.3-1.5m	P3902/87	Coarse	17.3	0.22	5.18	2.26	-2.92	Extreme		I										
TP 28 1.8-2.0m	P3902/88	Medium	18.1	0.21	6.26	2.20	-4.06	Extreme			1									
TP 29 0.3-0.5m	P3902/89	Coarse	18.9	0.22	6.41	3.06	-3.35	Medium												
TP 29 0.8-1.0m	P3902/90	Coarse	18.5	0.23	6.55	2.78	-3.77	Low												

RESULTS OF ACID SULFATE SOIL ANALYSIS

112 samples supplied by Regional Geotechnical Solutions Pty Ltd on 8/08/2023. Lab Job No. P3902. Analysis requested by Andrew Hills. Your Job: RGS03357.1, Allam Property Group.

44 Bent Street WINGHAM NSW 242	19																Non-trea	ated soil	Non-tre	ated soil
Sample Identification	EAL Lab Code	Texture	Moisture	Content		pH _F ar	nd pH _{FOX}		KCI-extract	able sulfur	Potential Sulf	idic Acidity		Actual Acidity	Retaine	d Acidity	Acid Neutralis	ing Capacity	Net Acidity	Lime Calculation
									(S	ikci)	(Chromium Red CR			(Titratable Actual Acidity - TAA)			(AN	C _{BT})		
			(% moisture of total wet weight)	(g moisture / g of oven dry soli)	pH _F	pH _{FOX}	pH change	Reaction	(% S _{KCI})	(equiv. mol H */t)	(% S _{or})	(mol H */ť)	рН _{ксі}	(mol H */t)	(%S _{NAS})	(mol H ⁺/t)	(% CaCO ₃)	(mol H ⁺ /t)	(mol H ⁺/t)	(kg CaCO₃/t DW
Method Info.		**		**		(In-house	method S21)			**	(In-house m	ethod S20)	(In-hou	ise method 16b)		**	(In-house r	nethod S14)	**	**
TP 29 1.3-1.5m	P3902/91	Coarse	18.9	0.23	5.94	2.23	-3.71	Extreme												
TP 29 1.8-2.0m	P3902/92	Medium	20.4	0.26	6.22	2.35	-3.87	Extreme												
TP 30 0.3-0.5m	P3902/93	Coarse	18.5	0.23	6.50	3.42	-3.08	Low												
TP 30 0.8-1.0m	P3902/94	Coarse	17.6	0.21	6.63	2.81	-3.82	Low												
TP 30 1.3-1.5m	P3902/95	Coarse	17.4	0.21	5.40	2.10	-3.30	Volcanic	0.015	9	0.281	176	5.45	5					181	14
TP 30 1.8-2.0m	P3902/96	Coarse	20.9	0.26	6.50	2.28	-4.22	Extreme												
TP 31 0.8-1.0m	P3902/97	Coarse	19.2	0.24	6.64	2.55	-4.09	Low												
TP 31 1.3-1.5m	P3902/98	Coarse	22.2	0.29	6.36	2.22	-4.14	Extreme												
TP 31 1.8-2.0m	P3902/99	Coarse	19.1	0.24	6.56	2.28	-4.29	Extreme												
TP 32 0.8-1.0m	P3902/100	Coarse	18.0	0.22	6.87	2.99	-3.88	Low												
TP 32 1.3-1.5m	P3902/101	Coarse	16.4	0.20	6.21	2.18	-4.03	Volcanic												
TP 32 1.8-2.0m	P3902/102	Medium	17.0	0.21	6.74	2.19	-4.55	Extreme												
TP 33 0.3-0.5m	P3902/103	Coarse	18.4	0.23	6.39	3.81	-2.58	Low												
TP 33 0.8-1.0m	P3902/104	Coarse	17.2	0.21	5.93	2.15	-3.78	Volcanic	0.027	17	0.251	156	5.10	7					163	12
TP 33 1.3-1.5m	P3902/105	Coarse	18.2	0.22	6.40	2.27	-4.13	Extreme												
TP 33 1.8-2.0m	P3902/106	Coarse	16.7	0.20	6.60	2.38	-4.22	Extreme												
TP 32 0.3-0.5m	P3902/107	Coarse	20.0	0.25	6.91	3.92	-2.99	Low												
TP 22 0.3-0.5m	P3902/108	Coarse	16.6	0.20	6.49	2.76	-3.74	Medium												
TP 24 0.3-0.5m	P3902/109	Medium	17.9	0.22	6.33	3.17	-3.16	Medium	0.002	1	0.005	3	5.67	11					14	1
TP 27 0.3-0.5m	P3902/110	Coarse	18.8	0.23	6.71	3.74	-2.97	Medium												
TP 19 0.3-0.5m	P3902/111	Coarse	16.4	0.20	6.86	3.81	-3.05	Medium	0.001	1	< 0.005	0	5.82	6					6	0
TP 25 0.3-0.5m	P3902/112	Medium	16.8	0.20	6.99	4.34	-2.65	Medium												
																				1

NOTES:

1. All analysis is reported on a dry weight (DW) basis, unless wet weight (WW) is specified.

2. Samples are dried and ground immediately upon arrival (unless supplied dried and ground).

3. Analytical procedures are sourced from Sullivan L, Ward N, Toppler N and Lancaster G. 2018. National acid sulfate soils guidance: national acid sulfate soils guidance: national acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0.

4. The Acid Base Accounting Equation, where Acid Neutralising Capacity has not been corroborated by other data, is Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity (Eq. 3.2; Sullivan et al. 2018 - full reference above).

5. The Acid Base Accounting Equation for post-limed soil materials is Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity - (post treatment Acid Neutralising Capacity - initial Acid Neutralising Capacity) (Eq. 3.3; Sullivan et al. 2018 - full reference above).

While the Acid Neutralising Capacity of a soil material may not be included in the Net Acidity calculation (Note 4), it must be measured to give an Initial Acid Neutralising Capacity if verification testing is planned post-liming.

The Initial Acid Neutralising Capacity must be provided by the client to enable EAL to produce Verification Net Acidity and Liming calculations for post-limed soil materials.

6. The Acid Base Accounting Equation, where Acid Neutralising Capacity has been corroborated by other data, is Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity - Acid Neutralising Capacity (Eq. 3.1; Sullivan et al. 2018 - full reference above).

7. The lime calculation includes a Safety Factor of 1.5 as a safety margin for acid neutralisation (Sullivan et al. 2018). This is only applied to positive values. An increased Safety Factor may be required in some cases.

8. Retained Acidity is required when the pHKCl < 4.5 or where jarosite has been visually observed.

9. A negative Net Acidity result indicates an excess acid neutralising capacity.

10. If insufficient mixing occurs during initial sampling, or during post-liming, or both: the Potential Sulfidic Acidity may be greater in the post-limed sample than in the initial sample; the post-liming Acid Neutralising Capacity may be lower in the post-limed sample than in the initial sample.

11. An acid sulfate soil management plan is triggered by Net Acidity results greater than the texture dependent criterion: coarse texture $\geq 0.03\%$ S or 18 mol H+/t; medium texture $\geq 0.06\%$ S or 36 mol H+/t; fine texture $\geq 0.1\%$ S or 62 mol H+/t) (Table 1.1; Sullivan et al. 2018 - full refere 12. For projects that disturb > 1000 t of soil material, the coarse trigger of $\geq 0.03\%$ S or ≥ 18 mol H+/t must be applied in accordance with Sullivan et al. (2018) (full reference above).

13. Acid sulfate soil texture triggers can be related to NCST (2009) textures: coarse and peats = sands to loamy sands; medium = clayey sand to light clays; fine = light medium to heavy clays (Sullivan et al. 2018 - full reference above).

14. Bulk density is required to convert liming rates to soil volume based results. Field bulk density rings can be submitted to EAL for bulk density determination.

checked: Graham Lancaster Laboratory Manager

Environmental Analysis Laboratory, Southern Cross University, Tel. 02 6620 3678, website: scu.edu.au/eal



112 samples supplied by Regional Geotechnical Solutions Pty Ltd on 8/08/2023. Lab Job No. P3902. Analysis requested by Andrew Hills. Your Job: RGS03357.1, Allam Property Group.

44 Bent Street WINGHAM NSW 2429

	Sample Identification	EAL Lab Code	Texture	Moisture Content	_	pH _F and pH _{FOX}				able sulfur	Potential Sulfidic Acidity			Actual Acidity	Retained Acidity		Acid Neutralising Capacity		Net Acidity	Lime Calculation
									(S	₁₀₁)	(Chromium Redu CR			(Titratable Actual Acidity - TAA)			(AN	С _{вт})		
				(% moisture (g moisture / of total wet g of oven weight) dry soil)	рН _F	pH _{FOX}	pH change	Reaction	(% S _{KCI})	(equiv. mol H ⁺/t)	(% S _a)	(mol H */t)	рН _{ксі}	(mol H */t)	(%S _{NAS})	(mol H ⁺/t)	(% CaCO ₃)	(mol H ⁺/t)	(mol H */t)	(kg CaCO ₃ /t DW)
M	lethod Info.		**	**		(In-house m	nethod S21)			*	(In-house m	ethod S20)	(In-hou	se method 16b)		*	(In-house n	nethod S14)	**	**

Environmental Analysis Laboratory, Southern Cross University,

Tel. 02 6620 3678, website: scu.edu.au/eal

15. A negative Net Acidity result indicates an excess acid neutralising capacity.

16. '..' is reported where a test is either not requested or not required. Where pHKCl is < 4.5 or > 6.5, zero is reported for SNAS and ANC in Net Acidity calculations, respectively.

17. Results refer to samples as received at the laboratory. This report is not to be reproduced except in full.

18. ** NATA accreditation does not cover the performance of this service.

19. Analysis conducted between sample arrival date and reporting date.

20. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer SCU.edu.au/eal/t&cs or on request).

21. Results relate to the samples tested.

22. This report was updated on 28/08/2023 and replaces the report issued on 17/08/2023. Net Acidity and KCI extractable Sulfur results are now included.



Non-treated soil



Non-treated soil

checked: Graham Lancaster Laboratory Manager



Appendix C

Acid Sulfate Soils Management Plan



ACID SULFATE SOIL MANAGEMENT PLAN

1 INTRODUCTION

The Acid Sulfate Soil Management Plan (ASSMP) outlined below shall be adopted for all works associated with the excavation of natural soils during the construction of the proposed MHE Stage 2 at 82 Chapmans Road, Tuncurry. The site is identified as Lot 11 DP615229.

This ASSMP is aimed at remediating or controlling the generation of sulphuric acidity during the excavation of actual and potential Acid Sulfate Soils (ASS) where excavations will be undertaken into the natural ground profile.

Attention is drawn to the fact that verification testing of the treated ASS generally takes between 5 and 10 working days and therefore time should be allowed in the earthworks management plan for the site for this process to occur.

2 **RESPONSIBILITIES**

The project superintendent is responsible for implementing the ASS management protocols detailed within this ASSMP. Only a suitably experienced ASS consultant may vary the procedures detailed herein.

The superintendent shall:

- Record a daily log showing the volume of material that has been excavated and treated;
- Ensure that verification testing is undertaken by an independent monitoring consultant on a regular basis.

The requirements of the ASSMP are in addition to, but do not override any other standard procedures such as safety considerations. Where conflict results, or may result from, the implementation of the ASS management as against other performance criteria, the project superintendent shall obtain directives from the project manager or the ASS consultant as appropriate.

3 NEUTRALISING MATERIALS

Fine Agricultural Lime (aglime) will be used for lining of processing or stockpile areas and for blending within excavated materials. Dolomatic aglime, or magnesium blend aglime, should not be used. The aglime shall have:

- At least 85% by weight passing 1mm, and 100% passing 2.5mm. In general a finer grind is better; and
- Aglime shall have a Neutralising Value (NV) of 90% or better (i.e. NV>90).



4 MANAGEMENT AND PROCESSING OF ASS

4.1 Treatment Area

ASS shall be placed in a prepared treatment area on site or within the road corridor at an approved location. To prevent runoff to other areas of the site the treatment area shall be ringed by a bund wall that has a height of at least 0.5m that comprises soils that are not ASS or are treated ASS. The treatment area should be of sufficient size to treat the excavated materials at the proposed excavation rate and to store material for the period required to undertake the verification testing.

The base of the treatment area and bund wall batters shall be limed at a rate of 34kg_{lime}/tonne_{soil}.

4.2 Treatment

The ASS shall be placed in the treatment area and spread in layers of not more than 300mm thick with lime being applied across the treatment area at a rate of 34kg/tonne. The lime shall be evenly mixed and be applied within 8 hours of excavation.

4.3 Verification Testing

Verification testing shall be undertaken by an independent ASS consultant. The number of samples to be tested shall be based on the volume of the stockpile or treated soil within the treatment area as outlined in Table C1.

Volume (m ³)	Number of samples
<250	2
251 - 500	3
501 – 1,000	4
>1,000	4 plus one per additional 500m ³

Table C1. Number of verification samples required based on treated soil/stockpile volume

The samples shall be submitted for testing by the Chromium Reducible Sulfur suite and the Verification Net Acidity compared to ASSMAC Action Criteria. The Verification Net Acidity shall be determined from the test results as outlined below:

Verification net acidity = Potential Sulfidic Acidity + Actual Acidity + Retained Acidity – (Post treatment Acid Neutralising Capacity – Initial Acid Neutralising Capacity)

If testing indicates verification net acidity values that exceed ASSMAC Action Criteria in the processed material, reprocess (potentially requiring variation in the processing methodology) and re-sample to verify that acceptable values have been obtained.

All records applicable to acid sulfate testing and treatment shall be collated to substantiate treatment.



4.4 Water Quality Monitoring

Waters collected in the treatment area (if any) shall be tested for pH on a daily basis during the works. If the recorded pH of any sample is less than 6, it shall be immediately retested. If the pH is again below 6, the pH shall be adjusted by the application of hydrated lime until it is in the range 6 to 8.

Where the pH is less than 4.0, the ASS Consultant shall be engaged within 6 hours to review the site practices and monitoring results and to recommend remedial measures.

Complete records of all monitoring results shall be maintained by the Contractor.

4.5 Post Treatment

Once the ASS materials have been treated in accordance with this ASSMP, the materials may be reused on site, or disposed of at a licensed waste landfill. In accordance with a directive from the EPA, unless a specific order, exemption, or approval is granted from the EPA the treated material may not be reused on another site.