Bore No.	Sample Depth (m)	Material Type	Reaction	pH_F	pH_{FOX}	Screening Test Indicators		
						Moderate or strong reaction with peroxide	pH_F - pH_{FOX}>1	pH_{FOX}<3
31	3.0-3.45	Sand (SCL)	Very Strong	8.5	7.6	✓		
	3.45-4.0	Sand (SCL)	Weak	8.5	6.9		✓	
	4.0-4.5	Sand (SCL)	Very Strong	8.7	7.0	✓	✓	
	4.5-5.0	Sand (SCL)	Very Strong	8.4	6.8	✓	✓	
	5.0-5.5	Sand (SCL)	Very Strong	8.5	6.7	✓	✓	
	5.5-6.0	Sand (SCL)	Very Strong	8.3	7.1	✓	✓	
32	3.0-3.45	Sand	Weak	6.7	5.8			
	3.45-4.0	Sand	Very Strong	7.7	2.7	✓	✓	✓
	4.0-4.5	Clayey Silty Sand	Weak	7.3	3.9		✓	
	5.0-5.5	Clayey Silty Sand	Very Strong	8.3	2.9	✓	✓	✓
	5.5-6.0	Clayey Silt	Very Strong	8.6	2.9	✓	✓	✓

NOTE: SGL – Sand and gravel with silty/ clay lenses, SCL – Sand with silt/ clay lenses, SSL – Sand with sandy silt lenses

Summary of Field pH Screening Test Results

Bore No.	Depth (m)	Material Type	Reaction	pH_F	pH_{FOX}	Screening Test Indicators		
						Moderate or strong reaction with peroxide	$pH_F - pH_{FOX}>1$	$pH_{FOX}<3$
BPB-13	0.0-0.25	Fill - Sand	Very Weak	8.8	5.9		✓	
	0.25-0.5	Fill - Sand	Very Weak	8.4	5.7		✓	
	0.5-0.75	Fill - Sand	Very Weak	8.1	5.5		✓	
	0.75-1.0	Fill - Sand	Very Weak	8.1	5.6		✓	
	1.0-1.25	Fill - Sand	Very Weak	7.9	5.7		✓	
	1.25-1.5	Fill - Sand	Very Weak	7.8	5.5		✓	
	1.5-1.75	Fill - Sand	Very Weak	7.9	5.7		✓	
	1.75-2.0	Fill - Sand	Very Weak	7.9	5.6		✓	
	2.0-2.25	Fill - Sand	Very Weak	7.8	5.4		✓	
	2.25-2.5	Fill - Sand	Very Weak	7.7	5.5		✓	
	2.5-2.75	Fill - Sand	Very Weak	7.7	5.5		✓	
	2.75-3.0	Fill - Sand	Very Weak	7.5	5.4		✓	
	3.0-3.25	Fill - Sand	Very Weak	6.7	2.0		✓	✓
	3.25-3.5	Clay	Very Strong	5.0	3.1	✓	✓	
	3.5-3.75	Fill - Sand	Weak	5.8	3.3		✓	
	3.75-4.0	Fill - Sand	Weak	6.6	4.1		✓	
	4.0-4.25	Fill - Sand	Weak	6.6	5.0		✓	
	4.25-4.5	Fill - Sand	Weak	6.7	5.0		✓	
	4.5-4.75	Fill - Sand	Weak	6.9	1.7		✓	✓
	4.75-5.0	Fill - Sand	Weak	7.2	4.9		✓	
	5.0-5.25	Fill - Sand	Weak	7.3	5.1		✓	
	5.25-5.5	Fill - Sand	Weak	7.8	5.3		✓	
	5.5-5.75	Fill - Sand	Weak	8.7	5.1		✓	
	5.75-6.0	Fill - Sand	Weak	8.6	2.7		✓	✓
	6.0-6.25	Fill - Sand	Weak	8.5	5.3		✓	
	6.25-6.5	Fill - Sand	Weak	8.9	2.9		✓	✓
B24	0.0-0.25	Fill - Sand	Very Weak	7.9	5.7		✓	
	0.25-0.5	Fill - Sand	Very Weak	7.8	5.5		✓	
	0.5-0.75	Fill - Sand	Very Weak	8.5	6.0		✓	
	0.75-1.0	Fill - Sand	Very Weak	8.1	6.0		✓	
	1.0-1.25	Fill - Sand	Very Weak	8.6	6.1		✓	
	1.25-1.5	Fill - Sand	Very Weak	7.8	6.1		✓	
	1.5-1.75	Fill - Sand	Very Weak	7.9	6.8		✓	
	1.75-2.0	Fill - Sand	Very Weak	8.2	6.5		✓	
	2.0-2.25	Fill - Sand	Very Weak	8.1	6.4		✓	
	2.25-2.4	Fill - Sand	Strong	7.9	4.9	✓	✓	

Summary of Field pH Screening Test Results

Bore No.	Depth (m)	Material Type	Reaction	pH_F	pH_{FOX}	Screening Test Indicators		
						Moderate or strong reaction with peroxide	$pH_F - pH_{FOX} > 1$	$pH_{FOX} < 3$
B25	0.25-0.5	Fill - Sand	Weak	7.1	5.3		✓	
	0.75-1.0	Fill - Sand	Weak	7.2	5.8		✓	
	1.25-1.5	Fill - Sand	Weak	7.1	5.8		✓	
	2.0-2.25	Fill - Sand	Weak	7.0	5.8		✓	
	2.4-2.5	Fill - Sand	Weak	7.1	5.9		✓	
	2.6-2.75	Fill - Sand	Very Strong	7.9	6.8	✓	✓	
	2.8-3.0	Fill - Sand	Very Weak	8.1	6.0		✓	
	3.0-3.2	Fill - Sand	Very Weak	8.6	6.1		✓	
	3.2-3.5	Fill - Sand	Very Weak	8.5	6.0		✓	
	3.5-3.6	Fill - Sand	Very Weak	7.8	5.9		✓	
	3.6-3.75	Fill - Sand	Very Weak	7.7	5.9		✓	
	3.75-4.0	Fill - Sand	Very Weak	7.4	5.9		✓	
	4.0-4.25	Fill - Sand	Very Weak	7.3	5.8		✓	
	4.5-4.75	Fill - Sand	Very Weak	6.9	5.9		✓	
	5.0-5.25	Fill - Sand	Very Weak	7.0	5.6		✓	
	5.25-5.5	Fill - Sand	Very Weak	7.2	5.6		✓	
	5.5-5.8	Fill - Sand	Very Weak	7.2	5.7		✓	
	5.8-6.0	Fill - Sand	Very Weak	7.1	5.6		✓	
B26	0.25-0.5	Fill - Sand	Weak	5.7	4.7		✓	
	0.5-0.75	Fill - Sand	Weak	6.7	6.1			
	0.75-1.0	Fill - Sand	Weak	6.9	5.9		✓	
	1.0-1.25	Fill - Sand	Very Weak	7.0	6.0		✓	
	1.5-1.75	Fill - Sand	Very Weak	7.0	5.9		✓	
	1.75-2.0	Fill - Sand	Very Weak	7.0	5.9		✓	
	2.0-2.25	Fill - Sand	Very Weak	6.9	5.9		✓	
	2.75-3.0	Fill - Sand	Very Weak	6.8	5.9			
	3.0-3.25	Fill - Sand	Very Weak	6.7	5.9			
	3.25-3.5	Fill - Sand	Very Weak	5.8	2.0		✓	✓
	3.5-3.75	Fill - Sand	Very Weak	6.1	5.6			
	3.75-4.0	Fill - Sand	Very Weak	6.2	5.9			
	4.0-4.25	Fill - Sand	Very Weak	6.4	5.9			
	4.25-4.5	Fill - Sand	Very Weak	6.6	5.9			
	4.5-4.75	Fill - Sand	Very Weak	6.6	5.9			
	4.75-5.0	Fill - Sand	Very Weak	6.8	5.4		✓	
	5.0-5.25	Fill - Sand	Very Weak	6.6	5.4		✓	

Summary of Field pH Screening Test Results

Bore No.	Depth (m)	Material Type	Reaction	pH_F	pH_{FOX}	Screening Test Indicators		
						Moderate or strong reaction with peroxide	pH_F - pH_{FOX}>1	pH_{FOX}<3
B27	0.75-1.0	Fill - Sand	Very Weak	7.0	5.4		✓	
	1.0-1.25	Fill - Sand	Very Weak	7.1	5.9		✓	
	1.25-1.5	Fill - Sand	Very Strong	6.9	6.0	✓		
	2.5-2.75	Fill - Sand	Very Weak	7.3	6.0		✓	
	2.75-3.0	Fill - Sand	Very Weak	7.5	5.9		✓	
	3.0-3.25	Fill - Sand	Very Weak	7.3	6.4			
	3.25-3.5	Fill - Sand	Very Weak	7.3	6.0		✓	
	3.5-3.75	Fill - Sand	Very Weak	7.1	6.1		✓	
	3.75-4.0	Fill - Sand	Very Weak	7.3	6.2		✓	
	4.0-4.25	Fill - Sand	Very Weak	7.3	6.0		✓	
	4.25-4.5	Fill - Sand	Very Weak	7.3	6.0		✓	
	4.5-4.75	Fill - Sand	Very Weak	7.5	6.0		✓	
	4.75-5.0	Fill - Sand	Very Weak	7.0	6.0		✓	
	5.0-5.25	Fill - Sand	Very Weak	7.0	6.0		✓	
	5.25-5.5	Fill - Sand	Very Weak	7.0	5.9		✓	
	5.5-5.8	Fill - Sand	Very Weak	6.9	5.9		✓	
	5.75-6.0	Fill - Sand	Very Weak	7.3	2.9		✓	✓

APPENDIX C

LABORATORY REPORTS

CERTIFICATE OF ANALYSIS

CONTACT:	MS C BATTEN	BATCH:	EB56280
CLIENT:	BUTLER PARTNERS PTY LTD	SUB BATCH:	0
ADDRESS:		LABORATORY:	BRISBANE
	P O BOX 2267	DATE RECEIVED:	27/06/2003
	FORTITUDE VALLEY QLD 4006	DATE COMPLETED:	03/07/2003
		SAMPLE TYPE:	SOIL
ORDER No.:	CB12	No. of SAMPLES:	7
PROJECT:	03900		

COMMENTS

Results apply to sample(s) as submitted. POCAS as per method of Ahern et al (1998). Results expressed as mole H^+/tonne.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: BRISBANE

Address
32 Shand Street
Stafford QLD 4053
Australia

Phone: 61-7-3243 7222
Fax: 61-7-3243 7218
Email: michael.heery@alsenviro.com

Signatory

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

NATA Accredited Laboratory Number 825

Site: BRISBANE

Batch: EB56280
Sub Batch: 0
Date of Issue: 03/07/2003
Client: BUTLER PARTNERS PTY LTD
Client Reference: 03900

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	2	3	4	5	6	7			
		Date Sampled		25/06/2003	25/06/2003	25/06/2003	25/06/2003	25/06/2003	25/06/2003	25/06/2003			
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	30 3.0-3.5	30 3.5-4.0	30 4.5-5.0	14 5.5-6.0	19 5.5-6.0	27 4.5-5.0	27 5.5-6.0			
EA-002	pH after Oxidation		0.1	5.1	2.6	3.0	2.8	3.6	3.9	3.1			
EA-022	Ca (Acid Reacted)	%	0.02	0.21	—	0.02	—	0.12	—	0.08			
EA-022	Ca (KCl)	%	0.02	0.11	—	0.03	—	0.11	—	0.05			
EA-022	Ca (Peroxide)	%	0.02	0.32	—	0.05	—	0.23	—	0.13			
EA-022	Mg (Acid Reacted)	%	0.02	0.02	—	0.02	—	0.07	—	0.04			
EA-022	Mg (KCl)	%	0.02	0.02	—	<0.02	—	0.06	—	0.03			
EA-022	Mg (Peroxide)	%	0.02	0.04	—	0.04	—	0.13	—	0.07			
EA-022	Na (Acid Reacted)	%	0.02	<0.02	—	<0.02	—	0.05	—	0.09			
EA-022	Na (KCl)	%	0.02	<0.02	—	0.03	—	0.11	—	0.14			
EA-022	Na (Peroxide)	%	0.02	0.03	—	0.05	—	0.16	—	0.23			
EA-022	S (KCl)	%	0.02	<0.02	—	<0.02	—	<0.02	—	<0.02			
EA-022	S (Peroxide)	%	0.02	0.23	—	0.14	—	0.34	—	0.21			
EA-022	S (Pos)	%	0.02	0.22	—	0.13	—	0.33	—	0.20			
EA-022	TAA	mole/tonne	2	<2	—	<2	—	<2	—	<2			
EA-022	TPA	mole/tonne	2	<2	158	25	37	6	17	39			
EA-022	TSA	mole/tonne	2	<2	—	25	—	6	—	39			
EA-022	pH (KCl)		0.1	6.9	—	6.4	—	7.1	—	7.0			

Batch: EB56280
Sub Batch: 0
Date of Issue: 03/07/2003
Client: BUTLER PARTNERS PTY LTD
Client Reference: 03900

QUALITY CONTROL REPORT

METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	SAMPLE IDENTIFICATION									
		Laboratory I.D.		200									
		Date Sampled		27/06/2003									
				Method Blank 1									
				CHECKS AND SPIKES									
EA-002	pH after Oxidation		0.1	—									
EA-022	Ca (Acid Reacted)	%	0.02	<0.02									
EA-022	Ca (KCl)	%	0.02	<0.02									
EA-022	Ca (Peroxide)	%	0.02	<0.02									
EA-022	Mg (Acid Reacted)	%	0.02	<0.02									
EA-022	Mg (KCl)	%	0.02	<0.02									
EA-022	Mg (Peroxide)	%	0.02	<0.02									
EA-022	Na (Acid Reacted)	%	0.02	<0.02									
EA-022	Na (KCl)	%	0.02	<0.02									
EA-022	Na (Peroxide)	%	0.02	<0.02									
EA-022	S (KCl)	%	0.02	<0.02									
EA-022	S (Peroxide)	%	0.02	<0.02									
EA-022	S (Pos)	%	0.02	<0.02									
EA-022	TAA	mole/tonne	2	<2									
EA-022	TPA	mole/tonne	2	<2									
EA-022	TSA	mole/tonne	2	<2									
EA-022	pH (KCl)		0.1	—									

QC REPORT

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MR R JACOBSEN	**BATCH:**	EB55137
CLIENT:	BUTLER PARTNERS PTY LTD	**SUB BATCH:**	0
ADDRESS:		**LABORATORY:**	BRISBANE
	P O BOX 2267	**DATE RECEIVED:**	16/05/2003
	FORTITUDE VALLEY QLD 4006	**DATE COMPLETED:**	20/05/2003
		SAMPLE TYPE:	SOIL
ORDER No.:	RJ37	**No. of SAMPLES:**	3
PROJECT:	03900		

COMMENTS

Results apply to sample(s) as submitted. POCAS as per method of Ahern et al (1998). Results expressed as mole H+/tonne.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: BRISBANE

Address
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Stafford QLD 4053
Australia

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Email: geoff.lecornu@alsenviro.com

Signatory K Mitchell

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NATA Accredited Laboratory Number 825

Batch: EB55137
Sub Batch: 0
Date of Issue: 20/05/2003
Client: BUTLER PARTNERS PTY LTD
Client Reference: 03900

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	2	3							
		Date Sampled		15/05/2003	15/05/2003	15/05/2003							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	03900 9/8 (9-8)	03900 15/4.0m	03900 13/4(B-S)							
EA-002	pH after Oxidation		0.1	4.4	3.8	6.6							
EA-022	Ca (Acid Reacted)	%	0.02	<0.02	<0.02	0.16							
EA-022	Ca (KCl)	%	0.02	0.03	0.02	0.35							
EA-022	Ca (Peroxide)	%	0.02	0.03	0.03	0.51							
EA-022	Mg (Acid Reacted)	%	0.02	<0.02	<0.02	0.04							
EA-022	Mg (KCl)	%	0.02	<0.02	<0.02	0.17							
EA-022	Mg (Peroxide)	%	0.02	<0.02	<0.02	0.21							
EA-022	Na (Acid Reacted)	%	0.02	<0.02	<0.02	<0.02							
EA-022	Na (KCl)	%	0.02	<0.02	<0.02	0.02							
EA-022	Na (Peroxide)	%	0.02	<0.02	<0.02	0.02							
EA-022	S (KCl)	%	0.02	<0.02	<0.02	0.07							
EA-022	S (Peroxide)	%	0.02	0.03	0.03	0.40							
EA-022	S (Pos)	%	0.02	0.02	0.02	0.32							
EA-022	TAA	mole/tonne	2	<2	<2	<2							
EA-022	TPA	mole/tonne	2	<2	<2	<2							
EA-022	TSA	mole/tonne	2	<2	<2	<2							
EA-022	pH (KCl)		0.1	5.9	6.5	7.4							

Batch: EB55137
Sub Batch: 0
Date of Issue: 20/05/2003
Client: BUTLER PARTNERS PTY LTD
Client Reference: 03900

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		200									
		Date Sampled		16/05/2003									
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	Method Blank 1									
				CHECKS AND SPIKES									
EA-002	pH after Oxidation		0.1	—									
EA-022	Ca (Acid Reacted)	%	0.02	<0.02									
EA-022	Ca (KCl)	%	0.02	<0.02									
EA-022	Ca (Peroxide)	%	0.02	<0.02									
EA-022	Mg (Acid Reacted)	%	0.02	<0.02									
EA-022	Mg (KCl)	%	0.02	<0.02									
EA-022	Mg (Peroxide)	%	0.02	<0.02									
EA-022	Na (Acid Reacted)	%	0.02	<0.02									
EA-022	Na (KCl)	%	0.02	<0.02									
EA-022	Na (Peroxide)	%	0.02	<0.02									
EA-022	S (KCl)	%	0.02	<0.02									
EA-022	S (Peroxide)	%	0.02	<0.02									
EA-022	S (Pos)	%	0.02	<0.02									
EA-022	TAA	mole/tonne	2	<2									
EA-022	TPA	mole/tonne	2	<2									
EA-022	TSA	mole/tonne	2	<2									
EA-022	pH (KCl)		0.1	—									

QC REPORT

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: BUTLER PARTNERS PTY LTD	*Laboratory*	: ALS Environmental Brisbane	*Page*	: 1 of 6
Contact	: MR ST JOHN HERBERT	*Contact*	: Michael Heery	*Work Order*	: **EB0609621**
Address	: P O BOX 2267 FORTITUDE VALLEY BC QLD AUSTRALIA 4006	*Address*	: 32 Shand Street Stafford QLD Australia 4053		
E-mail	: stjherbert@butlerpartners.com.au	*E-mail*	: services.brisbane@alsenviro.com		
Telephone	: 07 3852 3800	*Telephone*	: +61 (07) 3243 7222		
Facsimile	: 07 3852 3808	*Facsimile*	: +61 (07) 3243 7259		
Project	: 03900H	*Quote number*	: BN/217/06	*Date received*	: 27 Sep 2006
Order number	: SH			*Date issued*	: 11 Oct 2006
C-O-C number	: - Not provided -			*No. of samples*	- *Received* : 12
Site	: - Not provided -				*Analysed* : 12

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NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

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Accredited for compliance with ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	*Position*	*Department*
Cass Sealby	Senior Chemist - Acid Sulphate Soils	Inorganics - NATA 825 (818 - Brisbane)

ALS Environmental

Comments

This report for the ALSE reference EB0609621 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical Results for Samples Submitted**
- **Surrogate Recovery Data**

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **EB0609621**

Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime ($CaCO_3$) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. Conversion to liming rate in kg/m3 = kg/t x wet bulk density in t/m3.
Retained Acidity not required because pH KCl greater than or equal to 4.5

Client : BUTLER PARTNERS PTY LTD
Work Order : EB0609621

ALS Environmental

Analytical Results

			Client Sample ID :	B27-1.25	B27-3.25	B27-5.76	B26-1.0	B26-4.75
			Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Date / Time :	27 Sep 2006 15:00	27 Sep 2006 15:00	27 Sep 2006 15:00	27 Sep 2006 15:00	27 Sep 2006 15:00
			Laboratory Sample ID :	EB0609621-001	EB0609621-002	EB0609621-003	EB0609621-004	EB0609621-005
Analyte	*CAS number*	*LOR*	*Units*					
EA033-A: Actual Acidity								
pH KCl (23A)		0.1	pH Unit	7.6	7.0	8.7	7.3	6.8
Titratable Actual Acidity (23F)		2	mole H+ / t	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)		0.02	% S	<0.02	<0.02	0.03	<0.02	0.03
acidity - Chromium Reducible Sulfur (a-22B)		10	mole H+ / t	<10	<10	20	<10	18
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A1)		0.01	% CaCO3	0.38	0.48	0.42	0.60	0.69
acidity - Acid Neutralising Capacity (a-19A1)		10	mole H+ / t	76	96	84	120	138
sulfidic - Acid Neutralising Capacity (s-19A1)		0.01	% pyrite S	0.12	0.15	0.13	0.19	0.22
EA033-E: Acid Base Accounting								
ANC Fineness Factor		0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)		0.02	% S	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)		10	mole H+ / t	<10	<10	<10	<10	<10
Liming Rate		1	kg CaCO3/t	<1	<1	<1	<1	<1

ALS Environmental

Analytical Results

			Client Sample ID :	B26-3.5	B25-1.2	B25-2.6	B25-5.8	BPB13-13
			Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Date / Time :	27 Sep 2006 15:00	27 Sep 2006 15:00	27 Sep 2006 15:00	27 Sep 2006 15:00	27 Sep 2006 15:00
			Laboratory Sample ID :					
Analyte	**CAS number**	**LOR**	**Units**	**EB0609621-006**	**EB0609621-007**	**EB0609621-008**	**EB0609621-009**	**EB0609621-010**
EA033-A: Actual Acidity								
pH KCl (23A)		0.1	pH Unit	6.5	6.5	6.7	7.2	5.9
Titratable Actual Acidity (23F)		2	mole H+ / t	<2	<2	<2	<2	4
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)		0.02	% S	<0.02	<0.02	<0.02	0.03	0.14
acidity - Chromium Reducible Sulfur (a-22B)		10	mole H+ / t	<10	<10	<10	20	86
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A1)		0.01	% CaCO3	0.43	0.69	0.45	0.30	----
acidity - Acid Neutralising Capacity (a-19A1)		10	mole H+ / t	86	138	90	60	----
sulfidic - Acid Neutralising Capacity (s-19A1)		0.01	% pyrite S	0.14	0.22	0.14	0.10	----
EA033-E: Acid Base Accounting								
ANC Fineness Factor		0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)		0.02	% S	<0.02	<0.02	<0.02	<0.02	0.14
Net Acidity (acidity units)		10	mole H+ / t	<10	<10	<10	<10	90
Liming Rate		1	kg CaCO3/t	<1	<1	<1	<1	7

Client : BUTLER PARTNERS PTY LTD
Work Order : EB0609621

ALS Environmental

Analytical Results

			Client Sample ID :	BPB13-19	BPB-24			
			Sample Matrix Type / Description :	SOIL	SOIL			
			Sample Date / Time :	27 Sep 2006 15:00	27 Sep 2006 15:00			
			Laboratory Sample ID :	EB0609621-011	EB0609621-012			
Analyte	CAS number	LOR	Units					
EA033-A: Actual Acidity								
pH KCl (23A)		0.1	pH Unit	6.6	7.3			
Titratable Actual Acidity (23F)		2	mole H+ / t	<2	<2			
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	<0.02			
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)		0.02	% S	<0.02	0.02			
acidity - Chromium Reducible Sulfur (a-22B)		10	mole H+ / t	<10	15			
EA033-C: Acid Neutralising Capacity								
Acid Neutralising Capacity (19A1)		0.01	% CaCO3	0.45	0.54			
acidity - Acid Neutralising Capacity (a-19A1)		10	mole H+ / t	90	108			
sulfidic - Acid Neutralising Capacity (s-19A1)		0.01	% pyrite S	0.14	0.17			
EA033-E: Acid Base Accounting								
ANC Fineness Factor		0.5	-	1.5	1.5			
Net Acidity (sulfur units)		0.02	% S	<0.02	<0.02			
Net Acidity (acidity units)		10	mole H+ / t	<10	<10			
Liming Rate		1	kg CaCO3/t	<1	<1			

ALS Environmental

Surrogate Control Limits

- **No surrogates present on this report.**

APPENDIX D

ACID SULFATE SOIL MANAGEMENT PLAN

Portside Wharf – Stage 2 – Buildings 2, 4 & 5
Harbour Road, Hamilton
Acid Sulfate Soil Management Plan (ASSMP)

Element	Acid Sulfate Soil Management Plan
Objective/Target	The objective of the ASS Management Plan is to control any potential acid generation from the natural soils and to restrict to an acceptable level any potential on site and off site environmental impacts for site bulk excavation to RL0.6m AHD.
ASS Management Strategy	To mitigate and manage potential environmental impacts associated with ASS during site construction operations. This will be achieved as follows: • The excavation of natural clays and sands interbedded with clay or silt material within the site will be undertaken to a materials handling and management strategy. • Appropriate erosion control measures will be adopted to limit sediment loss due to run-off from within the site. • Monitoring of waters collected within the work site will be carried out with treatment (if necessary) to a level suitable for discharge into external waterways.
Tasks/Actions	The following actions have been carried out prior to the commencement of the construction and earthworks activities: • ASS investigations have been carried out to assess soils to a bulk excavation level of RL0.6m AHD. The natural clays and sands interbedded with silt/clay encountered at the site have been shown to contain levels of oxidisable sulphur, which has the potential to generate acidity, and these soils will require lime treatment for neutralisation. The fill, containing no silt/clay, encountered at the test locations carried out across the site have been shown to have a very low to insignificant actual/potential acidity, and do not require treatment. • During bulk earthworks required liming rates are to be verified by undertaking additional Suspension Peroxide Oxidation – Combined Acidity and Sulfur (SPOCAS) or Chromium Suite analyses. These additional analyses are to be undertaken at a rate of one test per 300m^3 of natural spoil from the basement excavation. • The exposed natural soil surface in the excavation base and walls in natural silt/clay material should be lime treated at liming rate of not less than 5kg/square metre. • Lime-treated stockpiled soil shall have sediment fences and/or hay bales placed downslope to intercept any eroded material. Earthen bunds shall be constructed downslope of any filled or stockpile areas to divert run-off/drainage to a temporary retention pond. All retained waters would then be tested before entering the site stormwater system and/or adjacent waterways. • ASS is required to be treated off-site and will be treated under an approved ASSMP for the receiving/treatment facility.

Portside Wharf – Stage 2 – Buildings 2, 4 & 5
Harbour Road, Hamilton
Acid Sulfate Soil Management Plan (ASSMP)

Element	Acid Sulfate Soil Management Plan
Performance Indicators	Retained Water Laboratory testing of retention basin/tank drainage water will be carried out for pH, dissolved oxygen and turbidity. Levels of these parameters considered acceptable are as follows: pH — 6.5 to 8.5 pH units Turbidity — <20NTU Dissolved Oxygen — >80% saturated Laboratory analysis for the following parameters should also be performed (as per the State Planning Policy 2/02 *'Planning and Managing Development involving Acid Sulfate Soils'*) if the pH <6.5: • Bicarbonate • Calcium • Carbonate • Chloride • Colour • Dissolved magnesium • Filtered aluminium • Magnesium • Sulfate • Total and dissolved iron
Frequency/Timing	Retained Water When run-off accumulates, water quality in drains or retention basins/tanks will be monitored regularly (frequency based on total volume retained) during the construction period, particularly following substantial rainfall events. Retained water will be sampled, tested and treated to a level acceptable for discharge to external waterways.
Contingency Plan	If management of ASS is unsuccessful whereby performance targets are not being met as indicated by the validation testing and water quality testing procedures. • The earthworks schedule will be reassessed and action taken to determine the problems causing the breach of standards. • If the problems are related to ineffective implementation of the ASS Management Plan, then the plan will be audited by a person nominated by the superintendent to ensure improved implementation. Monitoring and testing will be increased to ensure compliance with the established standards. • Any significant changes to the Management Plan will be subject to discussions with the relevant regulatory authorities.
Responsibility	The satisfactory implementation of the ASS Management Plan is the responsibility of the contractor commissioned to undertake the treatment of ASS.
Reporting	The contractor undertaking the treatment of the ASS shall report to the Principal Contractor on: • The effectiveness of the operating strategies. • Problems in implementing the ASSMP management strategies. • Compliance with testing requirements, run-off control and materials handling. • Effectiveness of any corrective action adopted.