



Geotechnical Discovery



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Transport for NSW
Authorised Engineering
Organisation

GEOTECHNICAL INVESTIGATION REPORT

PROJECT: SEAGULL DRIVE BOAT RAMP, LOCH SPORT

CLIENT: BMT COMMERCIAL AUSTRALIA Pty Ltd

DATE: 15 FEBRUARY 2024

REPORT No.: GE13574-23



GEOTESTA PTY LTD ABN 91 851 620 815
Level 1, 7 Business Park Drive, Notting Hill, VIC 3168
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1. INTRODUCTION

Geotesta was engaged by BMT Commercial Australia Pty Ltd (Client) to undertake geotechnical investigation for the proposed development boat ramp at Seagull Drive, Loch Sport. It is understood that client plans to improve the existing boat ramps.

The geotechnical investigation work was conducted on 22 January 2024 and consisted of drilling one (1) deep borehole to a maximum depth of 10.0m below the existing surface level, three (3) Dynamic Cone Penetrometer (DCP) to a maximum depth of 2m from the existing water level.

This report presents the results of the geotechnical investigation including site geology, subsurface soil conditions, in-situ testing results, laboratory testing results, salinity and aggressivity assessment, and recommendations on design CBR and parameters for designing foundations.

3. FINDINGS

3.1 Site Conditions

The Seagull boat ramp is situated north to the 31 Seagull Drive, Loch Sport, VIC 3851. The existing boat ramp includes a car park area. The topography is generally flat. The land area closer to the BH1 location predominantly comprises small to medium sized trees. The approximate water level at DCP locations DCP1 to DCP3 was around 0.7m.

3.2 Site Geology

The 1:250,000 geological map published by the Geological Survey of Victoria indicates that the site is underlain by Coastal Dune Deposits (Qd1) which predominantly consists of sand, silt, clay, well sorted, poorly consolidated, coastal dune and beach deposits with some swamp deposits.

A geological map of the site is shown in **Figure 2**.

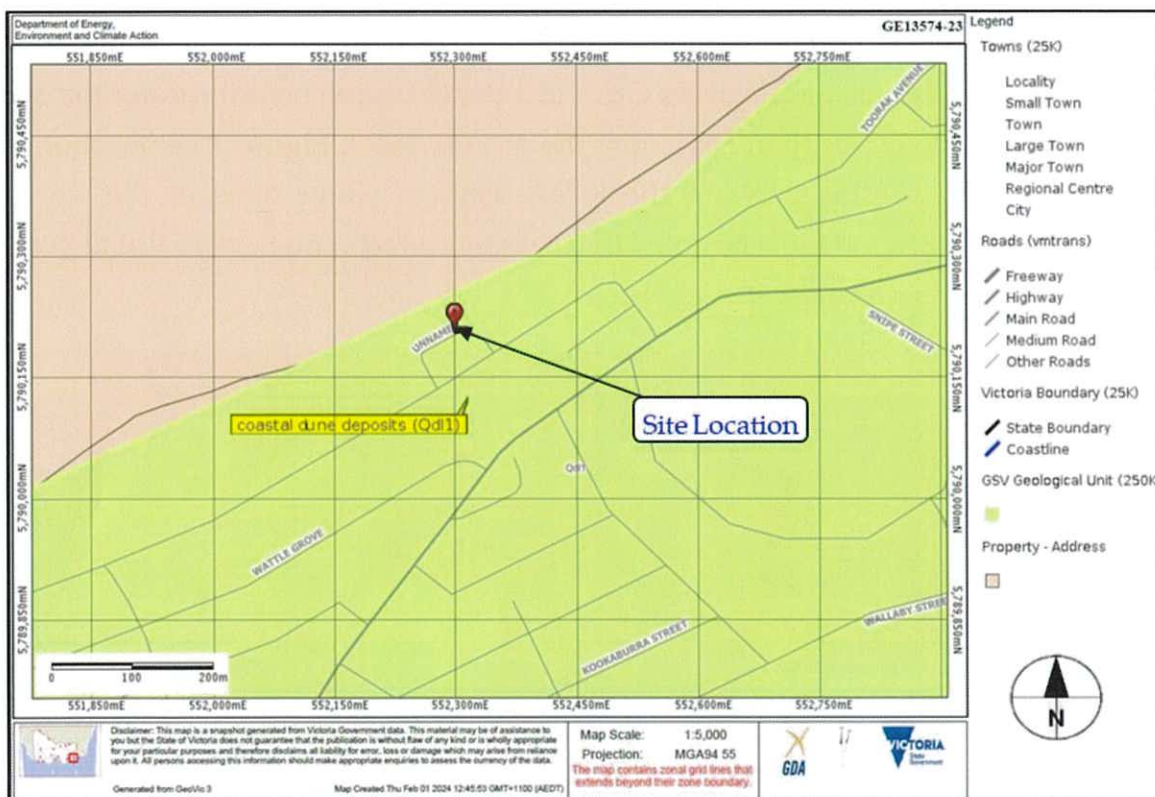


Figure 2: Geological map (Source: Geological Survey of Victoria)

3.5 Laboratory Testing

Laboratory testing on soil samples collected during the geotechnical investigation was carried out in Geotesta's NATA accredited laboratory. The laboratory test results are summarised in **Table 2**. Laboratory test certificates are attached in **Appendix B**.

Table 2: Summary of laboratory test results

Borehole No.	Depth (m)	Material Type	Wn %	LL %	PI %	LS %	% Sand
BH1	1.5	Sand	16.2	-	-	-	-
BH1	1.5-2.0	Sand	10.7	-	-	-	92
BH1	3.0	Sand	29.1	-	-	-	-
BH1	4.5	Sand	19.8	-	-	-	-
BH1	5.0-5.5	Sand	5.8	-	-	-	81
BH1	6.0	Sand	26.2	-	-	-	-
BH1	7.5	Sand	25.4	-	-	-	-
BH1	9.0	Sand	18.7	-	-	-	-
BH1	10.0	Sand	22.8	-	-	-	-

Note: Wn - Moisture Content; LL - Liquid Limit; PI - Plasticity Index; LS - Linear Shrinkage

3.6 Salinity and Aggressivity Assessment

Two (2) soil samples were submitted to Eurofins MGT Laboratory, a NATA accredited laboratory, for the salinity and aggressivity assessment. The testing was carried out for aggressivity suit and to assess the exposure classification for the proposed development.

Sampling was targeted to achieve a representative coverage of site conditions in line with assessed sub-surface profiles, proposed development, and the investigation scope. The laboratory testing certificates are presented in **Appendix B**.

3.6.1 Salinity Assessment

Laboratory test results for the salinity assessment are summarised in **Table 3**.

Table 3: Soil Salinity Test Results

Sample ID	Conductivity (Ec) (1:5 Aqueous extract (μ S/cm)	ECe ¹ (ds/m)	Salinity Assessment ²
BH1 @ 2.0m	110	1.87	Non-Saline
BH1 @ 9.0m	680	11.56	Highly-Saline

Table 7: Exposure Classification for Steel Piles in Sea Water

Exposure Conditions	Exposure Classification
Sea Water - Submerged	Severe
Sea Water – Tidal/Splash Zone – Cold Water (South of 30S)	Severe
Sea Water – Tidal/Splash Zone – Tropical/Subtropical Water (North of 30S)	Very Severe

**In accordance with Table 6.5.2 (A), AS2159 -2009*

3.6.3 Exposure Classifications for Concrete and Steel in Saline and Sulfate Soils

The site soil is considered highly saline to non-saline for concrete and steel piles, mild aggressive for concrete piles, and moderate to mild aggressive for steel piles.

Borehole No.	Depth (m)	Soil Material	Allowable Unit Skin Friction (kPa)	Allowable End Bearing (kPa)
	9.0-10.0	Sand (medium dense)	30	1100
	10-10.5	Sand (medium dense)	30	1200

It should be noted that the soil profile may vary across the site. It is recommended that a geotechnical engineer be engaged during the bored pier excavation stage to confirm founding depth and founding material. Installation of bored piers below groundwater shall require casing to protect the bored pier shaft from collapsing. A specialist piling contractor familiar with similar ground condition shall be engaged to carry the piling works.

4.3 Allowable Bearing Capacity for DCP Test Locations

Based on generalisation of the subsurface profile, the allowable bearing capacities for the DCP locations DCP1 to DCP3 is presented in **Table 10** below. DCP test results are presented in **Appendix A**.

Table 10: Allowable bearing capacity for DCP Test Locations

Borehole Location	Depth from top of water (m)	Soil	Allowable Bearing capacity (kPa)
DCP1	0.0-0.7	Water	-
	0.7-1.3	Sand (medium dense)	60
	1.3-1.6	Sand (dense)	150
	1.6-2.0	Sand (very dense)	300
DCP2	0.0-0.7	Water	-
	0.7-1.1	Sand (medium dense)	60
	1.1-1.4	Sand (dense)	150
	1.4-2.0	Sand (very dense)	300
DCP3	0.0-0.7	Water	-
	0.7-0.8	Sand (Loose)	-
	0.8-1.2	Sand (dense)	150
	1.2-1.5	Sand (very dense)	300
	1.5-2.0	Sand (very dense)	350

channel water and perched water is likely to influence excavation stability hence excavation support will likely need to be implemented. In addition, sump pumps and other suitable water removal methods will need to be implemented to remove water during construction.

5.3 Temporary Cut Batters

Any unsupported temporary cut batter into the sand layers should not be steeper than 1H:1V up to 1.5m high. Should groundwater/perched water be encountered during the excavation of material, it is recommended that a geotechnical engineer be engaged to provide advice on any proposed temporary cut batters.

The above recommendations assume that there are no existing structures or underground services adjacent to the excavation area. The allowable cut batter slopes may need to be revised based on the location of any adjacent structures and services following the commencement of earthworks at the site. It should be noted that following rainy periods, some degree of deterioration and minor slumping of unsupported cut batters is to be anticipated.

5.4 Design CBR Value

Based on the in-situ testing, and known geological properties, a CBR value of 5.0% is recommended for natural sandy subgrade. Lab testing should be conducted for more accurate results.

The prepared subgrade is to be assessed by a suitably qualified engineer before commencing pavement construction. Any localised soft spots are to be excavated and filled in accordance with recommendations provided below.

5.5 Subgrade Preparation

It should be noted that the Sand will be the subgrade for the proposed pavement. It is recommended that the following procedures be adopted for the preparation of subgrade beneath pavements:

Silty Sand:

- Compact the exposed material using a minimum 12-tonne smooth drum roller.
- Proof rolls the area using a minimum 12-tonne smooth drum roller to ensure no soft spots are present.
- Any soft spots encountered during the above compaction process should be excavated and backfilled with in-situ fill material without particle sizes greater than 75mm.

DOCUMENT CONTROL

Date:	Version:	Report Prepared By:	Report Reviewed By:
15 Feb. 2024	GE13574-23	Abishek Gade Martin BTech (Civil) MSc MIEAust Geotechnical Engineer	Aathee T Aatheesan BScEng(Hons) PhD MIEAust Senior Geotechnical Engineer

Information about this Report

The report contains the results of a geotechnical investigation conducted for a specific purpose and client. The results should not be used by other parties, or for other purposes, as they may contain neither adequate nor appropriate information. In particular, the investigation does not cover contamination issues unless specifically required to do so by the client.

Test Hole Logging

The information on the test hole logs (boreholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where test information is available (field and/or laboratory results). The test hole logs include both factual data and inferred information.

Groundwater

Unless otherwise indicated, the water levels presented on the test hole logs are the levels of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater level may differ from this recorded level depending on material permeability (i.e. depending on response time of the measuring instrument). Further, variations of this level could occur with time due to such effects as seasonal, environmental and tidal fluctuations or construction activities. Confirmation of groundwater levels, phreatic surfaces or piezometric pressures can only be made by appropriate instrumentation techniques and monitoring programmes.

Interpretation of Results

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete test hole data. Generalized, idealized or inferred subsurface conditions (including any geotechnical cross-sections) have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

Change in Conditions

Local variations or anomalies in the generalized ground conditions do occur in the natural environment, particularly between discrete test hole locations. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural forces.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to GEOTESTA for appropriate assessment and comment.

SITE PHOTOGRAPHS



DCP3 testing location; looking at east



BOREHOLE LOG

BH NO.: BH1

SHEET: 1 OF 3

CLIENT:	BMT Commercial Australia	DRILLING CO.:	Rockwell Drilling	EASTING:	Refer Site Plan
PROJECT:	Seagull Drive Boat Ramp	DRILL RIG:	Comacchio	NORTHING:	Refer Site Plan
JOB NO.:	GE13574-23	DRILLER:	CD & DM	SURFACE:	N.A
LOCATION:	Loch Sport	INCLINATION:	Vertical	LOGGED:	AGM DATE: 22/01/24
DATE DRILLED:	22/01/2024	HOLE DEPTH:	10.50 m	CHECKED:	AT DATE: 15/02/24

DRILLING METHOD	WATER	DEPTH (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	DPBH BLOWS PER 200mm	FIELD TESTING AND ADDITIONAL NOTES	SAMPLING
		0.00									CBR (%)	0.00
			0.30		FILL	FILL: Silty Sand, pale grey, presence of gravels and pebbles, fine to medium-grain, angular, rounded brown, up to 20mm	M	MC	6			
									10			
									5			
		0.50			SP	SAND, poorly graded, dark grey, fine to medium grain, medium dense, moist, trace of silt and fine gravels	M	L	3			
									3			0.50
		1.00							MD	4		
									4			
		1.20				Grades: pale grey, creamy white, fine to coarse grain			6			
									5			1.00
		1.50	1.50			Grades: trace of tree roots, dark brown		L	1			
									2			1.50
		1.70				Grades: groundwater observed @ 1.7m			3		SPT @ 1.5m 2,3,4 N=7	
							W					
		2.00										2.00
		2.50	2.50			Grades: dark brown mottled dark grey						2.50
		3.00	3.00			Grades: dark grey		MD			SPT @ 3.0m 3,4,6 N=10	3.00
		3.50										3.50
		4.00	4.00			Grades: green mottled grey, medium to coarse grain						4.00
		4.50									SPT @ 4.5m 6,7,7 N=14	4.50
		5.00										5.00

STANDARD: AS 1289.6.3.2-1997 & AS 1726-2017

CONSISTENCY:

VS VERY SOFT
S SOFT
F FIRM
ST STIFF
VST VERY STIFF
H HARD

RELATIVE DENSITY:

VL VERY LOOSE
L LOOSE
MD MEDIUM DENSE
D DENSE
VD VERY DENSE

COMPACTION:

WC WELL COMPACTED
MC MODERATELY COMPACTED
PC POORLY COMPACTED

MOISTURE:

D DRY
M MOIST
W WET

SAMPLING/ IN-SITU TESTING:

INTACT CORE SAMPLE
INTACT TUBE SAMPLE
DISTURBED SAMPLE
DISTURBED BULK SAMPLE
HAMMER BOUNCING
POCKET PENETROMETER

STANDARD PENETRATION TEST (SPT)
HSV FIELD VANE SHEAR TEST (UNCORRECTED)
DCP DYNAMIC CONE PENETRATION TEST
CPT CONTINUOUS CONE PENETRATION TEST

WATER:

WATER LEVEL
WATER LEVEL RISEN TO
WATER INFLOW
WATER LOSS



BOREHOLE LOG

BH NO.: BH1

SHEET: 3 OF 3

CLIENT:	BMT Commercial Australia	DRILLING CO.:	Rockwell Drilling	EASTING:	Refer Site Plan
PROJECT:	Seagull Drive Boat Ramp	DRILL RIG:	Comacchio	NORTHING:	Refer Site Plan
JOB NO.:	GE13574-23	DRILLER:	CD & DM	SURFACE:	N.A
LOCATION:	Loch Sport	INCLINATION:	Vertical	LOGGED:	AGM DATE: 22/01/24
DATE DRILLED:	22/01/2024	HOLE DEPTH:	10.50 m	CHECKED:	AT DATE: 15/02/24

DRILLING METHOD	WATER	DEPTH (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	DCP BLOWS PER 100mm	DPH BLOWS PER 200mm	FIELD TESTING AND ADDITIONAL NOTES	SAMPLING
Wash Boring		10.00			SP	SAND, poorly graded, brown, fine to medium grain, medium dense	W	MD			CBR (%) 0 5 10 15 20 25 30 SPT @ 10.0m 7,6,9 N=15	0.00
		10.50	10.50			End of Borehole @ 10.5m Groundwater Encountered @ 1.7m						10.50

STANDARD: AS 1289.6.3.2-1997 & AS 1726-2017

CONSISTENCY:

VS VERY SOFT
S SOFT
F FIRM
ST STIFF
VST VERY STIFF
H HARD

RELATIVE DENSITY:

VL VERY LOOSE
L LOOSE
MD MEDIUM DENSE
D DENSE
VD VERY DENSE

COMPACTION:

WC WELL COMPACTED
MC MODERATELY COMPACTED
PC POORLY COMPACTED

MOISTURE:

D DRY
M MOIST
W WET

SAMPLING/ IN-SITU TESTING:

INTACT CORE SAMPLE
T INTACT TUBE SAMPLE
D DISTURBED SAMPLE
B DISTURBED BULK SAMPLE
H.B. HAMMER BOUNCING
PP POCKET PENETROMETER

STANDARD PENETRATION TEST (SPT)
HSV FIELD VANE SHEAR TEST (UNCORRECTED)
DCP DYNAMIC CONE PENETRATION TEST
CPT CONTINUOUS CONE PENETRATION TEST

WATER:

WATER LEVEL
WATER LEVEL RISEN TO
WATER INFLOW
WATER LOSS

Appendix B– Laboratory Test Results

Material Test Report

Report Number: L3005-1
Issue Number: 1
Date Issued: 06/02/2024
Client: Geotesta Pty Ltd (Melbourne Office)

Contact: Abishek G Martin
Project Number: L3005
Project Name:
Project Location: Seagull Drive Boat Ramp, Loch Sport
Client Reference: GE 13574-23 - Docket 6522
Work Request: 1775
Sample Number: S-1775E
Date Sampled: 23/01/2024
Dates Tested: 24/01/2024 - 01/02/2024
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection: Selected by Client
Sample Location: BH1, Depth: 5.00-5.50m
Material: SAND with gravel and silt, brown grey and white



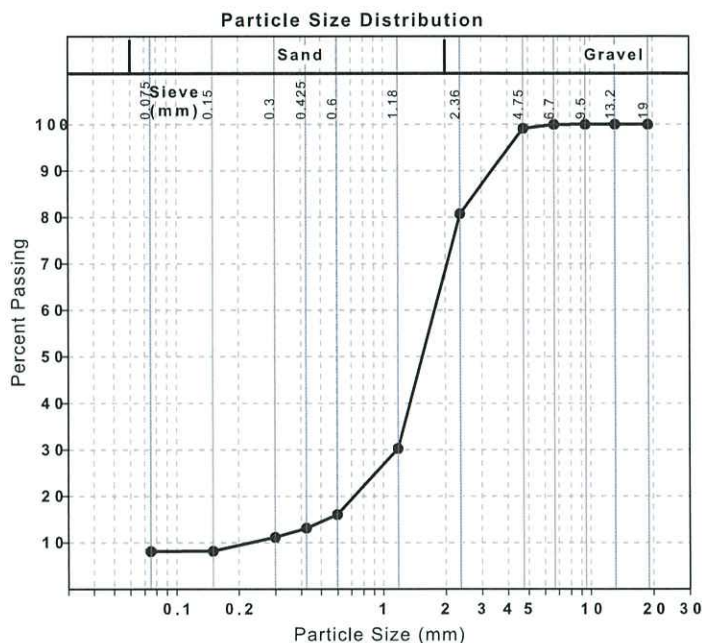
Geotesta Pty Ltd
Melbourne Laboratory
9 Redwood Drive Notting Hill VIC 3168
Phone: 1300 852 216
Email: info@geotesta.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Michael Chen
Clean Lab Manager
NATA Accredited Laboratory Number: 19167

Particle Size Distribution (AS1289 3.6.1)				
Sieve	Passed %	Passing Limits	Retained %	Retained Limits
19 mm	100		0	
13.2 mm	100		0	
9.5 mm	100		0	
6.7 mm	100		0	
4.75 mm	99		1	
2.36 mm	81		18	
1.18 mm	30		50	
0.6 mm	16		14	
0.425 mm	13		3	
0.3 mm	11		2	
0.15 mm	8		3	
0.075 mm	8		0	
Moisture Content (AS1289.2.1.1)				
			Min	Max
Moisture Content (%)			5.8	



Geotesta P/L
Level 1, 7 Business Park Drive,
Notting Hill
VIC 3168



NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: Dasun Premachandra

Report 1061623-S
Project name Seagull Drive Loch Sport
Project ID GE13574
Received Date Jan 23, 2024

Client Sample ID			L1 0.8M	L1 1.3M	L2 0.8M	L2 1.3M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M24-Ja0032472	M24-Ja0032473	M24-Ja0032474	M24-Ja0032475
Date Sampled			Jan 22, 2024	Jan 22, 2024	Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.5	5.5	6.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.3	2.1	2.3	2.2
Reaction Ratings* ^{S05}	0	comment	4.0	4.0	4.0	4.0
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	6.2	5.0	5.9	6.0
Titrateable Actual Acidity (NLM-3.2)	2	mol H+/t	< 2	< 2	< 2	< 2
Titrateable Actual Acidity (NLM-3.2)	0.003	% pyrite S	< 0.003	< 0.003	< 0.003	< 0.003
Potential Acidity - Titrateable Peroxide						
pH-OX	0.1	pH Units	2.7	2.5	3.0	2.5
Titrateable Peroxide Acidity (s-TPA)	0.02	% pyrite S	< 0.02	0.06	< 0.02	0.06
Titrateable Peroxide Acidity (a-TPA)	2	mol H+/t	< 2	36	< 2	39
Titrateable Sulfidic Acidity (a-TSA)	2	mol H+/t	< 2	36	< 2	39
Titrateable Sulfidic Acidity (s-TSA)	0.02	% pyrite S	< 0.02	0.06	< 0.02	0.06
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	0.021	0.025	0.014	0.031
Peroxide Extractable Sulfur	0.005	% S	0.14	0.21	0.081	0.24
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A
Potential Acidity (SPOS)						
Peroxide Oxidisable Sulfur (s-SPOS) (NLM 2.2)	0.005	% S	0.12	0.19	0.067	0.21
Peroxide Oxidisable Sulfur (a-SPOS) (NLM 2.2)	2	mol H+/t	74	120	42	130
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (s-SNAS) NLM-4.1 ^{S02}	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Extractable Calcium						
Calcium - KCl Extractable	0.005	% Ca	0.024	0.011	0.011	0.022
Calcium - Peroxide	0.005	% Ca	0.030	0.015	0.016	0.031
Calcium - Acid Reacted	0.005	% Ca	0.006	< 0.005	< 0.005	0.010
Calcium - Acid Reacted (s-aCa)	0.005	% S	< 0.005	< 0.005	< 0.005	0.008
Calcium - Acid Reacted (a-aCa)	0.005	mol H+/t	2.7	< 0.005	< 0.005	4.7

Client Sample ID			L3 0.8M	L3 1.3M	BH1 2M	BH1 9M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M24-Ja0032476	M24-Ja0032477	M24-Ja0032478	M24-Ja0032479
Date Sampled			Jan 22, 2024	Jan 22, 2024	Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit				
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (s-SNAS) NLM-4.1 ^{SO2}	0.005	% S	N/A	N/A	-	-
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	-	-
Extractable Calcium						
Calcium - KCl Extractable	0.005	% Ca	0.031	0.059	-	-
Calcium - Peroxide	0.005	% Ca	0.035	0.069	-	-
Calcium - Acid Reacted	0.005	% Ca	< 0.005	0.010	-	-
Calcium - Acid Reacted (s-aCa)	0.005	% S	< 0.005	0.008	-	-
Calcium - Acid Reacted (a-aCa)	0.005	mol H+/t	< 0.005	4.9	-	-
Extractable Magnesium						
Magnesium - KCl Extractable	0.005	% Mg	0.008	0.008	-	-
Magnesium - Peroxide	0.005	% Mg	0.009	0.010	-	-
Magnesium - Acid Reacted	0.005	% Mg	< 0.005	< 0.005	-	-
Magnesium - Acid Reacted (s-aCa)	0.005	% S	< 0.005	< 0.005	-	-
Magnesium - Acid Reacted (a-aCa)	0.005	mol H+/t	< 0.005	< 0.005	-	-
Acid Neutralising Capacity (ANCE)						
Acid Neutralising Capacity - (ANCE)	0.02	% CaCO3	N/A	N/A	-	-
Acid Neutralising Capacity - (s-ANCE)	0.02	% S	N/A	N/A	-	-
Acid Neutralising Capacity - (a-ANCE)	10	mol H+/t	n/a	n/a	-	-
Acid Neutralising Capacity (ANCbt)						
ANC Fineness Factor		factor	1.5	1.5	-	-
Net Acidity (Including ANC)						
SPOCAS - Net Acidity - ASSMAC (Acidity Units)	10	mol H+/t	14	22	-	-
SPOCAS - Net Acidity - ASSMAC (Sulfur Units)	0.02	% S	0.02	0.04	-	-
SPOCAS - Liming rate - ASSMAC	1	kg CaCO3/t	1.0	1.6	-	-
Extraneous Material						
<2mm Fraction	0.005	g	210	220	-	-
>2mm Fraction	0.005	g	< 0.005	< 0.005	-	-
Analysed Material	0.1	%	100	100	-	-
Extraneous Material	0.1	%	< 0.1	< 0.1	-	-
Chloride	5	mg/kg	-	-	94	< 5
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	-	110	680
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	-	4.9	7.0
Resistivity*	0.5	ohm.m	-	-	92	15
Sulphate (as SO4)	30	mg/kg	-	-	< 30	< 30
Sample Properties						
% Moisture	1	%	-	-	6.1	16



ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

Melbourne		Geelong		Sydney		Canberra		Brisbane		Newcastle		Perth		Auckland		Auckland (Asb)		Christchurch		Tauranga	
6 Monterey Road		19/8 Lewalan Street		179 Magowar Road		Unit 1.2 Dacre Street		1/21 Smallwood Place		1/21 Frost Drive		46-48 Banksia Road		35 O'Rorke Road		Unit C1/4 Pacific Rise,		43 Detroit Drive		1277 Cameron Road,	
Dandenong South		Girraween		Girraween		Mitchell		Murarie		Mayfield West		Welshpool		Penrose,		Mount Wellington,		Rolleston,		Gate Pa,	
VIC 3175		VIC 3216		NSW 2145		ACT 2911		QLD 4172		NSW 2304		WA 6106		Auckland 1061		Auckland 1061		Christchurch 7675		Tauranga 3112	
+61 3 8564 5000		+61 3 8564 5000		+61 2 9900 8400		+61 2 6113 8091		T: +61 7 3902 4600		+61 2 4968 8448		NAT# 1261		+64 9 526 4551		+64 9 525 0568		+64 3 343 5201		+64 9 525 0568	
NAT# 1261		NAT# 1261		NAT# 1261		NAT# 1261		NAT# 1261		NAT# 1261		NAT# 2377		IANZH 1327		IANZH 1308		IANZH 1290		IANZH 1402	
Site# 1254		Site# 25403		Site# 18217		Site# 25466		Site# 20794		Site# 25079 & 25289		Site# 2370									

Company Name:

Address:

Geotesta P/L

Level 1, 7 Business Park Drive,

Notting Hill

VIC 3168

Project Name:

Project ID:

Seagull Drive Loch Sport

GE13574

Order No.:

Report #:

Phone:

Fax:

1061623

03 9562 8808

Received:

Due:

Priority:

Contact Name:

Jan 23, 2024 11:00 AM

Jan 31, 2024

5 Day

Dasun Premachandra

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Moisture Set					
Melbourne Laboratory - NATA # 1261 Site # 1254											
Brisbane Laboratory - NATA # 1261 Site # 20794											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	Aggressivity Soil Set					
1	L1 0.8M	Jan 22, 2024		Soil	M24-Ja0032472						
2	L1 1.3M	Jan 22, 2024		Soil	M24-Ja0032473						
3	L2 0.8M	Jan 22, 2024		Soil	M24-Ja0032474						
4	L2 1.3M	Jan 22, 2024		Soil	M24-Ja0032475						
5	L3 0.8M	Jan 22, 2024		Soil	M24-Ja0032476						
6	L3 1.3M	Jan 22, 2024		Soil	M24-Ja0032477						
7	BH1 2M	Jan 22, 2024		Soil	M24-Ja0032478						
8	BH1 9M	Jan 22, 2024		Soil	M24-Ja0032479						
Test Counts						6	2	6	2	6	2

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank										
Chloride				mg/kg	< 5			5	Pass	
Sulphate (as SO ₄)				mg/kg	< 30			30	Pass	
LCS - % Recovery										
Actual Acidity (NLM-3.2)										
pH-KCL (NLM-3.1)				%	99			80-120	Pass	
LCS - % Recovery										
Extractable Sulfur										
HCl Extractable Sulfur				%	107			80-120	Pass	
LCS - % Recovery										
Chloride				%	112			70-130	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)				%	97			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	M24-Ja0030627	NCP		pH Units	7.9	7.9	pass	20%	Pass	
Duplicate										
Actual Acidity (NLM-3.2)					Result 1	Result 2	RPD			
pH-KCL (NLM-3.1)	M24-Ja0032476	CP		pH Units	7.3	7.3	<1	20%	Pass	
Titrateable Actual Acidity (NLM-3.2)	M24-Ja0032476	CP		mol H+/t	< 2	< 2	<1	20%	Pass	
Titrateable Actual Acidity (NLM-3.2)	M24-Ja0032476	CP		% pyrite S	< 0.003	< 0.003	<1	30%	Pass	
Duplicate										
Potential Acidity - Titrateable Peroxide					Result 1	Result 2	RPD			
pH-OX	M24-Ja0032476	CP		pH Units	3.0	3.0	<1	20%	Pass	
Titrateable Peroxide Acidity (s-TPA)	M24-Ja0032476	CP		% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Titrateable Peroxide Acidity (a-TPA)	M24-Ja0032476	CP		mol H+/t	< 2	< 2	<1	20%	Pass	
Titrateable Sulfidic Acidity (a-TSA)	M24-Ja0032476	CP		mol H+/t	< 2	< 2	<1	30%	Pass	
Titrateable Sulfidic Acidity (s-TSA)	M24-Ja0032476	CP		% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Duplicate										
Extractable Sulfur					Result 1	Result 2	RPD			
Sulfur - KCl Extractable	M24-Ja0032476	CP		% S	0.019	0.019	1.8	30%	Pass	
Peroxide Extractable Sulfur	M24-Ja0032476	CP		% S	0.086	0.087	<1	20%	Pass	
HCl Extractable Sulfur	M24-Ja0032476	CP		% S	N/A	N/A	N/A	20%	Pass	
Duplicate										
Potential Acidity (SPOS)					Result 1	Result 2	RPD			
Peroxide Oxidisable Sulfur (s-SPOS) (NLM 2.2)	M24-Ja0032476	CP		% S	0.067	0.068	1.3	30%	Pass	
Peroxide Oxidisable Sulfur (a-SPOS) (NLM 2.2)	M24-Ja0032476	CP		mol H+/t	42	42	1.3	30%	Pass	
Duplicate										
Retained Acidity (S-NAS)					Result 1	Result 2	RPD			
Net Acid soluble sulfur (s-SNAS) NLM-4.1	M24-Ja0032476	CP		% S	N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur (a-SNAS) NLM-4.1	M24-Ja0032476	CP		mol H+/t	N/A	N/A	N/A	30%	Pass	
Duplicate										
Extractable Calcium					Result 1	Result 2	RPD			
Calcium - KCl Extractable	M24-Ja0032476	CP		% Ca	0.031	0.031	<1	30%	Pass	
Calcium - Peroxide	M24-Ja0032476	CP		% Ca	0.035	0.034	2.9	20%	Pass	
Calcium - Acid Reacted	M24-Ja0032476	CP		% Ca	< 0.005	< 0.005	<1	30%	Pass	
Calcium - Acid Reacted (s-aCa)	M24-Ja0032476	CP		% S	< 0.005	< 0.005	<1	30%	Pass	
Calcium - Acid Reacted (a-aCa)	M24-Ja0032476	CP		mol H+/t	< 0.005	< 0.005	<1	30%	Pass	

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight, 2.0; Moderate reaction, 3.0; Strong reaction with persistent froth, 4.0; Extreme reaction.

Authorised by:

Amy Meunier	Analytical Services Manager
Jonathon Angell	Senior Analyst-SPOCAS
Mary Makarios	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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1 Introduction

Geotesta was commissioned by BMT Commercial Australia Pty Ltd to conduct a Preliminary Coastal Acid Sulfate Soil (CASS) Investigation at Seagull Drive in Lock Sport. This CASS Report outlines the CASS hazard assessment using six samples taken from three locations along the proposed work area.

2 Limitations

This assessment was conducted according to Geotesta's proposal document PR13574-23, 15 December 2023. Professional advice and opinion provided in this report EP0444Rpt1.V1, February 2024 are for BMT Commercial Australia Pty Ltd requesting the work in accordance with the agreed scope of work.

Advice and interpretation are provided on the basis that subsequent site work will be undertaken by Geotesta. Should other parties be engaged to implement recommendations made by Geotesta, or undertake further assessment work on the site, Geotesta is not responsible for how the information in this report is used by those other parties or any other party.

A report is provided inclusive of all documentation sections, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

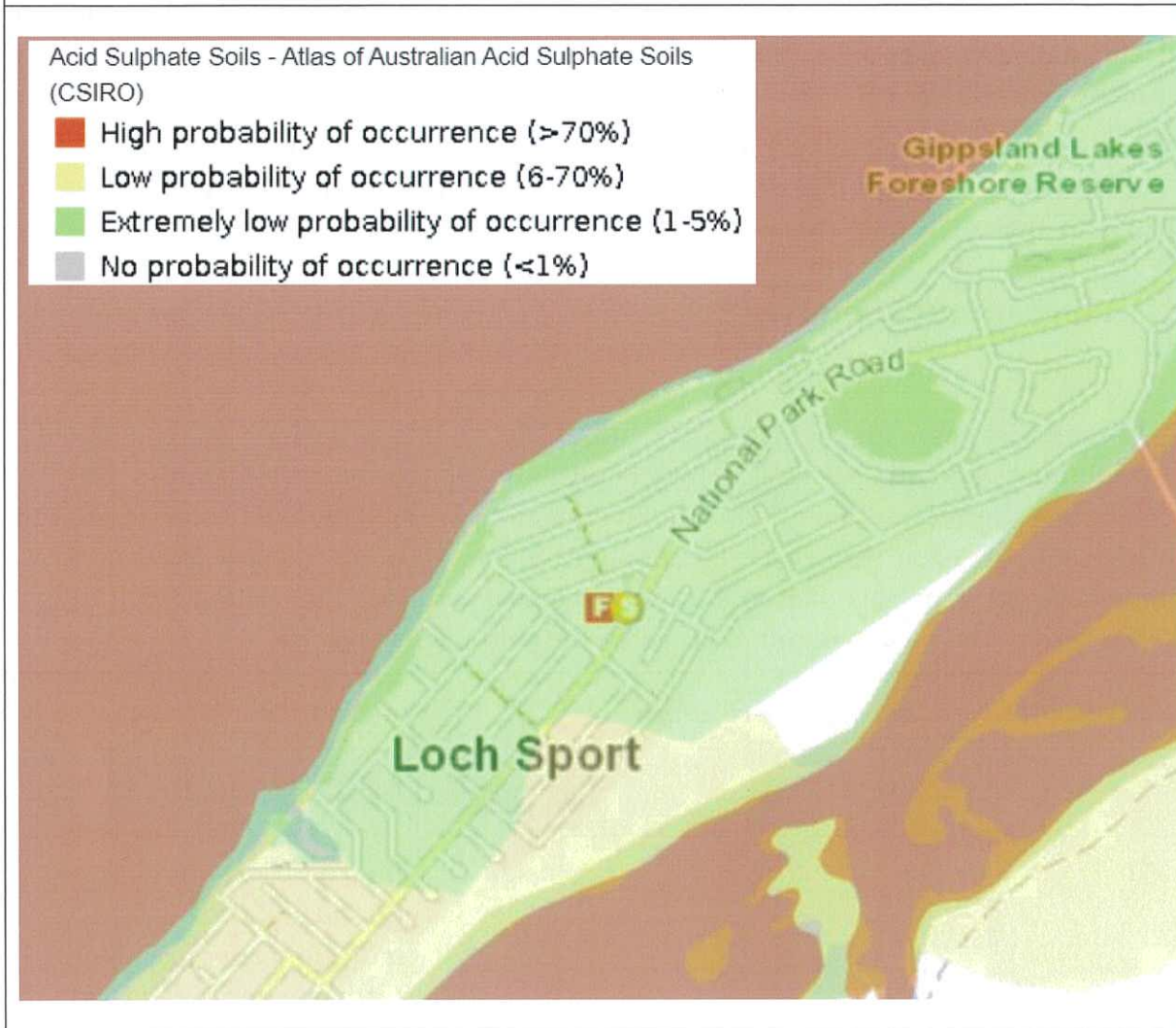
Sub-surface conditions can change by natural processes and site activities. This report presents the conditions assessed at the time the investigation/desk study was undertaken. Consequently, project decisions should not be based on environmental site assessment or data that may have been affected by time. The consultant should be requested to advise if additional information is required.

This site has been assessed for a particular proposed or existing land use based on the limitations of the scope of works. No warranty or guarantee is made regarding any other use, only to the depth tested. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the specified use.

3 Site Characteristics

3.1 Geology

The Geological Map of Gippsland indicates that the site is underlined by Inland Dune Deposits comprised of sand, silt and clay.

Figure 2. Acid Sulfate Soil Map

4 Investigation

4.1 Method of Investigation

The site inspection was carried out on 22 January 2024 by Geotesta. The position of sampling locations was selected along the proposed work area. The soil samples were collected using a hand auger and drilled to a depth of 1.6m from surface of the water. Two distinctive samples were taken from each location with a total of six samples.

5.2 SPOCAS Analysis

Quantitative laboratory analyses by SPOCAS suite in accordance with AS4969 were undertaken on selected samples to assess the level and nature of acidity or potential acidity present in the soil samples.

6 Laboratory Test Results

<i>Table 2. Field pH testing and SPOCAS results</i>							
Location	Depth(m)	pH _F	pH _{FOX}	ΔpH	Reaction Rate	Net Acidity (Sulfur Unit) %S	Net Acidity (Acidity Unit) mol H ⁺ /t
L1	0.8	5.8	2.3	3.2	4 (Extreme)	0.12	74
	1.3	5.5	2.1	3.4	4 (Extreme)	0.19	120
L2	0.8	5.5	2.3	3.2	4 (Extreme)	0.07	42
	1.3	6.2	2.2	4.0	4 (Extreme)	0.21	130
L3	0.8	6.7	2.6	4.1	4 (Extreme)	0.02	14
	1.3	6.5	2.2	4.3	4 (Extreme)	0.04	22

Field screen results indicate that pH field levels range between 5.5 to 6.7 with field oxidised pH levels ranging between 3.2 to 4.3. Reaction ratings were all extreme, however shell fragments observed during the investigation and responsive material such as calcium carbonate can influence the laboratory results. Results in Table 2 indicate generally mildly acidic conditions in the samples tested with additional testing (SPOCAS suite) required to confirm and the nature of the acidity.

Appendix A Laboratory Test Results

Client Sample ID			L1 0.8M	L1 1.3M	L2 0.8M	L2 1.3M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M24-Ja0032472	M24-Ja0032473	M24-Ja0032474	M24-Ja0032475
Date Sampled			Jan 22, 2024	Jan 22, 2024	Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit				
Extractable Magnesium						
Magnesium - KCl Extractable	0.005	% Mg	0.007	0.007	0.009	0.011
Magnesium - Peroxide	0.005	% Mg	0.008	0.007	0.009	0.014
Magnesium - Acid Reacted	0.005	% Mg	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium - Acid Reacted (s-aCa)	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium - Acid Reacted (a-aCa)	0.005	mol H+/t	< 0.005	< 0.005	< 0.005	< 0.005
Acid Neutralising Capacity (ANCE)						
Acid Neutralising Capacity - (ANCE)	0.02	% CaCO ₃	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCE)	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCE)	10	mol H+/t	n/a	n/a	n/a	n/a
Acid Neutralising Capacity (ANCbt)						
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
SPOCAS - Net Acidity - ASSMAC (Acidity Units)	10	mol H+/t	74	120	42	130
SPOCAS - Net Acidity - ASSMAC (Sulfur Units)	0.02	% S	0.12	0.19	0.07	0.21
SPOCAS - Liming rate - ASSMAC	1	kg CaCO ₃ /t	5.5	8.9	3.1	9.8
Extraneous Material						
<2mm Fraction	0.005	g	150	260	280	380
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			L3 0.8M	L3 1.3M	BH1 2M	BH1 9M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M24-Ja0032476	M24-Ja0032477	M24-Ja0032478	M24-Ja0032479
Date Sampled			Jan 22, 2024	Jan 22, 2024	Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.7	6.5	-	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.6	2.2	-	-
Reaction Ratings* ^{S05}	0	comment	4.0	4.0	-	-
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	7.3	8.2	-	-
Titrateable Actual Acidity (NLM-3.2)	2	mol H+/t	< 2	< 2	-	-
Titrateable Actual Acidity (NLM-3.2)	0.003	% pyrite S	< 0.003	< 0.003	-	-
Potential Acidity - Titrateable Peroxide						
pH-OX	0.1	pH Units	3.0	2.9	-	-
Titrateable Peroxide Acidity (s-TPA)	0.02	% pyrite S	< 0.02	< 0.02	-	-
Titrateable Peroxide Acidity (a-TPA)	2	mol H+/t	< 2	< 2	-	-
Titrateable Sulfidic Acidity (a-TSA)	2	mol H+/t	< 2	< 2	-	-
Titrateable Sulfidic Acidity (s-TSA)	0.02	% pyrite S	< 0.02	< 0.02	-	-
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	0.019	0.033	-	-
Peroxide Extractable Sulfur	0.005	% S	0.086	0.14	-	-
HCl Extractable Sulfur	0.005	% S	N/A	N/A	-	-
Potential Acidity (SPOS)						
Peroxide Oxidisable Sulfur (s-SPOS) (NLM 2.2)	0.005	% S	0.067	0.10	-	-
Peroxide Oxidisable Sulfur (a-SPOS) (NLM 2.2)	2	mol H+/t	42	65	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Brisbane	Feb 01, 2024	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
SPOCAS Suite			
SPOCAS Suite	Brisbane	Feb 01, 2024	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Feb 01, 2024	6 Week
- Method: LTM-GEN-7050/7070			
Chloride	Melbourne	Jan 27, 2024	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Melbourne	Jan 27, 2024	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Melbourne	Jan 27, 2024	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO ₄)	Melbourne	Jan 27, 2024	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
% Moisture	Melbourne	Jan 23, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
- For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
- Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	Colour: Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (bis-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

- Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Duplicate								
Extractable Magnesium				Result 1	Result 2	RPD		
Magnesium - KCl Extractable	M24-Ja0032476	CP	% Mg	0.008	0.008	<1	30%	Pass
Magnesium - Peroxide	M24-Ja0032476	CP	% Mg	0.009	0.009	1.9	20%	Pass
Magnesium - Acid Reacted	M24-Ja0032476	CP	% Mg	< 0.005	< 0.005	<1	30%	Pass
Magnesium - Acid Reacted (s-aCa)	M24-Ja0032476	CP	% S	< 0.005	< 0.005	<1	30%	Pass
Magnesium - Acid Reacted (a-aCa)	M24-Ja0032476	CP	mol H+/t	< 0.005	< 0.005	<1	30%	Pass
Duplicate								
Acid Neutralising Capacity (ANCE)				Result 1	Result 2	RPD		
Acid Neutralising Capacity - (ANCE)	M24-Ja0032476	CP	% CaCO ₃	N/A	N/A	N/A	30%	Pass
Acid Neutralising Capacity - (a-ANCE)	M24-Ja0032476	CP	mol H+/t	n/a	n/a	N/A	30%	Pass
Duplicate								
Acid Neutralising Capacity (ANCbt)				Result 1	Result 2	RPD		
ANC Fineness Factor	M24-Ja0032476	CP	factor	1.5	1.5	<1	30%	Pass
Duplicate								
Net Acidity (Including ANC)				Result 1	Result 2	RPD		
SPOCAS - Net Acidity - ASSMAC (Acidity Units)	M24-Ja0032476	CP	mol H+/t	14	14	1.3	30%	Pass
SPOCAS - Net Acidity - ASSMAC (Sulfur Units)	M24-Ja0032476	CP	% S	0.02	0.02	1.3	30%	Pass
SPOCAS - Liming rate - ASSMAC	M24-Ja0032476	CP	kg CaCO ₃ /t	1.0	1.1	1.3	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Chloride	M24-Ja0032478	CP	mg/kg	94	93	<1	30%	Pass
Conductivity (1:5 aqueous extract at 25 °C as rec.)	M24-Ja0032374	NCP	uS/cm	130	140	7.0	30%	Pass
pH (1:5 Aqueous extract at 25 °C as rec.)	M24-Ja0032374	NCP	pH Units	5.9	5.9	pass	30%	Pass
Resistivity*	M24-Ja0032374	NCP	ohm.m	79	74	7.0	30%	Pass
Sulphate (as SO ₄)	M24-Ja0032478	CP	mg/kg	< 30	< 30	<1	30%	Pass
Duplicate								
Sample Properties				Result 1	Result 2	RPD		
% Moisture	M24-Ja0031657	NCP	%	14	15	4.7	30%	Pass