FOUNDATION EARTH SCIENCES

ACID SULPHATE SOIL ASSESSMENT (ASSA)

Property Address

106 Wyee Road & 1496 Hue Hue Road, Wyee NSW

Prepared for

High Line Projects Pty Ltd

Date

January 2024

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ABBREVIATIONS

AASS	Actual Acid Sulphate Soils
AHD	Above Height Datum
ANC	Acid Neutralising Capacity
ASS	Acid Sulphate Soils
ASSMAC	Acid Sulphate Soils Management Advisory Committee
ASSMP	Acid Sulphate Soils Management Plan
BGL	Below Ground Level
DNR&M	Department of Natural resources and Mines
DO	Dissolved Oxygen
EC	Electric Conductivity
EIL	Ecological Investigation Level
EPA	Environmental Protection Authority
HIL	Health-based Investigation Level
LOR	Limit of reporting
NV	Neutralising Value
PASS	Potential Acid Sulphate Soils
POCAS	Peroxide Oxidation Combined Acidity and Sulphate
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance/Quality Control
QASSIT	Queensland Acid Sulphate Soils Investigation Team
SPOCAS	Suspended Peroxide Oxidation Combined Acidity and Sulphate
SPOS	Peroxide Oxidisable
TAA	Total Actual Acidity
TCLP	Toxicity Characteristic Leaching Procedure
TPA	Total Potential Acidity
TSA	Total Sulfidic Acidity
TSS	Total Suspended Solids
VENM	Virgin Excavated Natural Material

1.0 INTRODUCTION

Foundation Earth Sciences (FES) was appointed by High Line Projects Pty Ltd to prepare an Acid Sulphate Soil Assessment (ASSA) for the property located at 106 Wyee Road & 1496 Hue Hue Road, Wyee NSW ("the site"). The site is in located the City of Lake Macquarie area.

The site is currently occupied by two rural residential properties, with residential dwellings, storage sheds, unsealed driveways, dam, and large grassed areas. The proposal is to rezone the site into a commercial zoning (business zone) to enable the development of commercial uses. A supermarket will be a key component of the proposed development. The following uses are also being considered for the site; speciality retail, childcare, other potential commercial uses include medical centre, small office and bank etc.

An ASSA assessment is required as disturbances to Potential Acid Sulphate Soil (PASS) or Actual Acid Sulphate Soils, which may occur during construction and excavation works, can result in the formation of acid. The acid, once formed, could then damage infrastructure or harm ecological systems. The results of the field parameters from this assessment should only be used as a preliminary study to determine if further investigations are required. If results exceed the criteria, then further work, including an ASS Management Plan, may be required.

2.0 OBJECTIVES

The purpose of the ASS Assessment is to determine the presence or absence of ASS at the site. In the absence of ASS, it is essential to assess for the presence of Potential Acid Sulphate Soils (PASS). If the results do not meet criteria an Acid Sulphate Soil Management Plan will be required.

This assessment reviewed the presence of ASS / PASS in the portion of the site that may require excavation.

3.0 SCOPE OF WORKS

The scope of works of the PASSA included:

- Review of previous environmental assessments;
- Site walkover;
- Targeted soil boring, sampling and testing for ASS at the site;
- Interpretation of field test analysis and findings; and
- Reporting in accordance with relevant assessment guidelines / regulations.

4.0 ASSESSMENT CRITERIA

When assessing ASS at sites in NSW, the Acid Sulphate Soils Management Advisory Committee 'Acid Sulphate Soil Manual' apply. The following national guidelines issued in June 2018 are also applicable:

- Australian Government Department of Agriculture and Water Resources (2018), National Acid Sulfate Soils Guidance – National Acid Sulfate Soil Sampling and Identification Methods Manual, June 2018.

The purpose of this report is to determine whether there is a probable risk associated with ASS or PASS and to determine whether these types of soils exist on the site.

This report has been prepared in accordance with the Acid Sulphate Soil Manual (1998) & National Acid Sulfate Soil Sampling and identification methods manual (2018).

Risk Map

A review of NSW Department of Land & Water Conservation (DLWC) Acid Sulphate Soil Risk Maps (Edition Two, December 1997, Scale 1:250,000) was undertaken**.** The risk maps do not detail the severity of the ASS, but only provide an indication that they may be present. The decision to classify certain areas as ASS is based on several geomorphic conditions and site criteria. The following points are used to determine if ASS is likely to exist (extracted from ASSMAC (1998) Acid Sulphate Soils Assessment Guidelines):

- Sediments of recent geological age (Holocene) ~ 10 000 yr.
- Soil horizons less than 5m AHD (Australian Height Datum).
- Marine or estuarine sediments and tidal lakes.
- In coastal wetlands or back swamp areas; waterlogged or scalded areas; interdune swales or coastal sand dunes.
- In areas where the dominant vegetation is mangroves, reeds, rushes and other swamp tolerant and marine vegetation.
- In areas identified in geological descriptions or in maps bearing sulphide minerals, coal deposits or former marine shales/sediments.
- Deeper older estuarine sediments >10m below the ground surface, Holocene or Pleistocene age.

A review of the “Hunter” map indicated that the site is in an area of “high probability within 0.5m of the ground surface” of acid sulphate soils within the soil profile.

A review of the Lake Macquarie Local Environmental Plan 2014 indicated the site is in Class 5 area of acid sulphate soil material within the soil profile.

Assessment Criteria

The following soil indicators are used to determine if AASS is present on a site:

- field pH ≤4 in soils
- presence of shell
- any jarosite horizons or substantial iron oxide mottling in auger holes, in surface encrustations or in any material dredged or excavated and left exposed. Jarosite is not always found, however, in actual acid sulphate soils.

The following soil indicators are used to determine if PASS is present on a site:

- waterlogged soils, unripe muds (soft, buttery, blue grey or dark greenish grey) or estuarine silty sands or sands (mid to dark grey) or bottom sediments of estuaries or tidal lakes (dark grey to black)
- presence of shell
- soil pH usually neutral but may be acid -positive Peroxide Test (see section 7.2 Field pH results).

5.0 SITE INFORMATION

5.1 Site Identification

The site is identified as follows:

Table 1: Site Identification Review

Site Identifier	Site Details	
Site Location	106 Wyee Road & 1496 Hue Hue Road, Wyee NSW	
Lot/DP	Lot 281 in DP 659927 – 106 Wyee Road Lot 282 in DP 755242 – 1496 Hue Hue Road	
Site Coordinates #	S Corner: Latitude: -33.176699, Longitude: 151.479469	
Site Area	Approximately 1.42ha	
Local Government Area (LGA)	City of Lake Macquarie	
Zoning##	RU4 – Primary Production Small Lots	
Surrounding Land Uses	*North*	Commercial/industrial and some rural residential
	South	Hue Hue Rd, Rural residential and vacant land
	East	Wyee Rd, commercial and fuel station then residential
	West	Rural residential

Notes: # Six Maps
refer to NSW Planning Portal

5.2 Topography

The topography viewed on NSW ESPADE indicated the following for the Doyalson Landscape.

5.3 Local Geology & Surface Waters

The 1:100,000 Geological map of Gosford – Lake Macquarie, published by NSW Government in 1998, indicates the soils within the site to be underlain by Triassic

Age Tuggerah Formation of the Narrabeen Group, comprising red, green and grey shale and quartz-lithic sandstone.

The nearest downgradient waterbody is Mannering Creek located approximately 200m south east of the site. There is also the Swampy creek located approximately 300m north of the site. There are many dams within & surrounding of the properties.

5.4 Proposed Development

The site currently is occupied by two rural residential properties, each with a residential dwelling, storage shed, unsealed driveway, dams, and large grassed areas. The proposal is to rezone the site to a commercial zoning (business zone) to enable the development of commercial uses. A supermarket will be a key component of the proposed development. The following uses are also being considered for the site; speciality retail, childcare, other potential commercial uses include medical centre, small office and bank etc.

5.5 Previous Reports

- No previous acid sulphate soil reports were available for this site.

6.0 SOIL BORING AND SAMPLING

A soil sampling and analysis program was used to consolidate the nature and degree of Acid Sulphate Soils present in the surface and subsurface geology. Samples were collected from six (6) test pits within the site. The borehole locations are presented in **Figure 2** – Site Features and Borehole Location Plan.

Field analysis was performed on the collected samples for pH_f and pH_{fox} in accordance with the required sampling techniques outlined in the Acid Sulfate Soil Manual *(ASSMAC 1998).* This included the Field pH and peroxide test protocol.

6.1 Quality Assurance/Quality Control (QA/QC)

Standard QA/QC procedures were followed.

Standard sampling and analysing procedures are in accordance with and set out in the Acid Sulphate Soil Manual (1998) and Australian Government Department of Agriculture and Water Resources (2018), National Acid Sulfate Soils Guidance – National acid sulfate soil sampling and identification methods manual, June 2018.

7.0 FIELD RESULTS

7.1 Soil Observations

Based on information from all boreholes, the surface and sub-surface profile across the site is generalised as follows:

- Topsoil or Fill: Silty Clay;
- Natural: Silty CLAY;

No unusual colouring or shells were detected in the soil. This suggests the presence of pyrite (iron sulphide) or jarosite was unlikely.

Refer to **Appendix A** – Borehole Logs.

7.2 Field pH Results

The results of the field pH tests are presented in the table below:

Table 2: Summary of field analysis results

Sample	Depth (m)	pH		pH		Change in pH (pH_f – pH_{fox})	Effervescence Reaction Rate
		H_2O	Soil pH_f	H_2O_2	Soil pH_{fox}		
ASSA1-1	0.0-0.1	-	7.4	-	4.9	**2.5**	Medium
ASSA1-2	0.4-0.5	-	7.2	-	5.4	1.8	Medium
ASSA1-3	0.9-1.0	-	5.4	-	4.6	0.8	Low
ASSA1-4	1.4-1.5	-	5.3	-	4.1	1.2	Medium
ASSA1-5	1.9-2.0	-	5.1	-	4.1	1.0	Medium
ASSA1-6	2.4-2.5	-	5.1	-	3.9	1.2	Medium
ASSA1-7	2.9-3.0	-	5.1	-	4.0	1.1	Medium
ASSA2-1	0.0-0.1	-	6.5	-	3.6	**2.9**	**High**
ASSA2-2	0.4-0.5	-	6.4	-	3.9	2.5	Medium
ASSA2-3	0.9-1.0	-	5.9	-	4.4	1.5	Medium
ASSA2-4	1.4-1.5	-	5.5	-	4.1	1.4	Medium
ASSA2-5	1.9-2.0	-	5.4	-	4.2	1.2	Medium
ASSA2-6	2.4-2.5	-	5.2	-	3.6	1.6	Medium
ASSA2-7	2.9-3.0	-	5.3	-	**3.3**	**2.0**	**High**
ASSA3-1	0.0-0.1	-	7.8	-	5.4	**2.4**	Medium
ASSA3-2	0.4-0.5	-	6.9	-	**2.8**	**4.1**	**Extreme**
ASSA3-3	0.9-1.0	-	6.0	-	**3.5**	**2.5**	Medium
ASSA3-4	1.4-1.5	-	5.6	-	3.6	**2.0**	Medium
ASSA3-5	1.9-2.0	-	5.0	-	4.0	1.0	Medium
ASSA3-6	2.4-2.5	-	5.4	-	**3.5**	1.9	Medium
ASSA3-7	2.9-3.0	-	5.5	-	3.8	1.7	Medium
ASSA4-1	0.0-0.1	-	5.7	-	**3.0**	**2.7**	**high**
ASSA4-2	0.4-0.5	-	5.4	-	3.7	1.7	Medium
ASSA4-3	0.9-1.0	-	5.6	-	3.9	1.7	Medium
ASSA4-4	1.4-1.5	-	5.4	-	4.0	1.4	Medium

ASSA4-5	1.9-2.0	-	5.3	-	3.9	1.4	Medium
ASSA4-6	2.4-2.5	-	5.4	-	3.7	1.7	Medium
ASSA4-7	2.9-3.0	-	5.3	-	3.6	1.7	Medium
ASSA5-1	0.0-0.1	-	4.7	-	**3.0**	1.7	**high**
ASSA5-2	0.4-0.5	-	5.2	-	3.6	1.6	Medium
ASSA5-3	0.9-1.0	-	5.1	-	3.7	1.4	Medium
ASSA5-4	1.4-1.5	-	5.1	-	**3.4**	1.7	Medium
ASSA5-5	1.9-2.0	-	5.0	-	3.6	1.4	Medium
ASSA5-6	2.4-2.5	-	5.0	-	4.6	0.4	Medium
ASSA5-7	2.9-3.0	-	5.2	-	4.3	0.9	Medium
ASSA6-1	0.0-0.1		4.8		**2.6**	**2.2**	**Extreme**
ASSA6-2	0.4-0.5		4.4		**3.4**	1.0	Medium
ASSA6-3	0.9-1.0		5.2		**3.5**	1.7	Medium
ASSA6-4	1.4-1.5		5.2		3.9	1.3	Medium
ASSA6-5	1.9-2.0		5.3		3.9	1.4	Medium
ASSA6-6	2.4-2.5		5.2		4.3	0.9	Medium
ASSA6-7	2.9-3.0		5.1		3.9	1.2	Medium

Notes:

- pH_f refers to pH field (soil and distilled H_2O).
- pH_{fox} refers to pH field oxidised (soil and peroxide).
- Change in pH refers to pH field minus pH field oxidised.
- **Highlighted** refers to detections.

8.0 SUSPENDED PEROXIDE OXIDATION COMBINED ACIDITY & SULPHATE (SPOCAS) RESULTS

Following the field tests undertaken by FES (administered Envirolab), four (4) soil samples from FES (collected from 12th October 2023) were submitted to the NATA certified laboratory of Envirolab for the SPOCAS test.

The soils were assessed against the guidelines set out in Acid Sulphate Soils Management Advisory Committee (ASSMAC) (2008) *Acid Sulphate Soils Assessment Guidelines*. The action criteria selected was based on excavation of more than 1,000 tonnes of soils disturbed within the site. The results are assessed against the available criteria, those being:

Coarse Texture Soils

- Sulphur Trail (S_{pos}) = 0.03%
- Acid Trail (TPA) = 18 mol H^+/tonne

Medium Texture Soils

- Sulphur Trail (S_{pos}) = 0.03%
- Acid Trail (TPA) = 36 mol H^+/tonne

The laboratory analysis results are presented in the following table:

Table 3: Laboratory Results - SPOCAS

Sample	Profile	Depth (m)	S-POS (%) (sulphur trail)	TAA (mol H^+/ tonne)	TPA (mol H^+/ tonne) (acid trail)	TSA (mol H^+/tonne) (acid trail)	Lime Calculation (kg $CaCO_3$/t includes 1.5 safety factor).
Sampling dated 12th October 2023							
ASSA2-7	Natural-Silty CLAY	2.9-3.0	<0.005	54	**57**	<5	4.3
ASSA3-2	Fill-Silty Clay	0.5-0.6	0.02	7	**44**	**37**	1.2
ASSA5-4	Natural-Silty CLAY	1.5-1.6	<0.005	55	**63**	8	4.2
ASSA6-1	Topsoil-Silty Clay	0.0-0.1	**0.04**	55	**130**	**71**	6.2
ASSMAC Guidelines Fine Texture		**-**	***0.03***	**-**	***18***	***18***	**-**

Notes:

- Guidelines follow the ASSMAC "Acid Sulphate Soils Assessment Guidelines 1998".
- Fine Texture Criteria based upon clay content of > or equal to 40%
- Medium Texture Criteria based upon clay content of 5-40%
- Criteria based upon less than 1000 tonnes disturbed
- **Bold values exceed ASSMAC guidelines**

When comparing the results summarised above in Table 3 to Table 4.4 (ASSMAC) for fine to medium texture soils, it can be determined that the percentage of oxidisable Sulphur (SPOS) did exceed the action criteria in BH6/ASSA6-1 (0.0-0.1m).

The Acid trail (TPA/TSA) results were below the action criteria with the exception of TPA in all tested borehole locations and for TSA in BH3/ASSA3-2 (0.5-0.6m) & BH6/ASSA6-1 (0.0-0.1m).

9.0 CHROMIUM REDUCIBLE SULPHUR RESULTS

Chromium Reducible sulphur method calculates the potential acidity from analysis of sulphide content. This method does not include sulphur from organics and sulphates (e.g. gypsum) and detects as low sulphide content and is therefore suitable to determine potential interferences caused by naturally occurring acidity within the soils. The laboratory results are presented in the following table:

Table 4: Laboratory Results – Chromium Reducible Sulphur

Sample	Depth	Chromium Reducible Sulphur (%)
Sampling dated 12TH October 2023		
ASSA2-7	2.9-3.0	<0.005
ASSA3-2	0.5-0.6	<0.005
ASSA5-4	1.5-1.6	<0.005
ASSA6-1	0.0-0.1	<0.005
SPOS Action Criteria		**0.03**

The results from the Table 4 indicated the following:

- A lack of oxidisable sulphur compounds was detected within all the testpit locations.

10.0 DISCUSSION & RECOMMENDATION

The assessment of acid sulphate material can be quite complex and can have a lot of interferences associated with the test methods and soil matrix. The following points outline the evidence to support the site is ***NOT*** impacted to the maximum depth of sampling:

- Analysis using the field test showed the soil indicators to be absence for AASS;
- Analysis using the Chromium reducible suite indicated that no inorganic sulphur sources were present above the relevant action criteria.
- FES has concluded the existing acid trail may have been consistent with organic occurring materials within the soils.
- The site is located at an elevation of approximately 15-21m AHD according to Google Earth. Acid Sulphate Soils occur in soil horizons *less than 5m AHD*.

Therefore, it has been determined the site is ***NOT impacted by Acid*** **Sulphate Soils** within the borehole locations **BH1/ASSA1 to BH6/ASSA6** to a maximum depth of analysis. Therefore, an Acid Sulphate Soil Management plan (ASSMP) is not required for the site as it is not impacted with AASS/PASS to the maximum depth of analysis.

REFERENCES

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) (2018).
- Australian Government Department of Agriculture and Water Resources (2018), National Acid Sulfate Soils Guidance – National Acid Sulfate Soil Sampling and Identification Methods Manual, June 2018.
- Stone Y, Ahern C.R and Blunden B (1998), 'Acid Sulphate Soil Manual 1998', Acid Sulphate Soils Management Advisory Committee, Wollongbar, NSW, Australia.

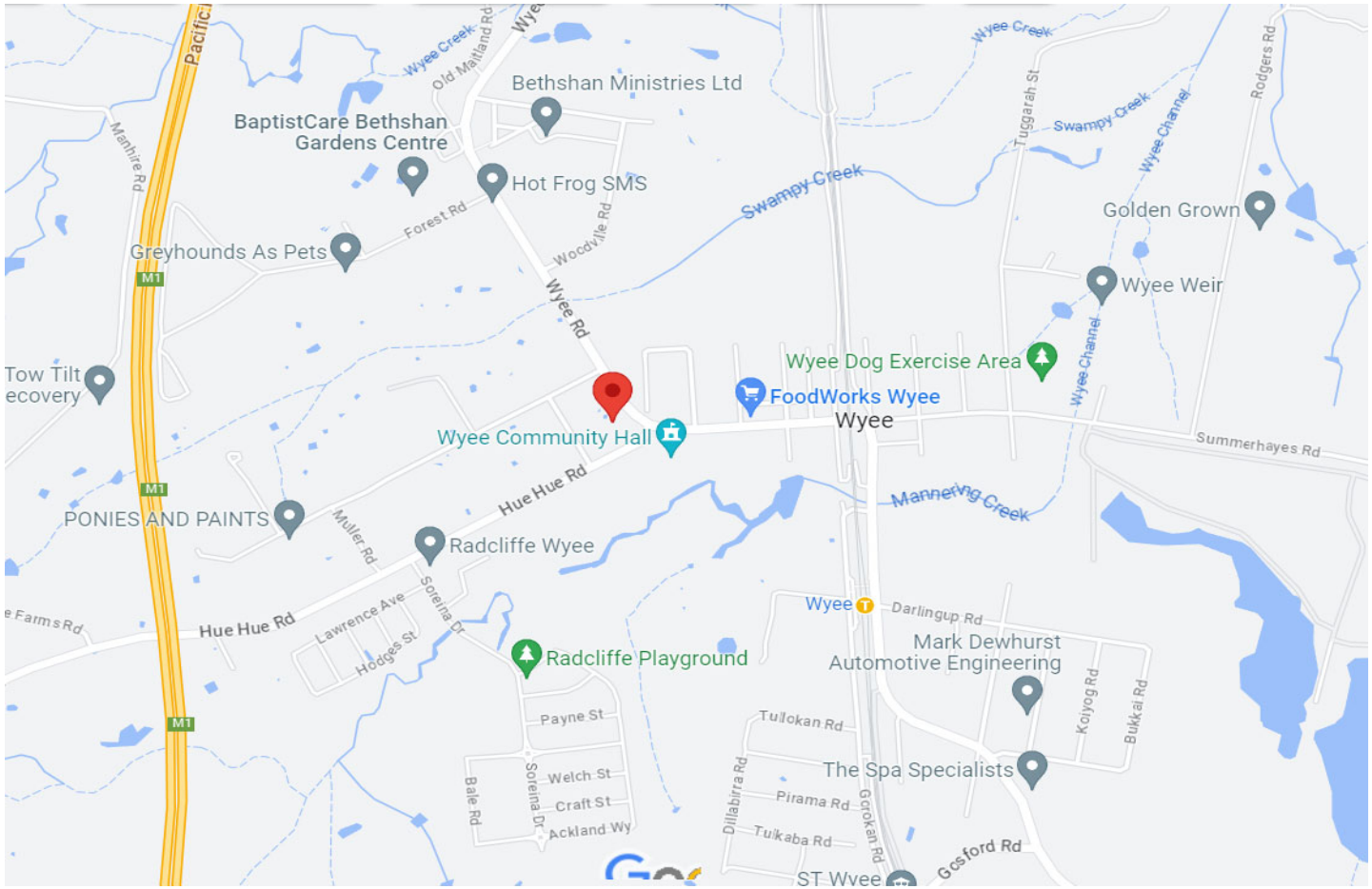
LIMITATIONS

Whilst to the best of our knowledge, information contained in this report is accurate at the date of issue, although subsurface conditions, including groundwater levels and contaminant concentrations, can change in a limited time. This should be borne in mind if the report is used after a protracted delay. There is always some disparity in subsurface conditions across a site that cannot be fully defined by investigation. Hence it is unlikely that measurements and values obtained from sampling and testing during environmental works carried out at a site will characterise the extremes of conditions that exist within the site.

There is no investigation that is thorough enough to preclude the presence of material that presently or in the future, may be considered hazardous at the site. Since regulatory criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under different regulatory standards that require remediation.

Opinions are judgements that are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions. Although the information provided by an Acid Sulphate Soils Assessment and Management Plan can reduce exposure to risks, no assessment, however diligently carried out, can eliminate them. It must be noted that these findings are professional findings and have limitations. Even a rigorous professional assessment may fail to detect all ASS and/or PASS on a site. Sulphates may be present in areas that were not surveyed or sampled.

FIGURE 1: LOCALITY MAP



Key Site Location	FOUNDATION EARTH SCIENCES	**DRAWN** RW	**SITE LOCALITY**
		FIGURE 1	Acid Sulphate Soil Assessment
		Job # E3124-2	106 Wyee road & 1496 Hue Hue Road, Wyee NSW

FIGURE 2: SITE FEATURES AND BOREHOLE LOCATION PLAN

Feature No	Details
a	Residential House
b	Storage Shed
c	Unsealed Driveway
d	Grassed Area
e	Former Dam

Key

Site Location

FES test pit Soil Location 2023

FOUNDATION EARTH SCIENCES

DRAWN RW	**Site Features and Borehole Location Plan**
Figure 2	Acid Sulphate Soil Assessment
Job # E3124-2	1496 Hue Hue Road & 106 Wyee Road, Wyee NSW

APPENDIX A: BOREHOLE LOGS

FOUNDATION EARTH SCIENCES

BOREHOLE : BH1/ASSA1

CLIENT NAME: High Line Projects Pty Ltd **JOB NUMBER:** E3124-2

SITE ADDRESS: 106 Wyee Road & 1496 Hue Hue Road, Wyee NSW **PROJECT:** Acid Sulphate Soil Assesment

Date Started : 13/10/2023 **Completed :** 13/10/2023 **Logged By :** RW **Checked By :** MS

Borehole Location : Refer to Site Plan **Surface RL :** --- **Datum :** m AHD

Equipment : 5 Tonne Excavator **Borehole Size :** 2m x 0.5m **Slope :** -90°

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Consistence	Samples Tests Remarks	Additional Observations	Depth (m)
E	Not encountered					TOPSOIL, Silty Clay, low plasticity, yellow/brown, with vegetable matter	M	S	0.0-0.1	- ASSA1/1	
			0.5								0.5
			0.50		CH	Silty CLAY, medium to high plasticity, white/red/yellow, with some rocks	M	St-Vst	0.5-0.6	ASSA1/2 Residual Soil	
			1.0						1.0-1.1	ASSA1/3	1.0
			1.5						1.5-1.6	ASSA1/4	1.5
			2.0						2.0-2.1	ASSA1/5	2.0
			2.5						2.5-2.6	ASSA1/6	2.5
			2.80		CH	Silty CLAY, medium to high plasticity, white/red/yellow, with ironstone bands	M	St-Vst	2.9-3.0	ASSA1/7	
			3.0								3.0
			3.00			Borehole BH1/ASSA1 terminated at 3.00m					
			3.5								3.5
			4.0								4.0

Comments:

D - Dry, M - Moist, W - Wet

VS - Very Soft, S - Soft, F - Firm, St - Stiff, VSt - Very Stiff, H - Hard

VL - Very Loose, L - Loose, MD - Medium Dense, D - Dense, VD - Very Dense

FOUNDATION EARTH SCIENCES

BOREHOLE : BH2/ASSA2

CLIENT NAME: High Line Projects Pty Ltd **JOB NUMBER:** E3124-2

SITE ADDRESS: 106 Wyee Road & 1496 Hue Hue Road, Wyee NSW **PROJECT:** Acid Sulphate Soil Assesment

Date Started : 13/10/2023 **Completed :** 13/10/2023 **Logged By :** RW **Checked By :** MS

Borehole Location : Refer to Site Plan **Surface RL :** --- **Datum :** m AHD

Equipment : 5 Tonne Excavator **Borehole Size :** 2m x 0.5m **Slope :** -90°

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Consistence	Samples Tests Remarks	Additional Observations	Depth (m)
E	Not encountered		0.40			TOPSOIL, Silty Clay, low plasticity, yellow/brown, with vegetable matter and rocks	M	S	0.0-0.1	- ASSA2/1	
			0.5		CH	Silty CLAY, medium plasticity, white/orange	M	St	0.5-0.6	Residual Soil ASSA2/2	0.5
			1.0						1.0-1.1	ASSA2/3	1.0
			1.30		CH	Silty CLAY, medium to high plasticity, white/red/yellow, with some rocks	M	St-Vst		Residual Soil	
			1.5						1.5-1.6	ASSA2/4	1.5
			2.0						2.0-2.1	ASSA2/5	2.0
			2.5						2.5-2.6	ASSA2/6	2.5
			2.80		CH	Silty CLAY, medium to high plasticity, white/red/yellow, with ironstone bands	M	St-Vst		Residual Soil	
			3.0						2.9-3.0	ASSA2/7	3.0
			3.00			Borehole BH2/ASSA2 terminated at 3.00m					
			3.5								3.5
			4.0								4.0

Comments:

D - Dry, M - Moist, W - Wet

VS - Very Soft, S - Soft, F - Firm, St - Stiff, VSt - Very Stiff, H - Hard

VL - Very Loose, L - Loose, MD - Medium Dense, D - Dense, VD - Very Dense

BOREHOLE : BH3/ASSA3

FOUNDATION EARTH SCIENCES

CLIENT NAME: High Line Projects Pty Ltd **JOB NUMBER:** E3124-2

SITE ADDRESS: 106 Wyee Road & 1496 Hue Hue Road, Wyee NSW **PROJECT:** Acid Sulphate Soil Assesment

Date Started : 13/10/2023 **Completed :** 13/10/2023 **Logged By :** RW **Checked By :** MS

Borehole Location : Refer to Site Plan **Surface RL :** --- **Datum :** m AHD

Equipment : 5 Tonne Excavator **Borehole Size :** 2m x 0.5m **Slope :** -90°

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Consistence	Samples Tests Remarks	Additional Observations	Depth (m)
E	Not encountered		0.00			FILL, Silty Clay, low plasticity, light brown, with sand	M	S	0.0-0.1	- ASSA3/1	0.0
			0.20			FILL: Silty CLAY, low to medium plasticity, dark grey, with some rocks	M	S-F		-	
			0.5						0.5-0.6	ASSA3/2	0.5
			0.70		CH	Silty CLAY, high plasticity, orange/white	M	St-Vst		Residual Soil	
			1.0						1.0-1.1	ASSA3/3	1.0
			1.5						1.5-1.6	ASSA3/4	1.5
			2.0						2.0-2.1	ASSA3/5	2.0
			2.40		CH	Silty CLAY, high plasticity, orange/white, with ironstone bands	M	St-Vst		Residual Soil	
			2.5						2.5-2.6	ASSA3/6	2.5
			3.0						2.9-3.0	ASSA3/7	3.0
			3.00			Borehole BH3/ASSA3 terminated at 3.00m					
			3.5								3.5
			4.0								4.0

Comments:

D - Dry, M - Moist, W - Wet

VS - Very Soft, S - Soft, F - Firm, St - Stiff, VSt - Very Stiff, H - Hard

VL - Very Loose, L - Loose, MD - Medium Dense, D - Dense, VD - Very Dense

BOREHOLE : BH4/ASSA4

FOUNDATION EARTH SCIENCES

CLIENT NAME: High Line Projects Pty Ltd **JOB NUMBER:** E3124-2

SITE ADDRESS: 106 Wyee Road & 1496 Hue Hue Road, Wyee NSW **PROJECT:** Acid Sulphate Soil Assesment

Date Started : 13/10/2023 **Completed :** 13/10/2023 **Logged By :** RW **Checked By :** MS

Borehole Location : Refer to Site Plan **Surface RL :** --- **Datum :** m AHD

Equipment : 5 Tonne Excavator **Borehole Size :** 2m x 0.5m **Slope :** -90°

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Consistence	Samples Tests Remarks	Additional Observations	Depth (m)
E	Not encountered		0.00			FILL, Silty Clay, low plasticity, light brown, with sand	M	S	0.0-0.1	- ASSA4/1	
			0.30			FILL: Silty CLAY, low to medium plasticity, dark grey, with some rocks	M	S-F	0.5-0.6	- ASSA4/2	0.5
			0.70		CH	Silty CLAY, high plasticity, orange/white	M	St-Vst	1.0-1.1	Residual Soil ASSA4/3	1.0
			1.5						1.5-1.6	ASSA4/4	1.5
			2.0						2.0-2.1	ASSA4/5	2.0
			2.5								2.5
			2.50		CH	Silty CLAY, high plasticity, orange/white, with ironstone bands	M	St-Vst	2.5-2.6	Residual Soil ASSA4/6	
			3.0						2.9-3.0	ASSA4/7	3.0
			3.00			Borehole BH4/ASSA4 terminated at 3.00m					
			3.5								3.5
			4.0								4.0

Comments:

D - Dry, M - Moist, W - Wet

VS - Very Soft, S - Soft, F - Firm, St - Stiff, VSt - Very Stiff, H - Hard

VL - Very Loose, L - Loose, MD - Medium Dense, D - Dense, VD - Very Dense

BOREHOLE : BH5/ASSA5

FOUNDATION EARTH SCIENCES

CLIENT NAME: High Line Projects Pty Ltd **JOB NUMBER:** E3124-2

SITE ADDRESS: 106 Wyee Road & 1496 Hue Hue Road, Wyee NSW **PROJECT:** Acid Sulphate Soil Assesment

Date Started : 13/10/2023 **Completed :** 13/10/2023 **Logged By :** RW **Checked By :** MS

Borehole Location : Refer to Site Plan **Surface RL :** --- **Datum :** m AHD

Equipment : 5 Tonne Excavator **Borehole Size :** 2m x 0.5m **Slope :** -90°

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Consistence	Samples Tests Remarks	Additional Observations	Depth (m)
E	Not encountered		0.5			TOPSOIL, Silty Clay, low plasticity, light brown, with sand	M	S	0.0-0.1	- ASSA5/1	0.5
			0.50 1.0		CH	Silty CLAY, medium to high plasticity, orange/white	M	St-Vst	0.5-0.6	Residual Soil ASSA5/2	1.0
			1.5						1.0-1.1	ASSA5/3	1.5
			1.50 2.0		CH	Silty CLAY, high plasticity, orange/white, with ironstone bands	M	St-Vst	1.5-1.6	Residual Soil ASSA5/4	2.0
			2.5						2.0-2.1	ASSA5/5	2.5
			3.0						2.5-2.6	ASSA5/6	3.0
									2.9-3.0	ASSA5/7	
			3.00 3.5			Borehole BH5/ASSA5 terminated at 3.00m					3.5
			4.0								4.0

Comments:

D - Dry, M - Moist, W - Wet

VS - Very Soft, S - Soft, F - Firm, St - Stiff, VSt - Very Stiff, H - Hard

VL - Very Loose, L - Loose, MD - Medium Dense, D - Dense, VD - Very Dense

FOUNDATION EARTH SCIENCES

BOREHOLE : BH6/ASSA6

CLIENT NAME: High Line Projects Pty Ltd **JOB NUMBER:** E3124-2

SITE ADDRESS: 106 Wyee Road & 1496 Hue Hue Road, Wyee NSW **PROJECT:** Acid Sulphate Soil Assesment

Date Started : 13/10/2023 **Completed :** 13/10/2023 **Logged By :** RW **Checked By :** MS

Borehole Location : Refer to Site Plan **Surface RL :** --- **Datum :** m AHD

Equipment : 5 Tonne Excavator **Borehole Size :** 2m x 0.5m **Slope :** -90°

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Consistence	Samples Tests Remarks	Additional Observations	Depth (m)
E	Not encountered		0.5			TOPSOIL, Silty Clay, low plasticity, light brown, with sand	M	S	0.0-0.1 0.5-0.6	- ASSA6/1 ASSA6/2	0.5
			0.60		CH	Silty CLAY, medium to high plasticity, orange/white	M	St-Vst	1.0-1.1	Residual Soil ASSA6/3	1.0
			1.30		CH	Silty CLAY, high plasticity, orange/white, with ironstone bands	M	St-Vst	1.5-1.6 2.0-2.1 2.5-2.6 2.9-3.0	Residual Soil ASSA6/4 ASSA6/5 ASSA6/6 ASSA6/7	1.5 2.0 2.5 3.0
			3.00			Borehole BH6/ASSA6 terminated at 3.00m					3.5 4.0

Comments:

D - Dry, M - Moist, W - Wet

VS - Very Soft, S - Soft, F - Firm, St - Stiff, VSt - Very Stiff, H - Hard

VL - Very Loose, L - Loose, MD - Medium Dense, D - Dense, VD - Very Dense

APPENDIX B: NATA ACCREDITED LABORATORY CERTIFICATES

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 335237

Client Details

Client	Foundation Earth Sciences Pty Ltd
Attention	Michael Silk
Address	PO Box 4405, East Gosford, NSW, 2250

Sample Details

Your Reference	**E3124-2, Wyee**
Number of Samples	42 Soil
Date samples received	12/10/2023
Date completed instructions received	13/10/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	20/10/2023
Date of Issue	20/10/2023

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

sPOCAS field test						
Our Reference		335237-1	335237-2	335237-3	335237-4	335237-5
Your Reference	UNITS	ASSA1-1	ASSA1-2	ASSA1-3	ASSA1-4	ASSA1-5
Depth		0.0-0.1	0.5-0.6	1.0-1.1	1.5-1.6	2.0-2.1
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	7.4	7.2	5.4	5.3	5.1
pH_{FOX} (field peroxide test)	pH Units	4.9	5.4	4.6	4.1	4.1
Reaction Rate*	-	Medium reaction	Medium reaction	Low reaction	Medium reaction	Medium reaction

sPOCAS field test						
Our Reference		335237-6	335237-7	335237-8	335237-9	335237-10
Your Reference	UNITS	ASSA1-6	ASSA1-7	ASSA2-1	ASSA2-2	ASSA2-3
Depth		2.5-2.6	2.9-3.0	0.0-0.1	0.5-0.6	1.0-1.1
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	5.1	5.1	6.5	6.4	5.9
pH_{FOX} (field peroxide test)	pH Units	3.9	4.0	3.6	3.9	4.4
Reaction Rate*	-	Medium reaction	Medium reaction	High reaction	Medium reaction	Medium reaction

sPOCAS field test						
Our Reference		335237-11	335237-12	335237-13	335237-14	335237-15
Your Reference	UNITS	ASSA2-4	ASSA2-5	ASSA2-6	ASSA2-7	ASSA3-1
Depth		1.5-1.6	2.0-2.1	2.5-2.6	2.9-3.0	0.0-0.1
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	5.5	5.4	5.2	5.3	7.8
pH_{FOX} (field peroxide test)	pH Units	4.1	4.2	3.6	3.3	5.4
Reaction Rate*	-	Medium reaction	Medium reaction	Medium reaction	High reaction	Medium reaction

sPOCAS field test						
Our Reference		335237-16	335237-17	335237-18	335237-19	335237-20
Your Reference	UNITS	ASSA3-2	ASSA3-3	ASSA3-4	ASSA3-5	ASSA3-6
Depth		0.5-0.6	1.0-1.1	1.5-1.6	2.0-2.1	2.5-2.6
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	6.9	6.0	5.6	5.0	5.4
pH_{FOX} (field peroxide test)	pH Units	2.8	3.5	3.6	4.0	3.5
Reaction Rate*	-	Extreme reaction	Medium reaction	Medium reaction	Medium reaction	Medium reaction

sPOCAS field test						
Our Reference		335237-21	335237-22	335237-23	335237-24	335237-25
Your Reference	UNITS	ASSA3-7	ASSA4-1	ASSA4-2	ASSA4-3	ASSA4-4
Depth		2.9-3.0	0.0-0.1	0.5-0.6	1.0-1.1	1.5-1.6
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	5.5	5.7	5.4	5.6	5.4
pH_{FOX} (field peroxide test)	pH Units	3.8	3.0	3.7	3.9	4.0
Reaction Rate*	-	Medium reaction	High reaction	Medium reaction	Medium reaction	Medium reaction

sPOCAS field test						
Our Reference		335237-26	335237-27	335237-28	335237-29	335237-30
Your Reference	UNITS	ASSA4-5	ASSA4-6	ASSA4-7	ASSA5-1	ASSA5-2
Depth		2.0-2.1	2.5-2.6	2.9-3.0	0.0-0.1	0.5-0.6
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	5.3	5.4	5.3	4.7	5.2
pH_{FOX} (field peroxide test)	pH Units	3.9	3.7	3.6	3.0	3.6
Reaction Rate*	-	Medium reaction	Medium reaction	Medium reaction	High reaction	Medium reaction

sPOCAS field test						
Our Reference		335237-31	335237-32	335237-33	335237-34	335237-35
Your Reference	UNITS	ASSA5-3	ASSA5-4	ASSA5-5	ASSA5-6	ASSA5-7
Depth		1.0-1.1	1.5-1.6	2.0-2.1	2.5-2.6	2.9-3.0
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	5.1	5.1	5.0	5.0	5.2
pH_{FOX} (field peroxide test)	pH Units	3.7	3.4	3.6	4.6	4.3
Reaction Rate*	-	Medium reaction	Medium reaction	Medium reaction	Medium reaction	Medium reaction

sPOCAS field test						
Our Reference		335237-36	335237-37	335237-38	335237-39	335237-40
Your Reference	UNITS	ASSA6-1	ASSA6-2	ASSA6-3	ASSA6-4	ASSA6-5
Depth		0.0-0.1	0.5-0.6	1.0-1.1	1.5-1.6	2.0-2.1
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	4.8	4.4	5.2	5.2	5.3
pH_{FOX} (field peroxide test)	pH Units	2.6	3.4	3.5	3.9	3.9
Reaction Rate*	-	Extreme reaction	Medium reaction	Medium reaction	Medium reaction	Medium reaction

sPOCAS field test			
Our Reference		335237-41	335237-42
Your Reference	UNITS	ASSA6-6	ASSA6-7
Depth		2.5-2.6	2.9-3.0
Date Sampled		12.10.2023	12.10.2023
Type of sample		Soil	Soil
Date prepared	-	20/10/2023	20/10/2023
Date analysed	-	20/10/2023	20/10/2023
pH_F (field pH test)	pH Units	5.2	5.1
pH_{FOX} (field peroxide test)	pH Units	4.3	3.9
Reaction Rate*	-	Medium reaction	Medium reaction

Method ID	Methodology Summary
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			20/10/2023	[NT]	[NT]	[NT]	[NT]	20/10/2023	[NT]
Date analysed	-			20/10/2023	[NT]	[NT]	[NT]	[NT]	20/10/2023	[NT]
pH_F (field pH test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
pH_{FOX} (field peroxide test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	20/10/2023	[NT]
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	20/10/2023	[NT]
pH_F (field pH test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
pH_{FOX} (field peroxide test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	20/10/2023	[NT]
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	20/10/2023	[NT]
pH_F (field pH test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
pH_{FOX} (field peroxide test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

COC 13/10/23
@1000

FOUNDATION EARTH SCIENCES

Chain of Custody Record

Client Details:	Foundation Earth Sciences PO Box 4405, East Gosford NSW 2250 email: ben@foundationes.com.au michael@foundationes.com.au; reece@foundationes.com.au ph: +61466 385 221	**Project Manager:**	Michael Silk
		Sampled By:	RW
Delivery Details:	Envirolab Pty Ltd 12 Ashley Street, Chatswood NSW 2067 email: ahle@envirolab.com.au ph: +612 9910 6200	**Purchase Order #:**	N/A
		Page #:	1 of 1

Project #: E3124-2
Project Name: Wyee
Quote #:
Turnaround: Standard

#	Sample ID	Depth	Date Sampled	Matrix	Analytes	Sample Comments
					ASS Field Test phF & phFOX	
1	ASSA1-1	0.0-0.1	12.10.2023		X	Keep
2	ASSA1-2	0.5-0.6	12.10.2023		X	Keep
3	ASSA1-3	1.0-1.1	12.10.2023		X	Keep
4	ASSA1-4	1.5-1.6	12.10.2023		X	Keep
5	ASSA1-5	2.0-2.1	12.10.2023		X	Keep
6	ASSA1-6	2.5-2.6	12.10.2023		X	Keep
7	ASSA1-7	2.9-3.0	12.10.2023		X	Keep
8	ASSA2-1	0.0-0.1	12.10.2023		X	Keep
9	ASSA2-2	0.5-0.6	12.10.2023		X	Keep
10	ASSA2-3	1.0-1.1	12.10.2023		X	Keep
11	ASSA2-4	1.5-1.6	12.10.2023		X	Keep
12	ASSA2-5	2.0-2.1	12.10.2023		X	Keep
13	ASSA2-6	2.5-2.6	12.10.2023		X	Keep
14	ASSA2-7	2.9-3.0	12.10.2023		X	Keep
15	ASSA3-1	0.0-0.1	12.10.2023		X	Keep
16	ASSA3-2	0.5-0.6	12.10.2023		X	Keep
17	ASSA3-3	1.0-1.1	12.10.2023		X	Keep
18	ASSA3-4	1.5-1.6	12.10.2023		X	Keep
19	ASSA3-5	2.0-2.1	12.10.2023		X	Keep
20	ASSA3-6	2.5-2.6	12.10.2023		X	Keep
21	ASSA3-7	2.9-3.0	12.10.2023		X	Keep
22	ASSA4-1	0.0-0.1	12.10.2023		X	Keep
23	ASSA4-2	0.5-0.6	12.10.2023		X	Keep
24	ASSA4-3	1.0-1.1	12.10.2023		X	Keep
25	ASSA4-4	1.5-1.6	12.10.2023		X	Keep
26	ASSA4-5	2.0-2.1	12.10.2023		X	Keep
27	ASSA4-6	2.5-2.6	12.10.2023		X	Keep
28	ASSA4-7	2.9-3.0	12.10.2023		X	Keep
29	ASSA5-1	0.0-0.1	12.10.2023		X	Keep
30	ASSA5-2	0.5-0.6	12.10.2023		X	Keep
31	ASSA5-3	1.0-1.1	12.10.2023		X	Keep
32	ASSA5-4	1.5-1.6	12.10.2023		X	Keep
33	ASSA5-5	2.0-2.1	12.10.2023		X	Keep
34	ASSA5-6	2.5-2.6	12.10.2023		X	Keep
35	ASSA5-7	2.9-3.0	12.10.2023		X	Keep
36	ASSA6-1	0.0-0.1	12.10.2023		X	Keep
37	ASSA6-2	0.5-0.6	12.10.2023		X	Keep
38	ASSA6-3	1.0-1.1	12.10.2023		X	Keep
39	ASSA6-4	1.5-1.6	12.10.2023		X	Keep
40	ASSA6-5	2.0-2.1	12.10.2023		X	Keep
41	ASSA6-6	2.5-2.6	12.10.2023		X	Keep
42	ASSA6-7	2.9-3.0	12.10.2023		X	Keep

Special Directions and Coments:

Relinquished by	RW	Received By	EW
Signature	RW	Signature	
Date	12.10.2023	Date	1730, 12/10/23

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 335237.
Date Received: 12/10/23
Time Received: 1730
Received By: EW
Temp: Cool/Ambient 10 °C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Foundation Earth Sciences Pty Ltd
Attention	Michael Silk

Sample Login Details

Your reference	E3124-2, Wyee
Envirolab Reference	335237
Date Sample Received	12/10/2023
Date Instructions Received	13/10/2023
Date Results Expected to be Reported	20/10/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	42 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	sPOCAS field test
ASSA1-1-0.0-0.1	✓
ASSA1-2-0.5-0.6	✓
ASSA1-3-1.0-1.1	✓
ASSA1-4-1.5-1.6	✓
ASSA1-5-2.0-2.1	✓
ASSA1-6-2.5-2.6	✓
ASSA1-7-2.9-3.0	✓
ASSA2-1-0.0-0.1	✓
ASSA2-2-0.5-0.6	✓
ASSA2-3-1.0-1.1	✓
ASSA2-4-1.5-1.6	✓
ASSA2-5-2.0-2.1	✓
ASSA2-6-2.5-2.6	✓
ASSA2-7-2.9-3.0	✓
ASSA3-1-0.0-0.1	✓
ASSA3-2-0.5-0.6	✓
ASSA3-3-1.0-1.1	✓
ASSA3-4-1.5-1.6	✓
ASSA3-5-2.0-2.1	✓
ASSA3-6-2.5-2.6	✓
ASSA3-7-2.9-3.0	✓
ASSA4-1-0.0-0.1	✓
ASSA4-2-0.5-0.6	✓
ASSA4-3-1.0-1.1	✓
ASSA4-4-1.5-1.6	✓
ASSA4-5-2.0-2.1	✓
ASSA4-6-2.5-2.6	✓
ASSA4-7-2.9-3.0	✓
ASSA5-1-0.0-0.1	✓
ASSA5-2-0.5-0.6	✓
ASSA5-3-1.0-1.1	✓
ASSA5-4-1.5-1.6	✓

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ABN 37 112 535 645
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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	sPOCAS field test
ASSA5-5-2.0-2.1	✓
ASSA5-6-2.5-2.6	✓
ASSA5-7-2.9-3.0	✓
ASSA6-1-0.0-0.1	✓
ASSA6-2-0.5-0.6	✓
ASSA6-3-1.0-1.1	✓
ASSA6-4-1.5-1.6	✓
ASSA6-5-2.0-2.1	✓
ASSA6-6-2.5-2.6	✓
ASSA6-7-2.9-3.0	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 335237-A

Client Details

Client	Foundation Earth Sciences Pty Ltd
Attention	Reece Wallace
Address	PO Box 4405, East Gosford, NSW, 2250

Sample Details

Your Reference	**E3124-2, Wyee**
Number of Samples	Additional analysis 4 samples
Date samples received	12/10/2023
Date completed instructions received	23/10/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	30/10/2023
Date of Issue	30/10/2023

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

sPOCAS + %S w/w					
Our Reference		335237-A-14	335237-A-16	335237-A-32	335237-A-36
Your Reference	UNITS	ASSA2-7	ASSA3-2	ASSA5-4	ASSA6-1
Depth		2.9-3.0	0.5-0.6	1.5-1.6	0.0-0.1
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	30/10/2023	30/10/2023	30/10/2023	30/10/2023
Date analysed	-	30/10/2023	30/10/2023	30/10/2023	30/10/2023
pH $_{kcl}$	pH units	4.1	5.2	4.1	4.2
TAA pH 6.5	moles H^+ /t	54	7	55	55
s-TAA pH 6.5	%w/w S	0.09	0.01	0.09	0.09
pH $_{Ox}$	pH units	4.0	2.8	3.9	2.5
TPA pH 6.5	moles H^+ /t	57	44	63	130
s-TPA pH 6.5	%w/w S	0.09	0.07	0.10	0.20
TSA pH 6.5	moles H^+ /t	<5	37	8	71
s-TSA pH 6.5	%w/w S	<0.01	0.06	0.01	0.11
ANC_E	% $CaCO_3$	[NT]	[NT]	[NT]	[NT]
a-ANC_E	moles H^+ /t	[NT]	[NT]	[NT]	[NT]
s-ANC_E	%w/w S	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.01	<0.005	0.02	0.006
S_P	%w/w	0.02	0.02	0.02	0.04
S_{POS}	%w/w	<0.005	0.02	<0.005	0.04
a-S_{POS}	moles H^+ /t	<5	9	<5	23
Ca_{KCl}	%w/w	<0.005	0.03	<0.005	0.04
Ca_P	%w/w	<0.005	0.04	<0.005	0.04
Ca_A	%w/w	<0.005	0.005	<0.005	<0.005
Mg_{KCl}	%w/w	0.015	0.006	0.016	0.007
Mg_P	%w/w	0.016	0.006	0.016	0.007
Mg_A	%w/w	<0.005	<0.005	<0.005	<0.005
S_{HCl}	%w/w S	0.011	[NT]	0.022	0.011
S_{NAS}	%w/w S	<0.005	[NT]	<0.005	0.010
a-S_{NAS}	moles H^+ /t	<5	[NT]	<5	<5
s-S_{NAS}	%w/w S	<0.01	[NT]	<0.01	<0.01
Fineness Factor	-	1.5	1.5	1.5	1.5
a-Net Acidity	moles H^+ /t	57	16	56	82
s-Net Acidity	%w/w S	0.09	0.03	0.09	0.13
Liming rate	kg $CaCO_3$ /t	4.3	1.2	4.2	6.2
s-Net Acidity without -ANCE	%w/w S	0.09	0.03	0.09	0.13
a-Net Acidity without ANCE	moles H^+ /t	57	16	56	82
Liming rate without ANCE	kg $CaCO_3$ /t	4.3	1.2	4.2	6.2

SCr					
Our Reference		335237-A-14	335237-A-16	335237-A-32	335237-A-36
Your Reference	UNITS	ASSA2-7	ASSA3-2	ASSA5-4	ASSA6-1
Depth		2.9-3.0	0.5-0.6	1.5-1.6	0.0-0.1
Date Sampled		12.10.2023	12.10.2023	12.10.2023	12.10.2023
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	30/10/2023	30/10/2023	30/10/2023	30/10/2023
Date analysed	-	30/10/2023	30/10/2023	30/10/2023	30/10/2023
Chromium Reducible Sulfur	%w/w	<0.005	<0.005	<0.005	0.005
a-Chromium Reducible Sulfur	moles H^+ /t	<3	<3	<3	3

Method ID	Methodology Summary
Inorg-064	sPOCAS determined using titrimetric and ICP-AES techniques. Ideally samples should be received in the laboratory at <6oC. Please refer to SRA for sample temperature on receipt. Net acidity including ANC has a safety factor of 1.5 applied. Neutralising value (NV) of 100% is assumed for liming rate The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL result. However, it has been applied in the SNAS calculation: SNAS % = (SHCL-SKCL)x2
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Net acidity including ANC has a safety factor of 1.5 applied. Neutralising value (NV) of 100% is assumed for liming rate. The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL result. However, it has been applied in the SNAS calculation: SNAS % = (SHCL-SKCL)x2

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/10/2023	14	30/10/2023	30/10/2023		30/10/2023	[NT]
Date analysed	-			30/10/2023	14	30/10/2023	30/10/2023		30/10/2023	[NT]
pH $_{kcl}$	pH units		Inorg-064	[NT]	14	4.1	4.1	0	100	[NT]
TAA pH 6.5	moles H^+/t	5	Inorg-064	<5	14	54	54	0	100	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	14	0.09	0.09	0	[NT]	[NT]
pH $_{Ox}$	pH units		Inorg-064	[NT]	14	4.0	4.0	0	93	[NT]
TPA pH 6.5	moles H^+/t	5	Inorg-064	<5	14	57	57	0	71	[NT]
s-TPA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	14	0.09	0.09	0	[NT]	[NT]
TSA pH 6.5	moles H^+/t	5	Inorg-064	<5	14	<5	<5	0	[NT]	[NT]
s-TSA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	14	<0.01	<0.01	0	[NT]	[NT]
ANC_E	% $CaCO_3$	0.05	Inorg-064	<0.05	14	[NT]	[NT]		[NT]	[NT]
a-ANC_E	moles H^+/t	5	Inorg-064	<5	14	[NT]	[NT]		[NT]	[NT]
s-ANC_E	%w/w S	0.05	Inorg-064	<0.05	14	[NT]	[NT]		[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-064	<0.005	14	0.01	0.01	0	[NT]	[NT]
S_P	%w/w	0.005	Inorg-064	<0.005	14	0.02	0.02	0	[NT]	[NT]
S_{POS}	%w/w	0.005	Inorg-064	<0.005	14	<0.005	<0.005	0	[NT]	[NT]
a-S_{POS}	moles H^+/t	5	Inorg-064	<5	14	<5	<5	0	[NT]	[NT]
Ca_{KCl}	%w/w	0.005	Inorg-064	<0.005	14	<0.005	<0.005	0	[NT]	[NT]
Ca_P	%w/w	0.005	Inorg-064	<0.005	14	<0.005	<0.005	0	[NT]	[NT]
Ca_A	%w/w	0.005	Inorg-064	<0.005	14	<0.005	<0.005	0	[NT]	[NT]
Mg_{KCl}	%w/w	0.005	Inorg-064	<0.005	14	0.015	0.015	0	[NT]	[NT]
Mg_P	%w/w	0.005	Inorg-064	<0.005	14	0.016	0.015	6	[NT]	[NT]
Mg_A	%w/w	0.005	Inorg-064	<0.005	14	<0.005	<0.005	0	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-064	<0.005	14	0.011	0.011	0	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-064	<0.005	14	<0.005	<0.005	0	[NT]	[NT]
a-S_{NAS}	moles H^+/t	5	Inorg-064	<5	14	<5	<5	0	[NT]	[NT]
s-S_{NAS}	%w/w S	0.01	Inorg-064	<0.01	14	<0.01	<0.01	0	[NT]	[NT]
Fineness Factor	-	1.5	Inorg-064	<1.5	14	1.5	1.5	0	[NT]	[NT]
a-Net Acidity	moles H^+/t	5	Inorg-064	<5	14	57	56	2	[NT]	[NT]
s-Net Acidity	%w/w S	0.01	Inorg-064	<0.01	14	0.09	0.09	0	[NT]	[NT]
Liming rate	kg $CaCO_3$/t	0.75	Inorg-064	<0.75	14	4.3	4.2	2	[NT]	[NT]
s-Net Acidity without -ANCE	%w/w S	0.01	Inorg-064	<0.01	14	0.09	0.09	0	[NT]	[NT]

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-064	<5	14	57	56	2	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-064	<0.75	14	4.3	4.2	2	[NT]	[NT]

QUALITY CONTROL: SCr						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/10/2023	14	30/10/2023	30/10/2023		30/10/2023	[NT]
Date analysed	-			30/10/2023	14	30/10/2023	30/10/2023		30/10/2023	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	14	<0.005	<0.005	0	97	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	14	<3	<3	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

FOUNDATION EARTH SCIENCES

Chain of Custody Record

Client Details:	Foundation Earth Sciences PO Box 4405, East Gosford NSW 2250 email: ben@foundationes.com.au michael@foundationes.com.au; reece@foundationes.com.au ph: +61466 385 221	**Project Manager:**	Michael Silk	**Project #:E3124-2**
		Sampled By:	RW	**Project Name: Wyee**
Delivery Details:	Envirolab Pty Ltd 12 Ashley Street, Chatswood NSW 2067 email: ahle@envirolab.com.au ph: +612 9910 6200	**Purchase Order #:**	N/A	**Quote #:**
		Page #:	1 of 1	**Turnaround: Standard**

#	Sample ID	Depth	Date Sampled	Matrix	Analytes																Sample Comments
								ASS Field Test phF & phFOX					SPOCAS				Chromium Reducible				
1	ASSA2-7	2.9-3.0											x				x				Keep
2	ASSA3-2	0.4-0.5											x				x				Keep
3	ASSA5-4	1.4-1.5											x				x				Keep
4	ASSA6-1	0.0-0.1											x				x				Keep
																					Keep
																					Keep

14
16
32
36

Special Directions and Coments: Please refer to AA374616

Relinquished by	RW	Received By	ABV, ELS SYD
Signature		Signature	
Date	23.10.2023	Date	23/10/23 1745

335237 - A

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Foundation Earth Sciences Pty Ltd
Attention	Reece Wallace

Sample Login Details

Your reference	E3124-2, Wyee
Envirolab Reference	335237-A
Date Sample Received	12/10/2023
Date Instructions Received	23/10/2023
Date Results Expected to be Reported	30/10/2023

Sample Condition

Samples received in appropriate condition for analysis	Holding time exceedance
No. of Samples Provided	Additional analysis 4 samples
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoiced accordingly.

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	sPOCAS + %S w/w	SCr	On Hold
ASSA1-1-0.0-0.1			✓
ASSA1-2-0.5-0.6			✓
ASSA1-3-1.0-1.1			✓
ASSA1-4-1.5-1.6			✓
ASSA1-5-2.0-2.1			✓
ASSA1-6-2.5-2.6			✓
ASSA1-7-2.9-3.0			✓
ASSA2-1-0.0-0.1			✓
ASSA2-2-0.5-0.6			✓
ASSA2-3-1.0-1.1			✓
ASSA2-4-1.5-1.6			✓
ASSA2-5-2.0-2.1			✓
ASSA2-6-2.5-2.6			✓
ASSA2-7-2.9-3.0	✓	✓	
ASSA3-1-0.0-0.1			✓
ASSA3-2-0.5-0.6	✓	✓	
ASSA3-3-1.0-1.1			✓
ASSA3-4-1.5-1.6			✓
ASSA3-5-2.0-2.1			✓
ASSA3-6-2.5-2.6			✓
ASSA3-7-2.9-3.0			✓
ASSA4-1-0.0-0.1			✓
ASSA4-2-0.5-0.6			✓
ASSA4-3-1.0-1.1			✓
ASSA4-4-1.5-1.6			✓
ASSA4-5-2.0-2.1			✓
ASSA4-6-2.5-2.6			✓
ASSA4-7-2.9-3.0			✓
ASSA5-1-0.0-0.1			✓
ASSA5-2-0.5-0.6			✓
ASSA5-3-1.0-1.1			✓
ASSA5-4-1.5-1.6	✓	✓	

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Sample ID	sPOCAS + %S w/w	SCr	On Hold
ASSA5-5-2.0-2.1			✓
ASSA5-6-2.5-2.6			✓
ASSA5-7-2.9-3.0			✓
ASSA6-1-0.0-0.1	✓	✓	
ASSA6-2-0.5-0.6			✓
ASSA6-3-1.0-1.1			✓
ASSA6-4-1.5-1.6			✓
ASSA6-5-2.0-2.1			✓
ASSA6-6-2.5-2.6			✓
ASSA6-7-2.9-3.0			✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.