

National Storage

Acid Sulfate Soils Assessment:
11 and 11A Edinburgh Road,
Marrickville, NSW



ENVIRONMENTAL



WATER



WASTEWATER



GEOTECHNICAL



CIVIL



PROJECT
MANAGEMENT



P2108688JR02V01
June 2022

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All enquiries regarding this project are to be directed to the Project Manager.

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General Abbreviations

AASS	Actual acid sulfate soil
ABC	Ambient background concentrations
ACM	Asbestos containing material
AEC	Area of environmental concern
AF	Asbestos fines
AMP	Asbestos Management Plan
ANZECC	Australia and New Zealand Environment Conservation Council
ANZG	Australian and New Zealand Governments
ASC NEPM	National Environmental Protection (Assessment of Site Contamination) Measure (2013)
ASS	Acid sulfate soil
ASSMAC	Acid Sulfate Soils Management Advisory Committee
AST	Above ground storage tank
BGL	Below ground level
BH	Borehole
BTEXN	Benzene, toluene, ethylbenzene, xylene, naphthalene
CEMP	Construction Environmental Management Plan
COC	Chain of custody
COPC	Contaminants of potential concern
DA	Development application
DBT	Dibutyltin
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DNAPL	Dense non aqueous phase liquid
DP	Deposited Plan
DPI	NSW Department of Primary Industry
DPIW	NSW Department of Primary Industry – Water
DQI	Data quality indicators
DQO	Data quality objectives
DSI	Detailed Site Investigation
EAC	Ecological assessment criteria
EIL	Ecological investigation level
EMP	Environmental Management Plan
EPA	NSW Environmental Protection Authority
EQL	Estimated quantitation limit (interchangeable with PQL and LOR)
ESA	Environmental Site Assessment
ESL	Ecological screening level
FA	Fibrous asbestos
GIL	Groundwater investigation level
HIL	Health investigation level
HM	Heavy metals
HSL	Health screening level
IA	Investigation area
ISQG	Interim Sediment Quality Guideline
ITP	Inspection Testing Plan
LGA	Local government area
LNAPL	Light non aqueous phase liquid
LOR	Limit of reporting (interchangeable with EQL and PQL)
MA	Martens & Associates Pty Ltd
mAHD	Metres, Australian Height Datum
mbgl	Metres below ground level

MBT	Monobutyltin
MNA	Monitored natural attenuation
MPE	Multi phase extraction
NAPL	Non aqueous phase liquid
NATA	National Association of Testing Authorities
ND	No data
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OCP	Organochloride pesticides
OEH	NSW Office of Environment and Heritage
OPP	Organophosphorus pesticides
PACM	Potential asbestos containing material
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential acid sulfate soil
PCB	Polychlorinated biphenyl
PCEMP	Post Construction Environmental Management Plan
PESA	Preliminary Environmental Site Assessment
PFAS	Per and polyfluoroalkyl substances
PID	Photoionisation detector
ppb	Parts per billion
ppm	Parts per million
PQL	Practical quantitative limit (interchangeable with EQL and LOR)
PSI	Preliminary Site Investigation
QA/QC	Quality assurance / quality control
RAC	Remediation acceptance criteria
RAP	Remedial Action Plan
HHRA	Human Health Risk Assessment
RPD	Relative percentage difference
SAC	Site assessment criteria
SAQP	Sampling and Analysis Quality Plan
SEPP	State Environmental Planning Policy
SIL	Soil investigation level
SOP	Standard operating procedure
SWL	Standing water level
SWMS	Safe Work Method Statement
TB	Trip blank
TBT	Tributyl tin
TCLP	Toxicity characteristics leaching procedure
TEQ	Toxic equivalency factor
TP	Test pit
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
TS	Trip spike
UCL	Upper confidence limit
UPSS	Underground petroleum storage system
UST	Underground storage tank
VHC	Volatile halogenated compounds
VOC	Volatile organic compounds
WHS	Work health and safety
WHSP	Work Health and Safety Plan

1 Introduction

1.1 Overview

This report, prepared by Martens and Associates (MA), documents an acid sulfate soils (ASS) assessment undertaken on behalf of National Storage (the Client) at 11 and 11A Edinburgh Road, Marrickville, NSW (the site). The assessment was completed as part of a due diligence exercise to support the construction of a multi-level storage facility at the site.

1.2 Proposed Development

From the geotechnical brief (ADG, 2022) and client provided information, we understand that the project comprises the conversion of the existing warehouse to an at – grade multi – level storage facility.

It is understood that the project does not include a basement and will require minimal excavation to achieve design levels. However, excavation will be required for piling (i.e. foundation works likely up to 5.0 – 6.0 metres below ground level (mbgl)) and trenching for underground services up to 1.0 mbgl.

1.3 Scope of Works

The following scope of work was completed as part of this ASS assessment:

- Preliminary assessment of the site (desktop assessment) including review of ASS risk mapping and site specific geomorphic features.
- Field investigation comprising borehole excavation and targeted laboratory testing of soil samples.
- Preparation of a preliminary ASS assessment report in general accordance with ASSMAC (1998) to determine whether an ASS management plan (ASSMP) and / or further investigation works are required.

1.4 Reference Guidelines

This investigation was undertaken in general accordance with the following guidelines:

- Acid Sulfate Soil Management Advisory Committee (1998), *Acid Sulfate Soil Manual*. Referred to as ASSMAC (1998)

- Qld Natural Resources, Mines and Energy (2004) *Acid Sulfate Soils Laboratory Methods Guidelines*.
- Water Quality Australia (2018) *National Acid Sulfate Soils Guidance: National acid sulfate soils sampling and identification methods manual*.

2 Site Background Information

2.1 Site Details

Site information is summarised in Table 1. The site location and general surrounds are shown in Attachment A.

Table 1: Site background information.

Item	Description / Detail
Site address	11 and 11A Edinburgh Road, Marrickville, NSW.
Legal identifier	Lot 67 in DP 4991 Lot 1 in DP 607677
Local government area	Inner West Council (formerly Marrickville Council)
Site area	0.715 ha (SLR, 2018)
Site description	At the time of this assessment, the existing development at the site comprised commercial facilities including a storage warehouse (in Lot 1 DP 607677) and a car servicing centre (in Lot 67 in DP4991) with concrete hardstand in external areas. An asphalt car park was present on the north western portion of Lot 1 DP 607677.
Topography	The site slopes gently towards the south west with grades of <5%. Site elevation ranges between 4.3 mAHD in the south west, and 5.8 mAHD in the north east. Site contours are shown on Map 02 in Attachment A.
Surface hydrology	Drainage of the site is via overland flow towards to the south.
Vegetation	Existing site vegetation comprises scattered small garden beds containing grass, shrubbery and mature trees.
Expected geology	The <i>Sydney 1:100 000 Geological Sheet 9130</i> indicates the site to be underlain by Ashfield Shale (Rwa) comprising black to dark grey shale and laminite. (Herbert C., 1983).
Expected soil landscape	The NSW Office of Environment and Heritage's (OEH) information system (eSPADE) indicates the site to be located in the Blacktown (bt) soil landscape, with deep (> 200 cm) total soil depths. A brownish black loam topsoil and deep clayey subsoil is expected to be present at the site. This soil landscape is often associated with moderate erodibility, high shrink – swell (localized) and potential localized salinity hazards.

3 Preliminary Assessment

3.1 ASS Soil Risk Map Classification

The Marrickville Local Environmental Plan (2011) ASS risk map indicates that the entire site is located within a Class 2 risk area for ASS. Class 2 risk designates that any works undertaken below the natural ground surface, or by which the water table is likely to be lowered, will require an ASSMP or a preliminary assessment as per ASSMAC (1998) prior to development consent.

Site location relating to ASS risk is presented on Map 03 in Attachment A.

3.2 Geomorphic Setting

The likelihood of ASS presence at a site is a function of various geomorphic parameters, in particular those listed in ASSMAC (1998).

Geomorphic parameters for the site which may indicate ASS presence are listed in Table 2.

Table 2: Geomorphic features indicative of ASS.

Geomorphic Feature	Present on Site?
Holocene sediments	Possible
Soil horizons less than 5 m AHD	Yes
Marine / estuarine sediments or tidal lakes	Yes
Coastal wetland; backwater swamps; waterlogged or scaled areas; inter-dune swales or coastal sand dunes (i.e. deep excavation is required)	No
Dominant vegetation is mangroves, reeds, rushes and other swamp or marine tolerant species.	No
Geologies containing sulfide bearing material / coal deposits or former marine shales / sediments	Possible
Deep older (Holocene or Pleistocene) estuarine sediments > 10 mBGL (if deep excavation or drainage is proposed)	Possible

The geomorphic setting of the site indicates that there is a high likelihood of ASS presence, as five of the seven listed geomorphic features are possible or known to be present at the site.

4 Field Investigations

4.1 Fieldwork Overview

Field ASS investigations were completed on 24 March 2022 concurrently with a geotechnical investigation (MA, 2022), and involved the following works:

- Excavation of four boreholes (BH101 – BH104) using a hand auger / push tube to a maximum depth of 2.0 mbgl.
- Excavation of three boreholes (BH105 – BH107) using a truck mounted drill rig fitted with solid flight augers, to a maximum depth of 7.5 mbgl.
- Collection of representative soil samples from all boreholes for laboratory ASS analysis and future reference purposes.

Testing locations are shown on Map 04 in Attachment A.

4.2 Subsurface conditions

Field investigations observed that the site was underlain by the following generalised subsurface units:

Unit A: Fill – silty clay / silty sand, with gravels, up to 1.3 mbgl (BH107). For the purposes of this report, fill is considered to have been placed under uncontrolled conditions due to the absence of earthworks quality control certification.

Unit B: Residual soil – silty clay, consistencies ranging between firm to hard, with iron indurated bands, trace shale gravels, up to 7.0 mbgl (BH105).

Unit C: Shale – inferred highly weathered, very low to low strength, present below Unit B, up to 7.5 mbgl (BH105). The top of rock is inferred to rise northwards.

Detailed borehole logs are provided in Attachment B.

5 Laboratory Analysis

5.1 Action Criteria

Soil samples were selected for analysis using the chromium reducible sulfur (S_{CR}) method, and assessed against the following action criteria adopted from Table 4.4 of ASSMAC (1998) based on a fine soil type (medium to heavy clays):

- Oxidisable sulphur: S_{CR} is $\geq 0.1\%$; or
- Net acidity is ≥ 62 mol H^+ /tonne.

MA understands that the proposed development is not to include a basement, and will not require any significant excavation to achieve design levels. Therefore, this assessment assumes that future works at the site will involve the disturbance of less than 1,000 tonnes of soil material.

5.2 Soil Analytical Results

A total of 14 soil samples taken from BH101 – BH107 were submitted to a NATA accredited laboratory (Envirolab Pty Ltd) for S_{CR} analysis. Samples were taken from fill and natural layers at various depths across the site.

S_{CR} results are summarised in Table 4 below. Bolded values indicate exceedances of ASSMAC (1998) action criteria. Detailed tabulated results are provided in Attachment C.

Table 3: Laboratory S_{CR} result summary.

ID	Sample Depth (mbgl)	pH _{kcl}	Sulfur Trail (S_{CR}) (%S)	Net Acidity (acidity units, mol H^+ /t)
BH101	1.4 - 1.6	3.9	0.007	84
BH102	1.3 - 1.5	4.4	0.006	46
BH103	1.5 - 1.7	4	0.006	63
	1.8 - 2.0	4	<0.005	89
BH104	1.0 - 1.2	6.9	<0.005	<5
BH105	0.15 - 0.25	5.6	0.02	15
	2.5 - 3.0	4	0.007	100
	4.8 - 5.1	4	<0.005	51
BH106	1.7 - 2.0	3.8	<0.005	89
	3.0 - 3.2	3.8	<0.005	50
	5.1 - 5.3	3.9	<0.005	52

ID	Sample Depth (mbgl)	pH _{kcl}	Sulfur Trail (S _{CR}) (%S)	Net Acidity (acidity units, mol H ⁺ /t)
BH107	0.3 - 0.4	9.9	<0.005	<5
	2.5 - 2.9	3.8	<0.005	49
	4.7 - 5.0	4.2	<0.005	32

5.3 Interpretation of Results

Laboratory results show that analysed samples contain low amounts of sulfur with the highest sample (BH105/0.15-0.25 collected from shallow fill material) having 0.02 %S which is below the ASSMAC (1998) action criteria for sulfur trail. All other samples reported results below the laboratory detection limit and well below sulfur trail action criteria.

These results indicate that site soils do not meet the ASSMAC (1998) definition of actual ASS (AASS) or potential ASS (PASS) due to the soils containing low levels or no detection of sulfides. Therefore, the preparation of an ASS management plan (ASSMP) is not required.

The measured pH values and net acidity values indicate that site soils are acidic, which should be considered in the design of any future subsurface infrastructure. It is recommended that aggressivity testing (EC, SO₄, Cl and resistivity) of site soils is completed to assess exposure classifications and aid appropriate design of any future buried structures.

6 Conclusion

This ASS assessment was completed as part of a due diligence exercise to support the construction of a multi-level storage facility at 11 and 11A Edinburgh Road, Marrickville, NSW. MA understands that the proposed development is not to include a basement, and will not require any significant excavation to achieve design levels. It was therefore, assumed, as part of this assessment, that future works at the site will involve the disturbance of less than 1,000 tonnes of soil material.

The assessment included subsurface investigation works and laboratory assessment of soil samples collected during investigation works.

The results of this assessment found that site soils do not meet the definition of AASS or PASS and that preparation of an ASSMP is not required.

While the soils were not found to meet the definition of AASS or PASS, the measured pH values and net acidity values indicate that site soils are acidic. These findings should be considered in the design of any future subsurface infrastructure.

It is recommended aggressivity testing (EC, SO₄, Cl and resistivity) of site soils is completed to assess exposure classifications and aid appropriate design of any future buried structures.

7 Limitations

The recommendations presented in this report include specific issues to be addressed during future planning and construction phases of the project.

In the event that any of the recommendations presented in this report are not implemented, the general recommendations may become inapplicable and Martens & Associates Pty Ltd accept no responsibility whatsoever for the performance of the works undertaken where recommendations are not implemented in full and properly tested, inspected and documented.

Occasionally, sub-surface conditions between and below the completed boreholes or other tests may be found to be different (or may be interpreted to be different) from those expected. Variation can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact Martens & Associates Pty Ltd.

8 References

- ADG (2022) *Geotechnical Brief*, referenced project 11-11A Edinburgh Road, Marrickville, NSW. Ref. 25796, dated 18.02.22.
- Acid Sulfate Soil Management Advisory Committee (1998), *Acid Sulfate Soil Manual*. Referred to as ASSMAC (1998).
- Herbert, C. (1983), *Sydney 1:100 000 Geological Sheet 9130, 1st edition*, Geological Survey of New South Wales, Sydney.
- Martens and Associates (2022) *Geotechnical Assessment, 11 and 11A Edinburgh Road, Marrickville, NSW*. Ref. P2108688JR01V01, dated 08/04/2022.
- Qld Natural Resources, Mines and Energy (2004) *Acid Sulfate Soils Laboratory Methods Guidelines*.
- SLR (2018) *Stage 1 Preliminary Site Investigation For Future Mixed Residential/ Commercial Site Re-development Lot 1 in DP607677 and Lot 67 in DP4991 11 & 11A Edinburgh Road, Marrickville NSW*. Ref. 610.18174-R01-v1.0, dated 05.07.2018.
- Water Quality Australia (2018) *National Acid Sulfate Soils Guidance: National acid sulfate soils sampling and identification methods manual*.

Attachment A: Site Plans



0 10 20 30 40 50 m

1:1250 @ A3

Aerial: Nearmap (2022)

Map Title / Figure:
Site Overview

Map 01
 11 & 11A Edinburgh Road, Marrickville, NSW
 Engineering Services
 Acid Sulfate Soils Assessment
 National Storage C/- LRM Global Pty Ltd
 12/04/2022

Map
 Site
 Project
 Sub-Project
 Client
 Date

Legend

- Contours (mAHD)
- Site Boundary
- Cadastre



0 6 12 18 24 30 m

1:500 @ A3
 Viewport A
 Aerial: Nearmap (2022)
 Contours: NSW Government 1m DEM (2020)

Map Title / Figure:
Contours

Legend

ASS Risk Class

- Class 2
- Class 5
- Site Boundary
- Cadastre






1:500 @ A3
 Viewport A
 Aerial: Nearmap (2022)
 ASS Risk Mapping: NSW DPIE (1995)



Map Title / Figure:
ASS Risk Map

Legend

-  Borehole Locations
-  Site Boundary
-  Cadastre



0 6 12 18 24 30 m

1:500 @ A3
 Viewport A
 Aerial: Nearmap (2022)


Map Title / Figure:
Testing Plan

Attachment B: Borehole Logs

CLIENT	National Storage	COMMENCED	24/03/2022	COMPLETED	24/03/2022	REF BH101	
PROJECT	Geotechnical Assessment	LOGGED	MZ	CHECKED	SK	Sheet 1 OF 1	
SITE	11 & 11A Edinburgh Road, Marrickville, NSW	GEOLOGY	Ashfield Shale	VEGETATION	Nil	PROJECT NO. P2108688	
EQUIPMENT	Push tube / Hand auger	LONGITUDE	151.172687	RL SURFACE	6.6 m	DATUM	AHD
EXCAVATION DIMENSIONS	2.00 m depth	LATITUDE	-33.908321	ASPECT	South	SLOPE	<2%

		Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT				0.15					CONCRETE				PAVEMENT
				6.45	0.15-0.35/S/1 D 0.15-0.35 m			CI-CH	FILL; Silty CLAY; medium plasticity; brown, grey; with gravels; inferred well compacted.				FILL
					0.5-0.7/S/1 D 0.50-0.70 m								
PT		Not Encountered		0.90				CI-CH	CLAY; medium to high plasticity; red, pale grey; with iron indurated bands; trace gravels.	M (>PL)			RESIDUAL SOIL
				5.70	1.1-1.2/S/1 D 1.10-1.20 m								
					1.4-1.6/S/1 D 1.40-1.60 m						St - VSI		
HA					1.8-2.0/S/1 D 1.80-2.00 m								
				2.00					Hole Terminated at 2.00 m (Target depth reached)				

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

 <p>MARTENS & ASSOCIATES PTY LTD Suite 201, 20 George St. Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 mail@martens.com.au WEB: http://www.martens.com.au</p>	<p>Engineering Log - BOREHOLE</p>
--	--

MARTENS 2.00.LIB.GLB Log MARTENS BOREHOLE P2108688BH101-BH107V01.GPJ <DrawingFile> 21/04/2022 16:18 10.02.00.04 D:\git\Lab and in Situ Tool - DGD | Lib: Martens 2.00 2016-11-13 Proj: Martens 2.00 2016-11-13

CLIENT	National Storage	COMMENCED	24/03/2022	COMPLETED	24/03/2022	REF BH102 Sheet 1 OF 1 PROJECT NO. P2108688	
PROJECT	Geotechnical Assessment	LOGGED	MZ	CHECKED	SK		
SITE	11 & 11A Edinburgh Road, Marrickville, NSW	GEOLOGY	Ashfield Shale	VEGETATION	Nil		
EQUIPMENT	Push tube / Hand auger	LONGITUDE	151.173163	RL SURFACE	7.8 m	DATUM	AHD
EXCAVATION DIMENSIONS	1.50 m depth	LATITUDE	-33.907887	ASPECT	South	SLOPE	<2%

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0.15						CONCRETE				PAVEMENT
PT	Not Encountered		7.65		0.2-0.35/S/1 D 0.20-0.35 m			CI-CH	FILL; Silty CLAY; medium plasticity; brown, grey; with gravels; inferred well compacted.				FILL
			1.00		0.5-0.7/S/1 D 0.50-0.70 m					M (>PL)			
HA			6.80		1.0-1.2/S/1 D 1.00-1.20 m			CI-CH	CLAY; medium to high plasticity; brown, pale grey; trace gravels.				RESIDUAL SOIL
			6.55		1.3-1.5/S/1 D 1.30-1.50 m			CI-CH	CLAY; medium to high plasticity; red, pale grey; with iron indurated bands; trace gravels.		VSt-H		
			1.50						Hole Terminated at 1.50 m (Target depth reached)				
			2										
			3										
			4										
			5										
			6										
			7										

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

MARTENS 2.00 LIB.GLB Log MARTENS BOREHOLE P2108688BH101-BH107V01.GPJ <DrawingFile> 21/04/2022 16:18 10.02.00.04 D:\git\Lab and In Situ Tool - DGD | Lib: Martens 2.00 2016-11-13 Proj: Martens 2.00 2016-11-13



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**Engineering Log -
BOREHOLE**

CLIENT	National Storage	COMMENCED	24/03/2022	COMPLETED	24/03/2022	REF BH104 Sheet 1 OF 1 PROJECT NO. P2108688	
PROJECT	Geotechnical Assessment	LOGGED	MZ	CHECKED	SK		
SITE	11 & 11A Edinburgh Road, Marrickville, NSW	GEOLOGY	Ashfield Shale	VEGETATION	Nil		
EQUIPMENT	Push tube / Hand auger	LONGITUDE	151.172574	RL SURFACE	7.7 m	DATUM	AHD
EXCAVATION DIMENSIONS	1.45 m depth	LATITUDE	-33.9079	ASPECT	South	SLOPE	<2%

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT				0.15					CONCRETE				PAVEMENT
				7.55	0.15-0.3/S/1 D 0.15-0.30 m	█	█	CI-CH	FILL; Silty CLAY; medium plasticity; brown, grey; with gravels; inferred well compacted.				FILL
PT				0.85	0.5-0.7/S/1 D 0.50-0.70 m	█	█		Light brown.		M (>PL)		
				1.00	1.0-1.2/S/1 D 1.00-1.20 m	█	█	CI-CH	CLAY; medium to high plasticity; red, pale grey; with iron indurated bands; trace gravels.				RESIDUAL SOIL
HA		inflow		6.70	1.3-1.45/S/1 D 1.30-1.45 m	█	█				VSt-H		
				1.45					Hole Terminated at 1.45 m (Target depth reached)				
				2									
				3									
				4									
				5									
				6									
				7									

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

MARTENS 2.00 LIB.GLB Log MARTENS BOREHOLE P2108688BH101-BH107V01.GPJ <DrawingFile> 21/04/2022 16:18 10.02.00.04 D:\git\Lab and In Situ Tool - DGD | Lib: Martens 2.00 2016-11-13 Pjf: Martens 2.00 2016-11-13



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**Engineering Log -
BOREHOLE**

CLIENT	National Storage	COMMENCED	24/03/2022	COMPLETED	24/03/2022	REF BH105	
PROJECT	Geotechnical Assessment	LOGGED	MH	CHECKED	SK	Sheet 1 OF 1	
SITE	11 & 11A Edinburgh Road, Marrickville, NSW	GEOLOGY	Ashfield Shale	VEGETATION	Nil	PROJECT NO. P2108688	
EQUIPMENT	4WD ute-mounted hydraulic drill rig	LONGITUDE	151.173313	RL SURFACE	6.3 m	DATUM	AHD
EXCAVATION DIMENSIONS	Ø100 mm x 7.50 m depth	LATITUDE	-33.908395	ASPECT	South	SLOPE	<5%

Drilling			Sampling			Field Material Description									
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
AD/V	L	Not Encountered	0.10	6.20	0.11-0.25/S/1 D 0.11-0.25 m	█	█	CH	CONCRETE FILL: Silty CLAY; medium plasticity; brown, black; trace gravels; inferred well compacted.	M (>PL)			PAVEMENT FILL		
			1.00	5.30	0.5-0.7/S/1 D 0.50-0.70 m 0.6-0.7/S/1 D 0.60-0.70 m 0.8-1.0/S/1 D 0.80-1.00 m 1.0-1.4/S/1 D 1.00-1.40 m SPT 1.05 m 2.2.4 N=6 1.2-1.3/S/1 1.20-1.30 m	█	█	CH	Silty CLAY; high plasticity; reddish brown.	F			RESIDUAL SOIL		
			2.10	4.20	1.8-2.0/S/1 D 1.80-2.00 m	█	█		Becoming grey and reddish brown.	St-Vst					
			2.50	3.80	SPT 2.50 m 5.10,10 N=20 2.5-3.0/S/1 D 2.50-3.00 m	█	█		Silty CLAY; medium to high plasticity; grey, yellow and reddish brown.	CI-CH					
			4.00	2.30	SPT 4.00 m 5.9,12 N=21 4.00-4.4/S/1 D 4.00-4.40 m 4.4-4.6/S/1 D 4.40-4.60 m	█	█		Silty CLAY; medium to high plasticity; grey, yellow and brown.	CI-CH					
			5		4.8-5.1/S/1 D 4.80-5.10 m	█	█								
			6		SPT 5.50 m 6,10,11 N=21 5.5-5.9/S/1 D 5.50-5.90 m	█	█								
AD/T	M	H	6.40	-0.10	6.3-6.5/S/1 D 6.30-6.50 m	█	█		SHALE; highly weathered; dark grey, dark brown, brown; inferred very low to low strength.				WEATHERED ROCK 6.40: V-bit refusal at 6.4m on inferred low strength shale.		
			7.00	-0.70						SHALE; highly weathered; brown, dark brown; inferred low strength.					
			7.50						Hole Terminated at 7.50 m (Target depth reached)						

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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**Engineering Log -
BOREHOLE**

CLIENT	National Storage	COMMENCED	24/03/2022	COMPLETED	24/03/2022	REF BH106	
PROJECT	Geotechnical Assessment	LOGGED	MH	CHECKED	SK	Sheet 1 OF 1	
SITE	11 & 11A Edinburgh Road, Marrickville, NSW	GEOLOGY	Ashfield Shale	VEGETATION	Nil	PROJECT NO. P2108688	
EQUIPMENT	4WD ute-mounted hydraulic drill rig	LONGITUDE	151.173503	RL SURFACE	7.1 m	DATUM	AHD
EXCAVATION DIMENSIONS	Ø100 mm x 6.40 m depth	LATITUDE	-33.908151	ASPECT	South	SLOPE	<5%

Drilling			Sampling			Field Material Description									
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
ADV	L	Not Encountered	0.13	6.97	0.2-0.3/S/1 D 0.20-0.30 m 0.3-0.6/S/1 D 0.30-0.60 m	█	█	CH	CONCRETE				PAVEMENT		
			0.70	6.40	0.7-0.9/S/1 D 0.70-0.90 m	█	█	CH	FILL: Silty CLAY; medium plasticity; brown, dark brown and black; inferred well compacted.				FILL		
			1.10	6.20	SPT 1.00 m 2,4,6 N=10	█	█	CH	Silty CLAY; high plasticity; grey and pale brown; iron indurated bands.				RESIDUAL SOIL		
			1.10	5.90	1.0-1.1/S/1 D 1.00-1.10 m 1.0-1.4/S/1 D 1.00-1.40 m 1.1-1.3/S/1 D 1.10-1.30 m 1.3-1.5/S/1 D 1.30-1.50 m 1.7-2.0/S/1 D 1.70-2.00 m	█	█								
			3.00		SPT 2.50 m 3,6,7 N=13 2.5-3.0/S/1 D 2.50-3.00 m 3.0-3.2/S/1 D 3.00-3.20 m	█	█								
			4.30	2.80	SPT 4.00 m 9,12,17 N=29 4.0-4.4/S/1 D 4.00-4.40 m 4.5-4.7/S/1 D 4.50-4.70 m	█	█				Iron indurated bands.				
			5.10	2.00	5.1-5.3/S/1 D 5.10-5.30 m 5.3-5.5/S/1 D 5.30-5.50 m SPT 5.50 m 9,13,18 N=31 5.5-5.9/S/1 D 5.50-5.90 m	█	█				Iron indurated bands.				
			6.00	1.10	6.0-6.3/S/1 D 6.00-6.30 m	█	█				SHALE; highly weathered; grey and dark grey; inferred very low strength.				WEATHERED ROCK
			6.40			█	█				Hole Terminated at 6.40 m				6.40: V-bit refusal.

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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**Engineering Log -
BOREHOLE**

CLIENT	National Storage	COMMENCED	24/03/2022	COMPLETED	24/03/2022	REF BH107	
PROJECT	Geotechnical Assessment	LOGGED	MH	CHECKED	SK	Sheet 1 OF 1	
SITE	11 & 11A Edinburgh Road, Marrickville, NSW	GEOLOGY	Ashfield Shale	VEGETATION	Nil	PROJECT NO. P2108688	
EQUIPMENT	4WD ute-mounted hydraulic drill rig	LONGITUDE	151.173612	RL SURFACE	8 m	DATUM	AHD
EXCAVATION DIMENSIONS	ø100 mm x 6.50 m depth	LATITUDE	-33.907913	ASPECT	South	SLOPE	<2%

Drilling			Sampling			Field Material Description									
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS / ASCS CLASSIFICATION	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
ADV	L		0.15	7.85	0.15-0.25/S/1 D 0.15-0.25 m 0.3-0.4/S/1 D 0.30-0.40 m	█	█	SM	CONCRETE FILL: Silty SAND; fine to medium grained; grey, dark grey; trace gravels.	M			PAVEMENT FILL		
			0.80	7.20	0.8-0.9/S/1 D 0.80-0.90 m SPT 1.00 m 3,1,3 N=4	█	█	SC	FILL: Silty Sandy CLAY; high plasticity; brown, dark grey.						
			1.30	6.60	1.0-1.4/S/1 D 1.00-1.40 m	█	█	CH	Silty CLAY; high plasticity; grey, reddish brown; with iron indurated bands.					RESIDUAL SOIL	
			6.70	6.60	1.5-1.6/S/1 D 1.50-1.60 m	█	█		Iron indurated bands.					F	
			3.00	5.00	SPT 2.50 m 7.8,12 N=20 2.5-2.9/S/1 D 2.50-2.90 m	█	█		Reddish brown and grey.					M (<PL)	
			4.30	3.70	3.5-3.9/S/1 D 3.50-3.90 m SPT 4.00 m 6,8,14 N=22 4.0-4.4/S/1 D 4.00-4.40 m	█	█		Iron indurated bands.						St and VSt
			5.00	3.00	4.7-5.0/S/1 D 4.70-5.00 m 5.1-5.3/S/1 D 5.10-5.30 m SPT 5.50 m 8,Double Bounce SPT Refusal. 5.5-5.9/S/1 D 5.50-5.90 m	█	█		SHALE; highly weathered; dark grey, dark brown; inferred very low strength.						WEATHERED ROCK
			6.00	2.00	6.1-6.3/S/1 D 6.10-6.30 m	█	█		SHALE; highly weathered; brown, dark grey and grey; inferred very low to low strength.						6.00: V-bit refusal at 6.0m.
			6.50								Hole Terminated at 6.50 m				6.50: TC-bit refusal on inferred very low to low strength shale.
			ADT	M-H	Inflow										

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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**Engineering Log -
BOREHOLE**

Attachment C: Laboratory Summary Table

ASS Laboratory Test Results Interpretation

Method based on Acid Sulfate Soil Manual (ASSMAC, 1998)
Method ST-50 V05 Revised 30.04.2018



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PROJECT DETAILS

Client: National Storage
Project: Acid Sulfate Soil Assessment
Sampling Site: 11 and 11A Edinburgh Road, Marrickville, NSW
Sample Date: 30/03/2022

Page: 1 of 1
Assessment Date: 12/04/2022
Job Number: P2208688
Sampled By: DS

SAMPLE DETAILS / TEST RESULTS

Sample Location	Sample Depth (mbgl)	Inferred Texture	pH Measurements	Sulfur Trail		Acid Trail		ASS - Acid Base Accounting				Liming Rate
			pH _{ket}	Chromium Reducible Sulfur	Chromium Reducible Sulfur (acidity units)	Titrateable Actual Acidity	Titrateable Actual Acidity (sulfur units)	Net Acidity (acidity units)	Net Acidity (sulfur units)	Net Acidity excluding ANC (acidity units)	Net Acidity excluding ANC (sulfur units)	
			pH Units	%S	mole H+/t	mole H+/t	%S	mole H+/t	%S	mole H+/t	%S	kg/t
ASSMAC Criteria <1000 t disturbance		Fine	<3.5	0.1	62	62	0.1	62	0.1	62	0.1	
		Medium	<3.5	0.06	36	36	0.06	36	0.06	36	0.06	
		Coarse	<3.5	0.03	18	18	0.03	18	0.03	18	0.03	
BH101	1.4 - 1.6	Fine	3.9	0.007	4	74	0.12	84	0.14	84	0.14	6.3
BH102	1.3 - 1.5	Fine	4.4	0.006	4	40	0.06	46	0.074	46	0.074	3.5
BH103	1.5 - 1.7	Fine	4	0.006	4	56	0.09	63	0.1	63	0.1	4.7
	1.8 - 2.0	Fine	4	<0.005	<3	86	0.14	89	0.14	89	0.14	6.7
BH104	1.0 - 1.2	Fine	6.9	<0.005	<3	<5	<0.01	<5	<0.005	<5	<0.005	<0.75
BH105	0.15 - 0.25	Fine	5.6	0.02	11	<5	<0.01	15	0.025	15	0.025	1.2
	2.5 - 3.0	Fine	4	0.007	5	75	0.12	100	0.06	100	0.16	7.6
	4.8 - 5.1	Fine	4	<0.005	<3	49	0.08	51	0.081	51	0.081	3.8
BH106	1.7 - 2.0	Fine	3.8	<0.005	<3	86	0.14	89	0.14	89	0.14	6.7
	3.0 - 3.2	Fine	3.8	<0.005	<3	49	0.08	50	0.08	50	0.08	3.8
	5.1 - 5.3	Fine	3.9	<0.005	<3	49	0.08	52	0.083	52	0.083	3.9
BH107	0.3 - 0.4	Coarse	9.9	<0.005	<3	<5	<0.01	<5	<0.005	<5	<0.005	<0.75
	2.5 - 2.9	Fine	3.8	<0.005	<3	48	0.08	49	0.078	49	0.078	3.7
	4.7 - 5.0	Fine	4.2	<0.005	<3	27	0.04	32	0.052	32	0.052	2.4

Notes:

1. Material type based on field texture assessment or laboratory report.
2. Total Actual Acidity. Highlighted values exceed ASSMAC (1998) action criteria.
3. Chromium Reducible Sulfur. Highlighted values exceed ASSMAC (1998) action criteria.
4. Percentage net acid soluble sulfur. Highlighted values exceed ASSMAC (1998) action criteria.
5. From laboratory test results (refer to laboratory test certificates). Calculated using a FOS of 1.5.

Attachment D: Laboratory Documentation

SOIL ANALYSIS CHAIN OF CUSTODY FORM

Additional Testing												
Name	P2208688: Edinburgh Street, Marrickville, NSW											
Martens Contact Officer	Robert Mehaffey				Contact Email	rmehaffey@martens.com.au						
Sampling and Shipping	Sample Date	24/03/2022		Dispatch Date	25/03/2022		Turnaround Time		standard			
	Our Reference	P2208688COC02V01			Shipping Method (X)	Hand		Post		Courier	X	
	On Ice (X)	X	No Ice (X)		Other (X)							
Laboratory												
Name	EnviroLab											
Sample Delivery Address	12 Ashley Street, Chatswood											
Delivery Contact	Name	Sample Receipt		Phone	9910 6200		Fax		Email	samplereceipt@envirolabservices.com.au		
Please Send Report By (X)	Post		Fax		Email	X	Reporting Email Address		rmehaffey@martens.com.au			
									gtaylor@martens.com.au martens@esdat.com.au			

Sample ID	Sample type	SCr suite	Combo 6a	BHM	TRH	BTEXN	Hold
1 BH101/1.4 - 1.6	Zip lock	X					X
2 BH102/1.4 - 1.6	Zip lock	X					X
3 BH103/1.5 - 1.7	Zip lock	X					X
4 BH103/1.8 - 2.0	Zip lock	X					X
5 BH104/1.0 - 1.2	Zip lock	X					X
6 BH105/2.5 - 3.0	Zip lock	X					X
7 BH105/4.8 - 5.1	Zip lock	X					X
8 BH106/1.7 - 2.0	Zip lock	X					X
9 BH106/3.0 - 3.2	Zip lock	X					X
10 BH106/5.1 - 5.3	Zip lock	X					X
11 BH107/2.5 - 2.9	Zip lock	X					X
12 BH107/4.7 - 5.0	Zip lock	X					X
13 BH101/0.15 - 0.3	Jar		X				
14 BH101/0.5 - 0.7	Jar						X
15 BH102/0.2 - 0.3	Jar		X				



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Job No: 291952

Date Received: 25/3/22

Time Received: 15:25

Received by: VJ

Temp: Cool/Ambient

Cooling: Inlet/Repack 11°C

Security: Intact/Broken/None

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ABN 85 070 240 890 ACN 070 240 890

SOIL ANALYSIS CHAIN OF CUSTODY

Sample ID	Sample type	SCr suite	Combo 6a	BHM	TRH	BTEXN	Hold
16 BH103/0.2 - 0.3	Jar		X				
17 BH103/0.4 - 0.5	Jar						X
18 BH105/0.15 - 0.25	Jar	X					
19 BH106/0.2 - 0.3	Jar						X
20 BH106/0.5 - 0.6	Jar						X
21 BH106/1.0 - 1.1	Jar						X
22 BH107/0.3 - 0.4	Jar	X					
23 BH107/0.8 - 0.9	Jar						X
24 DUP01	Jar			X			
25 Trip spike	Vial					X	
26 Trip blank	Vial				X		

* 2919520
25/3/22



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CERTIFICATE OF ANALYSIS 291952

Client Details

Client	Martens & Associates Pty Ltd
Attention	Robert Mehaffey
Address	Suite 201, 20 George St, Hornsby, NSW, 2077

Sample Details

Your Reference	<u>P2208688: Edinburgh Street, Marrickville, NSW</u>
Number of Samples	26 Soil
Date samples received	25/03/2022
Date completed instructions received	25/03/2022

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.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by 01/04/2022

Date of Issue 01/04/2022

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Asbestos Approved By

Analysed by Asbestos Approved Analyst: Panika Wongchanda

Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Dragana Tomas, Senior Chemist

Hannah Nguyen, Metals Supervisor

Lucy Zhu, Asbestos Supervisor

Priya Samarawickrama, Senior Chemist

Steven Luong, Senior Chemist

Thomas Beenie, Lab Technician

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		291952-13	291952-15	291952-16	291952-25	291952-26
Your Reference	UNITS	BH101/0.15 –0.3	BH102/0.2 –0.3	BH103/0.2 –0.3	Trip spike	Trip blank
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/03/2022	29/03/2022	29/03/2022	29/03/2022	29/03/2022
Date analysed	-	29/03/2022	29/03/2022	29/03/2022	29/03/2022	29/03/2022
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	[NA]	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	[NA]	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	[NA]	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	100%	[NA]
Toluene	mg/kg	<0.5	<0.5	<0.5	100%	[NA]
Ethylbenzene	mg/kg	<1	<1	<1	100%	[NA]
m+p-xylene	mg/kg	<2	<2	<2	100%	[NA]
o-Xylene	mg/kg	<1	<1	<1	100%	[NA]
Naphthalene	mg/kg	<1	<1	<1	[NA]	[NA]
Total +ve Xylenes	mg/kg	<1	<1	<1	[NA]	[NA]
Surrogate aaa-Trifluorotoluene	%	83	93	97	102	[NA]

svTRH (C10-C40) in Soil				
Our Reference		291952-13	291952-15	291952-16
Your Reference	UNITS	BH101/0.15 -0.3	BH102/0.2 -0.3	BH103/0.2 -0.3
Type of sample		Soil	Soil	Soil
Date extracted	-	29/03/2022	29/03/2022	29/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	101	95	99

PAHs in Soil				
Our Reference		291952-13	291952-15	291952-16
Your Reference	UNITS	BH101/0.15 –0.3	BH102/0.2 –0.3	BH103/0.2 –0.3
Type of sample		Soil	Soil	Soil
Date extracted	-	29/03/2022	29/03/2022	29/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	<0.1	0.7
Anthracene	mg/kg	0.1	<0.1	0.2
Fluoranthene	mg/kg	0.6	<0.1	1.7
Pyrene	mg/kg	0.6	<0.1	1.7
Benzo(a)anthracene	mg/kg	0.4	<0.1	1.5
Chrysene	mg/kg	0.4	<0.1	1.2
Benzo(b,j+k)fluoranthene	mg/kg	0.6	<0.2	2.2
Benzo(a)pyrene	mg/kg	0.3	<0.05	1.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	0.7
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.3
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	0.9
Total +ve PAH's	mg/kg	3.7	<0.05	13
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	2.2
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	<0.5	2.2
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	<0.5	2.2
Surrogate p-Terphenyl-d14	%	79	78	80

Organochlorine Pesticides in soil				
Our Reference		291952-13	291952-15	291952-16
Your Reference	UNITS	BH101/0.15 –0.3	BH102/0.2 –0.3	BH103/0.2 –0.3
Type of sample		Soil	Soil	Soil
Date extracted	-	29/03/2022	29/03/2022	29/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	75	76

Organophosphorus Pesticides in Soil				
Our Reference		291952-13	291952-15	291952-16
Your Reference	UNITS	BH101/0.15 –0.3	BH102/0.2 –0.3	BH103/0.2 –0.3
Type of sample		Soil	Soil	Soil
Date extracted	-	29/03/2022	29/03/2022	29/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	75	76

PCBs in Soil				
Our Reference		291952-13	291952-15	291952-16
Your Reference	UNITS	BH101/0.15 –0.3	BH102/0.2 –0.3	BH103/0.2 –0.3
Type of sample		Soil	Soil	Soil
Date extracted	-	29/03/2022	29/03/2022	29/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	75	76

Acid Extractable metals in soil						
Our Reference		291952-13	291952-15	291952-16	291952-24	291952-27
Your Reference	UNITS	BH101/0.15 –0.3	BH102/0.2 –0.3	BH103/0.2 –0.3	DUP01	BH101/0.15 –0.3 - [TRIPLICATE]
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Arsenic	mg/kg	10	<4	7	<4	10
Cadmium	mg/kg	<0.4	<0.4	0.7	<0.4	<0.4
Chromium	mg/kg	9	8	18	8	6
Copper	mg/kg	22	2	94	7	17
Lead	mg/kg	62	11	1,700	25	120
Mercury	mg/kg	0.2	<0.1	0.3	<0.1	0.1
Nickel	mg/kg	12	2	12	2	12
Zinc	mg/kg	51	6	1,400	27	27

Moisture					
Our Reference		291952-13	291952-15	291952-16	291952-24
Your Reference	UNITS	BH101/0.15 -0.3	BH102/0.2 -0.3	BH103/0.2 -0.3	DUP01
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	29/03/2022	29/03/2022	29/03/2022	29/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Moisture	%	23	11	19	11

Asbestos ID - soils				
Our Reference		291952-13	291952-15	291952-16
Your Reference	UNITS	BH101/0.15 –0.3	BH102/0.2 –0.3	BH103/0.2 –0.3
Type of sample		Soil	Soil	Soil
Date analysed	-	30/03/2022	30/03/2022	30/03/2022
Sample mass tested	g	Approx. 40g	Approx. 45g	Approx. 40g
Sample Description	-	Grey coarse-grained soil & rocks	Brown clayey soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
		Organic fibres detected	Organic fibres detected	Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Chromium Suite						
Our Reference		291952-1	291952-2	291952-3	291952-4	291952-5
Your Reference	UNITS	BH101/1.4 –1.6	BH102/1.4 –1.6	BH103/1.5 –1.7	BH103/1.8 –2.0	BH104/1.0 –1.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
pH _{kcl}	pH units	3.9	4.4	4.0	4.0	6.9
s-TAA pH 6.5	%w/w S	0.12	0.06	0.09	0.14	<0.01
TAA pH 6.5	moles H ⁺ /t	74	40	56	86	<5
Chromium Reducible Sulfur	%w/w	0.007	0.006	0.006	<0.005	<0.005
a-Chromium Reducible Sulfur	moles H ⁺ /t	4	4	4	<3	<3
S _{HCl}	%w/w S	0.049	0.049	0.044	0.053	[NT]
S _{KCl}	%w/w S	0.039	0.044	0.038	0.053	[NT]
S _{NAS}	%w/w S	0.010	0.005	0.006	<0.005	[NT]
ANC _{BT}	% CaCO ₃	[NT]	[NT]	[NT]	[NT]	0.50
s-ANC _{BT}	%w/w S	[NT]	[NT]	[NT]	[NT]	0.16
s-Net Acidity	%w/w S	0.14	0.074	0.10	0.14	<0.005
a-Net Acidity	moles H ⁺ /t	84	46	63	89	<5
Liming rate	kg CaCO ₃ /t	6	3	5	7	<0.75
a-Net Acidity without ANCE	moles H ⁺ /t	84	46	63	89	<5
Liming rate without ANCE	kg CaCO ₃ /t	6.3	3.5	4.7	6.7	<0.75
s-Net Acidity without ANCE	%w/w S	0.14	0.074	0.10	0.14	<0.005

Chromium Suite						
Our Reference		291952-6	291952-7	291952-8	291952-9	291952-10
Your Reference	UNITS	BH105/2.5 –3.0	BH105/4.8 –5.1	BH106/1.7 –2.0	BH106/3.0 –3.2	BH106/5.1 –5.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
pH _{KCl}	pH units	4.0	4.0	3.8	3.8	3.9
s-TAA pH 6.5	%w/w S	0.12	0.08	0.14	0.08	0.08
TAA pH 6.5	moles H ⁺ /t	75	49	86	49	49
Chromium Reducible Sulfur	%w/w	0.007	<0.005	<0.005	<0.005	<0.005
a-Chromium Reducible Sulfur	moles H ⁺ /t	5	<3	<3	<3	<3
S _{HCl}	%w/w S	0.061	0.024	0.018	0.031	0.025
S _{KCl}	%w/w S	0.028	0.022	0.017	0.031	0.021
S _{NAS}	%w/w S	0.033	<0.005	<0.005	<0.005	<0.005
ANC _{BT}	% CaCO ₃	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC _{BT}	%w/w S	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.16	0.081	0.14	0.080	0.083
a-Net Acidity	moles H ⁺ /t	100	51	89	50	52
Liming rate	kg CaCO ₃ /t	7.6	4	7	4	4
a-Net Acidity without ANCE	moles H ⁺ /t	100	51	89	50	52
Liming rate without ANCE	kg CaCO ₃ /t	7.6	3.8	6.7	3.8	3.9
s-Net Acidity without ANCE	%w/w S	0.16	0.081	0.14	0.080	0.083

Chromium Suite					
Our Reference		291952-11	291952-12	291952-18	291952-22
Your Reference	UNITS	BH107/2.5 –2.9	BH107/4.7 –5.0	BH105/0.15 – 0.25	BH107/0.3 –0.4
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022
pH _{KCl}	pH units	3.8	4.2	5.6	9.9
s-TAA pH 6.5	%w/w S	0.08	0.04	<0.01	<0.01
TAA pH 6.5	moles H ⁺ /t	48	27	<5	<5
Chromium Reducible Sulfur	%w/w	<0.005	<0.005	0.02	<0.005
a-Chromium Reducible Sulfur	moles H ⁺ /t	<3	<3	11	<3
S _{HCl}	%w/w S	0.039	0.032	[NT]	[NT]
S _{KCl}	%w/w S	0.036	0.025	[NT]	[NT]
S _{NAS}	%w/w S	<0.005	0.007	[NT]	[NT]
ANC _{BT}	% CaCO ₃	[NT]	[NT]	[NT]	16
s-ANC _{BT}	%w/w S	[NT]	[NT]	[NT]	5.1
s-Net Acidity	%w/w S	0.078	0.052	0.025	<0.005
a-Net Acidity	moles H ⁺ /t	49	32	15	<5
Liming rate	kg CaCO ₃ /t	4	2	1	<0.75
a-Net Acidity without ANCE	moles H ⁺ /t	49	32	15	<5
Liming rate without ANCE	kg CaCO ₃ /t	3.7	2.4	1.2	<0.75
s-Net Acidity without ANCE	%w/w S	0.078	0.052	0.025	<0.005

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
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. Based on National acid sulfate soils identification and laboratory methods manual June 2018. 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 results reported.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			29/03/2022	13	29/03/2022	29/03/2022		29/03/2022	[NT]
Date analysed	-			29/03/2022	13	29/03/2022	29/03/2022		29/03/2022	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	13	<25	<25	0	91	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	13	<25	<25	0	91	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	13	<0.2	<0.2	0	98	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	13	<0.5	<0.5	0	96	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	13	<1	<1	0	85	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	13	<2	<2	0	87	[NT]
o-Xylene	mg/kg	1	Org-023	<1	13	<1	<1	0	89	[NT]
Naphthalene	mg/kg	1	Org-023	<1	13	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	93	13	83	81	2	97	[NT]

Client Reference: P2208688: Edinburgh Street, Marrickville, NSW

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			29/03/2022	13	29/03/2022	29/03/2022		29/03/2022	[NT]
Date analysed	-			30/03/2022	13	30/03/2022	30/03/2022		30/03/2022	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	13	<50	<50	0	94	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	13	<100	<100	0	99	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	13	<100	<100	0	121	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	13	<50	<50	0	94	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	13	<100	<100	0	99	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	13	<100	<100	0	121	[NT]
Surrogate o-Terphenyl	%		Org-020	98	13	101	98	3	107	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			29/03/2022	13	29/03/2022	29/03/2022		29/03/2022	[NT]
Date analysed	-			30/03/2022	13	30/03/2022	30/03/2022		30/03/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	80	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	81	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	80	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	13	0.3	0.2	40	80	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	13	0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	13	0.6	0.4	40	84	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	13	0.6	0.4	40	87	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	13	0.4	0.3	29	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	13	0.4	0.2	67	89	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	13	0.6	0.4	40	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	13	0.3	0.2	40	76	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	13	0.2	0.1	67	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	13	0.2	0.2	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	87	13	79	79	0	81	[NT]

Client Reference: P2208688: Edinburgh Street, Marrickville, NSW

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			29/03/2022	13	29/03/2022	29/03/2022		29/03/2022	[NT]
Date analysed	-			30/03/2022	13	30/03/2022	30/03/2022		30/03/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	80	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	82	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	77	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	85	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	84	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	82	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	86	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	80	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	72	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	82	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	83	13	78	77	1	78	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			29/03/2022	13	29/03/2022	29/03/2022		29/03/2022	[NT]
Date analysed	-			30/03/2022	13	30/03/2022	30/03/2022		30/03/2022	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	100	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	79	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	65	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	103	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	88	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	64	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	76	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	83	13	78	77	1	78	[NT]

Client Reference: P2208688: Edinburgh Street, Marrickville, NSW

QUALITY CONTROL: PCBs in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			29/03/2022	13	29/03/2022	29/03/2022		29/03/2022	[NT]
Date analysed	-			30/03/2022	13	30/03/2022	30/03/2022		30/03/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	13	<0.1	<0.1	0	90	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	13	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	83	13	78	77	1	78	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			30/03/2022	13	30/03/2022	30/03/2022		30/03/2022	[NT]
Date analysed	-			30/03/2022	13	30/03/2022	30/03/2022		30/03/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	13	10	12	18	100	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	13	<0.4	<0.4	0	99	[NT]
Chromium	mg/kg	1	Metals-020	<1	13	9	7	25	104	[NT]
Copper	mg/kg	1	Metals-020	<1	13	22	29	27	99	[NT]
Lead	mg/kg	1	Metals-020	<1	13	62	31	67	102	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	13	0.2	<0.1	67	103	[NT]
Nickel	mg/kg	1	Metals-020	<1	13	12	20	50	107	[NT]
Zinc	mg/kg	1	Metals-020	<1	13	51	31	49	104	[NT]

QUALITY CONTROL: Chromium Suite				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/03/2022	1	30/03/2022	30/03/2022		30/03/2022	[NT]
Date analysed	-			30/03/2022	1	30/03/2022	30/03/2022		30/03/2022	[NT]
pH _{KCl}	pH units		Inorg-068	[NT]	1	3.9	3.9	0	94	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	1	0.12	0.12	0	[NT]	[NT]
TAA pH 6.5	moles H ⁺ /t	5	Inorg-068	<5	1	74	74	0	82	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	1	0.007	<0.005	33	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H ⁺ /t	3	Inorg-068	<3	1	4	<3	29	110	[NT]
S _{HCl}	%w/w S	0.005	Inorg-068	<0.005	1	0.049	0.048	2	[NT]	[NT]
S _{KCl}	%w/w S	0.005	Inorg-068	<0.005	1	0.039	0.040	3	[NT]	[NT]
S _{NAS}	%w/w S	0.005	Inorg-068	<0.005	1	0.010	0.008	22	[NT]	[NT]
ANC _{BT}	% CaCO ₃	0.05	Inorg-068	<0.05	1	[NT]	[NT]		[NT]	[NT]
s-ANC _{BT}	%w/w S	0.05	Inorg-068	<0.05	1	[NT]	[NT]		[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	1	0.14	0.13	7	[NT]	[NT]
a-Net Acidity	moles H ⁺ /t	5	Inorg-068	<5	1	84	80	5	[NT]	[NT]
Liming rate	kg CaCO ₃ /t	0.75	Inorg-068	<0.75	1	6	6	0	[NT]	[NT]
a-Net Acidity without ANCE	moles H ⁺ /t	5	Inorg-068	<5	1	84	80	5	[NT]	[NT]
Liming rate without ANCE	kg CaCO ₃ /t	0.75	Inorg-068	<0.75	1	6.3	6.0	5	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	1	0.14	0.13	7	[NT]	[NT]

QUALITY CONTROL: Chromium Suite				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	30/03/2022	30/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	30/03/2022	30/03/2022		[NT]	[NT]
pH _{kcl}	pH units		Inorg-068	[NT]	11	3.8	3.8	0	[NT]	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	[NT]	11	0.08	0.08	0	[NT]	[NT]
TAA pH 6.5	moles H ⁺ /t	5	Inorg-068	[NT]	11	48	49	2	[NT]	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	[NT]	11	<0.005	<0.005	0	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H ⁺ /t	3	Inorg-068	[NT]	11	<3	<3	0	[NT]	[NT]
S _{HCl}	%w/w S	0.005	Inorg-068	[NT]	11	0.039	[NT]		[NT]	[NT]
S _{KCl}	%w/w S	0.005	Inorg-068	[NT]	11	0.036	[NT]		[NT]	[NT]
S _{NAS}	%w/w S	0.005	Inorg-068	[NT]	11	<0.005	[NT]		[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	[NT]	11	0.078	[NT]		[NT]	[NT]
a-Net Acidity	moles H ⁺ /t	5	Inorg-068	[NT]	11	49	[NT]		[NT]	[NT]
Liming rate	kg CaCO ₃ /t	0.75	Inorg-068	[NT]	11	4	[NT]		[NT]	[NT]
a-Net Acidity without ANCE	moles H ⁺ /t	5	Inorg-068	[NT]	11	49	[NT]		[NT]	[NT]
Liming rate without ANCE	kg CaCO ₃ /t	0.75	Inorg-068	[NT]	11	3.7	[NT]		[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	[NT]	11	0.078	[NT]		[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.

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.

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.

We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.

Note: Samples 291952-13, 15, 16 were sub-sampled from jars provided by the client.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 291952-13 for Pb,Ni & Zn. Therefore a triplicate result has been issued as laboratory sample number 291952-27.