Preliminary Site Investigation with Limited Sampling

Middle Head Oval Amenities Building

Mosman Municipal Council, C/O Archer Office Pty Ltd

Reference: 754-SYDEN349808-R01- Rev1-PSI-Middle Head Oval

15 May 2024

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PREPARED FOR

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QUALITY INFORMATION

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This report should be read in conjunction with the “Important information about your Tetra Tech Coffey Environmental Report” attached.

EXECUTIVE SUMMARY

Mosman Municipal Council (Council) C/O Archer Office Pty Ltd (Archer), require a Preliminary Site Investigation (PSI) with Limited Soil Sampling to support a Development Application (DA) for the redevelopment of the Middle Head Oval Amenities Building at Middle Head Oval, located 1110 Middle Head Road, Mosman NSW (the site).

It is understood that the redevelopment will involve the demolition of an existing building, construction of a new building containing public amenities, kiosk and sports club facilities, and a new shelter over existing tiered seating. Between the two structures will be a new landscaped community space. Other areas of the site will be soft and hard landscaped.

Tetra Tech Coffey Pty Ltd (Coffey) have been engaged by Council to undertake the PSI and identify potential contamination sources that may pose a risk to human health and the environment during redevelopment of the site.

The objectives of the PSI were to:

- Preliminary assess whether contamination is likely to exist at the site and provide recommendations for further assessment, management or remediation (if required).
- Provide an opinion on the suitability for the site for the proposed redevelopment in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021.

This investigation involved a desktop site history review, site walkover and a limited soil investigation.

The desktop study and site history review identified the existing club house building was constructed between 1982 and 1986 and has remained relatively unchanged since. Prior to this, the site was occasionally used as a car park (between 1961 and 1986), likely associated with the HMAS Penguin, west of the site.

The surrounding land became partially developed between 1930 and 1943. Middle Head Oval was constructed between 1943 and 1951. HMAS Penguin has been present since 1942.

The site has not been listed on any public registers in relation to contamination. HMAS Penguin, immediately west is part of the Department of Defence's 3 Year RCIP, and is listed as containing known contamination. Information regarding the type and extent of this contamination was not available on public records.

Review of available records, and observations made during a site walkover has identified the following potential contamination sources and AECs within the site:

- Potential for hazardous building materials to be present within the existing site structures.
- Historical and current use of pesticides at localised areas across the site.
- Potential for imported fill material of unknown origin and quality.
- Potential for onsite migration of PFAS contamination in surface runoff from adjacent HMAS Penguin.

A limited soil investigation was undertaken which included soil sampling from 8 hand augered boreholes, collected of two surface soils from beneath the existing site building and analysis of one ACM fragment. The results of this limited soil investigation identified the following in relation to soil contamination at the site:

- The subsurface lithology was described as a of topsoil, overlying a sandy / clayey fill material (between 0.4m to 1.6m thick), underlain by residual clays and sandstone bedrock. Inert foreign material was observed within the fill, which may not be deemed to be acceptable from an aesthetic perspective within garden/soft landscaped areas as part of the final design for the proposed redevelopment, however, could be managed during redevelopment.
- Asbestos in the form of a fibre cement sheet fragment was identified on the ground surface within the southern portion of the site by Coffey, which was removed as a sample during the fieldwork. An Asbestos Materials Clearance Inspection was undertaken by ADE Consulting Group Pty Ltd (ADE) on 3rd May 2024 which indicates that additional fragments of ACM were subsequently removed from the ground surface within this area by a SafeWork NSW Class A licensed asbestos removal company. Given the limitations

and findings of the investigation, there is some uncertainty regarding whether ACM impacts may be more widespread within fill (beneath the surface). Asbestos if present and disturbed may pose a potential risk to future site users. ACM impacted soil, if present, could be remediated / managed as part of the redevelopment.

- Exceedances of TRH and PAHs above the adopted ecological and human health criteria (applicable to public open space land uses) were reported in fill material in borehole BH7, likely associated with the importation of uncontrolled fill including possible coke. The identified TRH and PAH impacted soil may pose unacceptable risks to human health and the environment during re-development and future use without remediation / management. Given the heterogeneity of the fill encountered, the lateral extent of impact is not well defined; further investigation in this area may provide greater confidence on the extent and volume of TRH and PAH impacted soil requiring remediation / management.
- The potential for groundwater to be impacted with COPC associated with impacted fill at the site is considered to be low given that groundwater was not encountered during the fieldwork to the depth of bedrock, the anticipated depth to groundwater (i.e. greater than 10mbgl within bedrock), the leachability of TRHs and PAHs from soil impacted with coke are anticipated to be low, and the extent of impact is expected to be relatively localised in the general vicinity of borehole BH7. Additionally, no beneficial uses of groundwater have been identified. As such further assessment of groundwater is not considered to be warranted at this stage. Further leachability assessment may be carried out to provide additional confidence, if required.

Based on the above, Coffey has identified an area within the site to the south of the proposed building where remediation/management of soil impacted with hydrocarbons would be required to render the site suitable for the proposed redevelopment, the extent of which can be determined through additional testing. Further investigation is also recommended to address uncertainties regarding the presence of asbestos in soil. However, remediation/management of hydrocarbon impacted soil (and asbestos if present) is deemed achievable subject to preparation and implementation of a Remedial Action Plan.

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LIST OF FIGURES (APPENDIX A)

APPENDICES

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
ACM	Asbestos Containing Material
AEC	Areas of Potential Environmental Concern
AS	Australian Standard
ASOPA	Australian School of Pacific Administration
BTEXN	Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene
BYDA	Before You Dig Australia
CEC	Cation Exchange Capacity
CLM	Contaminated Land Management
COC	Chain of Custody
COPCs	Contaminants of Potential Concern
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
CSM	Conceptual Site Model
DA	Development Application
DCP	Dynamic Cone Penetrometer
DO	Dissolved oxygen
DP	Deposited Plan
DQOs	Data quality objectives
DQIs	Data quality indicators
EC	Electrical conductivity
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
EPA	Environment Protection Authority
GDE	Groundwater Dependent Ecosystems
HAZMAT	Hazardous Materials Survey
HIL	Health Investigation Level
HSL	Health Screening Level
km	Kilometres
LAA	Licensed Asbestos Accessor
LNAPL	Light non-aqueous phase liquid
LOR	Limit of reporting
m	Meters
mAHD	Metres in Australian Height Datum
mBGL	Metres below ground level
mBTOC	Metres below top of casing
mg/kg	Milligrams per kilogram

Acronyms/Abbreviations	Definition
mg/L	Milligrams per litre
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection (Assessment of Site Contamination) Measure
NPWS	The National Parks and Wildlife Service
NSW	New South Wales
OCPs	Organochlorine pesticides
OPPs	Organophosphorus pesticides
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Poly-chlorinated biphenyls
PFAS	Per- and Poly-Fluoroalkyl Substances
PSI	Preliminary Site Investigation
PID	Photo-ionisation detector
POEO	Protection of the Environment Operations
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RCIP	Regional Contamination Investigation Program
RPDs	Relative Percentage Difference
SOPs	Standard operating procedures
SPR	Source-Pathway-Receptor
TEQ	Toxicity equivalent quotient
TOC	Total Organic Carbon
TRH	Total recoverable hydrocarbons
UXO	Unexploded Ordnance
WW2	World War 2
µg/kg	Micrograms per kilogram
µg/L	Micrograms per litre

1. INTRODUCTION

1.1 GENERAL

Mosman Municipal Council (Council) C/O Archer Office Pty Ltd (Archer), requested a Preliminary Site Investigation (PSI) with Limited Soil Sampling be prepared to support a Development Application (DA) for the redevelopment of the Middle Head Oval Amenities Building at Middle Head Oval, located at Middle Head Road, Mosman NSW (the site). The site location plan is provided in Figure 1, Appendix A, the site area is shown in Figure 2, Appendix A.

It is understood that the redevelopment will involve the demolition of an existing building, construction of a new building containing public amenities, kiosk and sports club facilities, and a new shelter over existing tiered seating. Between the two structures will be a new landscaped community space. Other areas of the site will be soft and hard landscaped. A copy of the Development Concept Design is provided in Appendix B.

Tetra Tech Coffey Pty Ltd (Coffey) have been engaged by Council to undertake the PSI and identify potential contamination sources that may pose a risk to human health and the environment during redevelopment of the site.

1.2 OBJECTIVES

The objectives of the PSI were to:

- Preliminary assess whether contamination is likely to exist at the site and provide recommendations for further assessment, management or remediation (if required).
- Provide an opinion on the suitability for the site for the proposed redevelopment in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021.

1.3 SCOPE OF WORKS

To meet the above objectives, and in accordance with NSW Environmental Protection Authority (EPA) guidance, Coffey completed the following scope of works:

- A desktop review of the information sources including:
  - Local geology, hydrogeology, topography and acid sulfate soil risk maps.
  - A selection of relevant historical aerial photographs covering the site and the surrounds.
  - Review of local Council Section 10.7 Certificate in relation to the site.
  - A current and historical titles search.
  - A review of business records for the site and land immediately surrounding the site.
  - Registered groundwater bore information in the public register held by NSW Office of Water.
  - Contaminated land records and environmental protection licence information in the public registers held by the NSW Environment Protection Authority (EPA) and other government agencies.
- A walkover of the site was undertaken to observe current activities and conditions within the site, and adjacent properties.
- A limited soil investigation including:
  - Review of available underground service plans, including Before-You-Dig Australia (BYDA).
  - Underground service clearance by an accredited service locator
  - Collection of soil samples from eight boreholes (BH1 – BH8) using hand tools.

  - Screening of soil samples for potential presence of Volatile Organic Compounds (VOCs), using a Photo-Ionisation Detector (PID) fitted with a 10.6 eV lamp.
  - Laboratory analysis of selected soil samples for a range of Contaminants of Potential Concern (COPCs).
- Preparation of this report, in general accordance with relevant guidelines including the *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020), and Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (the 'ASC NEPM') (NEPC, 2013).

Furthermore, this report has been updated (as Revision 1) to include a review of an Asbestos Materials Clearance Inspection Report prepared by ADE Consulting Group Pty Ltd (ADE) (discussed in Section 10.3).

2. SITE INFORMATION

2.1 SITE LOCATION

The site location information is summarised in Table 2-1 below:

Table 2-1: Site Information

Item	Description
Site Address	Middle Head Road, Mosman NSW 2088
Coordinates (centre of site)	Latitude: 33°49'39", Longitude: 151°15'41" (Approximate centre of site; Source: Google Earth)
Site Area	1,900m^2 (approx. 0.2 hectares)
Title Identification	Part of Lot 203 and Lot 201 of Deposited Plan (DP) 1022020
Current Land Zoning	Infrastructure (SP2) under the Mosman Local Environmental Plan 2012.
Local Government Authority	Mosman Municipal Council
Site Owner	Mosman Municipal Council
Current Land Use	At the time of the inspection, the site was occupied by a brick and steel building used as a club room for the adjoining Middle Head Oval.

2.2 SITE DESCRIPTION

An experienced environmental scientist attended the site to undertake a site walkover on 4 April 2024. The key site features include:

- The site is occupied by a brick and steel building used as a club room for the adjoining Middle Head Oval, with concrete steps and a paved area to the north.
- The building consists of change rooms, bathroom facilities, a kiosk, club room and storage of sporting equipment.
- A lower basement level is present within the southern portion of the building, which is used to store sporting equipment. Exposed natural sandstone outcrops were observed.
- The area surrounding the building was grassed, with a paved footpath present along the northern boundary adjacent to the Oval.

- Concrete spectator seating was present within the eastern portion of the site.
- The topography of the site sloped north-east towards the Oval, with a gully / drain present along the western portion of the site, sloping south-east towards the basement entrance.
- Evidence of fill material was noted in the northern and eastern portion of the site, with the elevation being slightly higher.
- A concrete paved car park and driveway (to the basement entrance) was present within the north-western portion of the site.
- An above ground water tank was present on the south-eastern end of the building, which collects rain-water from the roof of the building.
- Exposed natural soils, with some gravel (including inclusions of what appeared to be coke (shown on Photo 8 in Appendix C) and fill were noted along the southern boundary, adjacent to Middle Head Road.
- A fragment of fibre cement sheeting, suspected to contain asbestos was observed within the gravel area. This fragment was collected for laboratory analysis (FC_1). Analytical laboratory analysis confirmed the fragment contains asbestos; this is discussed further in Section 10.
- Potential lead paint was observed on the building materials and potential asbestos was noted in the window casements. Noting that a Hazardous Materials Survey (HAZMAT) is being undertaken concurrently with this investigation.

Photographs of the site are provided in the photo log in Appendix C.

2.3 SURROUNDING LAND USES

Table 2-2 summarises the uses of surrounding land based on observations made from accessible areas within the site and site boundary during the walkover, and a review of recent, web-based aerial imagery.

Table 2-2: Surrounding Land Uses

Direction	
North	Middle Head Oval, including a grassed playing field and at-grade, asphalt carpark, followed by bushland (Sydney Harbour National Park), and Sydney Harbour.
East	Middle Head Oval, including a grassed playing field, bush land, Middle Head Cafe and a series of buildings within the Brick Barracks. Middle Head Road borders the southern site boundary, extending east of the site. The National Parks and Wildlife Service (NPWS) Storage and Maintenance Depot is present further to the east.
South	Middle Head Road followed by a number of building complexes including the Brick Barracks and Australian School of Pacific Administration (ASOPA).
West	Sealed asphalt road followed by HMAS Penguin. Balmoral Beach is located further west.

3. TECHNICAL AND REGULATORY FRAMEWORK

This PSI has been prepared in general accordance with, and with reference to, the following legislation, industry standards, codes of practice, and guidance documents, where relevant:

- NSW Work Health and Safety (WHS) Act 2011 (WHS Act 2011).
- NSW WHS Regulation 2017 (WHS Regulation 2017).
- Contaminated Land Management (CLM) Act, 1997 (CLM Act 1997).
- CLM Amendment Act 2008.
- National Environment Protection Council (NEPC) Act 1994 (NEPC Act 1994).
- National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (amended April 2013) (ASC NEPM).
- State Environmental Planning Policy (Resilience and Hazards) 2021, 2 March 2022 (Resilience and Hazards SEPP).
- NSW Environment Protection Authority (EPA), Contaminated Land Guidelines: Consultants Reporting on Contaminated Land, 2020 (NSW EPA 2020).
- CRC Care Technical Report No. 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, 2011 (CRCCARE 2011).
- PFAS National Environmental Management Plan (HEPA, 2020; Version 2.0) (PFAS NEMP)

4. ENVIRONMENTAL SITE SETTING

Table 4-1 presents a summary of information to describe the environmental setting of the site and surrounding land. Further detail and plans are provided within the Lotsearch report attached in Appendix D.

Table 4-1: Summary of Environmental Setting of Site and Surrounding Land

Aspect	Description
Topography	Available topographic mapping shows topography at the site is situated between an elevation of approximately 32 m to 34 mAHD. The regional topography consists of steep rises from the Harbour on either side of Middle Head, with the elevation across the peninsular gently undulating. Further detail on the elevation contours within the site and surrounding land is provided in Appendix D.
Geology & Soil Landscape	The 1:100,000 scale Geological Sheet 'Sydney' NSW Dept. Minerals and Energy (1991; Ed. 1) indicates the site and surrounding peninsular is underlain by the Triassic aged Hawkesbury Sandstone, which is typically described as a medium to coarse grained quartz sandstone with minor shale and laminate lenses. A dyke or vein is present approximately 44m east of the site. Available soil landscape information from the Atlas of Australian Soils provided within the Lotsearch Report (Appendix D) shows no soil data is available for the site. Immediately west of the site the soil landscape is mapped as 'Kandosol' which is described as dissected sandstone plateau of moderate to strong relief with sandstone pillars, ledges and slabs. Soil landscapes of Central and Eastern NSW identified the Lambert Soil landscape to be present on site. Which is described as undulating to tolling rises and low hills on Hawkesbury Sandstone. Soils are typically shallow (<50 cm) discontinuous Earthy sands, yellow earths and insides of benches. Acid sulfate soils are not known to occur within the site, land west of the site is mapped as extremely low probability of acid sulfate soils, sediments within Sydney Harbour are mapped as high probability. The site is not located within a dryland salinity risk area.
Hydrogeology	Groundwater is expected to occur at depth (>10 mBGL) within the fractured sandstone bedrock. Shallow groundwater would be expected to be limited to possible seepage in shallow soil at the interface of soils or fill (if present) and sandstone during periods of prolonged rainfall, however this is likely to drain relatively quickly along bedding planes and joints/fissures. No groundwater seepage was encountered in boreholes during this investigation. Available records from the NSW Office of Water indicate that there were no licensed groundwater bores within 1km of the site. Six licensed groundwater bores are located between 1,280 m and 1711 m west and north-west which are listed as functional monitoring bores and functioning water supply bores. The location of the licensed groundwater wells relative to the site is presented in Appendix D.
Hydrology	As the site is situated on a peninsula, Cobblers Bay is located north (approximately 160 m), Obelisk Bay is located approximately 240 m and 270 m south, and Middle Head / Sydney Harbour is located approximately 640 m east. Smaller freshwater tributaries may be present across the peninsular, discharging into Sydney Harbour, which is considered a marine environment.
Sensitive Ecological Environments	The following is noted with regard to potentially sensitive ecological environments: - There are no Ramsar Wetlands located within or immediately surrounding the site. - The NSW BioNet Atlas identified numerous native species listed as critically endangered, endangered, vulnerable and not listed within the Sydney Harbour National Park. - Native vegetation including Sydney Coastal Sandstone Dry Sclerophyll Forests, Northern Warm Temperate Rainforests, North Coast Wet Sclerophyll Forests, Sydney Coastal Heaths and Coastal Dune Dry Sclerophyll Forests are present around the peninsular within Sydney Harbour National Park. - Low potential groundwater dependant ecosystems (GDE) from national assessment are present approximately 214 m south-east and 460 m east of the site, within deeply dissected sandstone plateaus.

5. SITE HISTORY

5.1 HISTORICAL AERIAL PHOTOGRAPHS

A review of historical aerial photographs supplied by NSW Government Historical Imagery website is summarised in Table 5-1 below. The historical aerial photographs reviewed are provided in Appendix D.

Table 5-1: Summary of historic land uses based on aerial photographs

Date	Site Features	Features of Surrounding Land
1930	The site area is observed to be vacant and cleared of vegetation.	Surrounding land use appears to be vacant, cleared land, some vegetation is present around the coastline to the north and south. Middle Head Road is present along the southern site boundary, and Chowder Bay Road is present further to the south-west.
1943	The site remains relatively unchanged from the 1930 aerial photograph, with the exception of a small structure within the central southern portion of the site.	The surrounding land as been redeveloped, with large building complexes located west (HMAS Penguin) and south-east. Some bare soil areas and tracks are present north-east where the existing Oval is located.
1951	The previous small structure at the site has been removed. The surface appears to be exposed soil. Middle Head Oval to the north has been cleared / undergoing development, with the southern portion extending onto the site.	Middle Head Oval has been cleared / undergoing development. The remaining areas appear relatively unchanged.
1955/56	The site appears to be relatively unchanged with the exception of some small structures / vegetation present.	Middle Head Oval is constructed; however an area of vegetation remains within the centre. Some additional structures are present east of the Oval.
1961	The south-western and southern portion of the site appears to be used as a car park, which extended further to the west, adjacent to HMAS Penguin.	The vegetation within the centre of Middle Head Oval has now been removed/ The remaining area appears relatively unchanged.
1965 and 1970	The 1965 and 1970 aerial photographs are very similar. No vehicles can be seen parked on the site within these photographs.	The surrounding area appears to be relatively unchanged in both the 1965 and 1970 aerial photographs.
1978	The south-western corner of the site is being used as a car park again.	The surrounding area appears to be relatively unchanged, noting that there is an increase in vehicles within the car park north-west of the site.
1982	The site remains broadly similar to the previous photo.	The surrounding features remain the same as the previous photo.
1986	The club house building has been constructed on the site, within the south-western corner. Vehicles are parked within the south-western and southern portions of the site.	The surrounding features remain the same as the previous photo.
1991	The concrete spectator seating can be seen within the eastern portion of the site. The driveway to the basement of the club house can also be seen within the western portion of the site.	The surrounding features remain the same as the previous photo. The Oval is being used as a baseball field
1994	The site remains broadly similar to the previous photo.	The surrounding features remain the same as the previous photo. A building has been constructed south-east of the Oval.
2005	The site remains broadly similar to the previous photo.	The surrounding features remain the same as the previous photo.

Date	Site Features	Features of Surrounding Land
2007	The site remains broadly similar to the previous photo.	The surrounding features remain the same as the previous photo.
2011	The water tank can be seen on the eastern side of the club house. The remaining area of the site appears unchanged.	The surrounding features remain the same as the previous photo.
2014	Gravel can be seen within the southern portion of the site, adjacent to Middle Head Road. The remaining area of the site appears unchanged.	The structures associated with the use as the Oval as a baseball field have been removed.
2017	The site remains broadly similar to the previous photo.	With the exception of a soccer field now present on the oval, the surrounding features remain the same as the previous photo.
2020	The site remains broadly similar to the previous photo.	The soccer field is no longer present on the Oval
2023	The site remains broadly similar to the previous photo.	The Oval appears to be used as netball courts.

5.2 BUSINESS DIRECTORY SEARCH

Coffey conducted a review of historic business directory records for the period between 1950 and 1991. There were no historical business directory records recorded in the search.

5.3 PUBLIC RECORDS AND REGISTERS

Table 5-2: Summary of Records from Public Records and Registers

Register	Summary
NSW EPA Contaminated Land Public Record[1]	A search of the NSW EPA Contaminated Land Public Record was carried out on 3 April 2024. The search identified no contaminated sites notified to the NSW EPA in the Mosman suburb area. The search results are included in Appendix D.
NSW POEO Public Registers	A search of the NSW EPA POEO Public Registers, was undertaken on 3 April 2024 for: • Activities licensed by the NSW EPA under Schedule 1 of the POEO Act 1997. • Unlicensed premises regulated by the NSW EPA. The search did not identify any licensed activities within or in close proximity to the site. Former delicensed activities were identified in the vicinity of the site which included the application of herbicides along waterways throughout NSW. This is not considered to pose a significant risk of contamination at the site in the context of the proposed development. The search results are included in Appendix D.
Mining and Exploration	The site and surrounding area are listed to have historical mining title records, with titles held by various petroleum and mineral mining companies. There are no current mining and exploration titles or applications for the site. Tetra Tech Coffey is not aware of any mining being carried out at the site. The search results are included in Appendix D.
Former Gasworks	A search of NSW EPA List of Former Gasworks[2] was undertaken on the 3 April 2024. The search indicated that there are no known gasworks at or within 250m of the Site.

[1] Available: https://www.epa.nsw.gov.au/your-environment/contaminated-land/notified-and-regulated-contaminated-land/list-of-notified-sites
[2] https://www.epa.nsw.gov.au/your-environment/contaminated-land/other-contamination-issues/former-gasworks-sites

Register	Summary
	The search results are included in Appendix D.
Defence Site and Unexploded Ordnance	Tetra Tech Coffey understands that the Department of Defence is continuing to work with Commonwealth, local and State authorities, industry experts and the community in delivering a national program to investigate and manage the impacts resulting from the use of legacy firefighting foams containing per- and poly-fluoroalkyl substances (PFAS) on and around its bases. A Search of the records provided by Department of Defence indicates that HMAS Penguin (a Royal Australian Navy base located approximately 10m west of the site) as being a site which has been assessed by the Department of Defences under the 3 Year Regional Contamination Investigation Program (RCIP) and is listed as containing known contamination. Review of information on the Department of Defence website[3] did not provide further information regarding the outcomes of the assessment. There were no records for Unexploded Ordnance (UXO) in vicinity of the site, records were available for Potential Depth Charge UXO – Port Jackson, in two areas of the Sydney Harbour, located 1640 m south-east and 1860 m south-east, which were categorised as sea dumping of depth charges during World War two (WW2). These UXO are not considered to pose a significant risk of contamination at the site in the context of the proposed development. The search results are included in Appendix D.
Waste Management Facilities	A search of the National Waste Reporting Mapping Tool undertaken on 3 April 2024. The search identified no registered waste transfer facilities or landfill sites within the site or within 500m of the site. The search results are included in Appendix D.
NSW Government PFAS Investigation Programme	The NSW EPA is leading an investigation program to assess the legacy of Per- and poly-fluoroalkyl substances (PFAS) use across NSW. Current investigations are focused on sites where it is likely that large quantities of PFAS have been used. A search of the NSW EPA website[4] undertaken on 2 April 2024 did not identify properties within 1,000m of the site which are being investigated for PFAS use under the NSW Government PFAS Investigation Program.
Known James Hardie Waste Disposal Sites	• The NSW EPA published a summary project report titled Regulation Project – James Hardie Asbestos Waste Contamination Legacy in 2012. This report presented a summary of asbestos impacted sites resulting from former operations of James Hardie Industries and related entities (James Hardie). • A review of the report indicates that the site is not listed as a known James Hardie Waste Disposal Site, and no known James Hardie disposal site is listed within 1,000m of the Site. The search results are included in Appendix D.

[3] https://www.defence.gov.au/about/locations-property/regional-contamination-investigation-program
[4] https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program

5.4 PREVIOUS ENVIORNMENTAL ASSESSMENTS

No previous environmental of contamination assessments were provided for review from Council. A previous Geotechnical Investigation was provided for the adjoining Middle Head Oval, entitled:

- STS GeoEnvironmental (2016), Geotechnical Investigation, prepared for SMADA Electrical Pty Limited, Middle Head Oval, Middle Head Road, Mosman, NSW. Report no. 16/0078, project no. 20773/6520C, dated January 2016.

Coffey undertook a high-level review of this report, with the following key findings are presented below:

- This geotechnical report was prepared to assist with the installation of six new light towers at the Middle Head oval.
- Six boreholes using mechanical drilling rig, Dynamic Cone Penetrometer (DCP) tests, Subsurface lithology was described as a layer of topsoil and fill material, overlying residual clays and weathered shale and sandstone bedrock.
- Groundwater seepage was not observed however soils were very moist to wet near the soil-rock interface.
- The report provided advice on pile foundations for the light towers, based on the encountered bedrock (sandstone and shale).

5.5 SECTION 10.7 PLANNING CERTIFICATES

Coffey obtained the Section 10.7 Planning Certificate for Lot 203 and DP1022020. Coffey reviewed this certificate, noting the following in relation to contaminated land:

- This lot has **not** been designated significantly contaminated land or is the subject of an approved voluntary management proposal, ongoing maintenance order or has previously been the subject of a site audit statement.
- Council has **not** been notified that any residential premises at these lots have been listed on the Loose Fill Asbestos Register, as maintained by NSW Fair Trading.
- The subject site is **not** identified an area of outstanding biodiversity value under the Biodiversity Conservation Act 2016.
- With regards to loose-fill asbestos insulation, Council has **not** been notified that the land is identified on the register of residential premises under Division 1A of Part 8 of the Home Building Act 1989.

A copy of the Section 10.7 Planning Certificate is provided in Appendix D.

5.6 SUMMARY OF SITE INFORMATION

Based on the review of site history and publicly available information sources, a summary of site history information is provided below.

- The site appears to have been vacant from 1930 to 1961 from review of aerial photographs, and occasionally used as a car park between 1961 and 1986. The existing club house building was constructed between 1982 and 1986. The site layout has since remained relatively unchanged.
- The surrounding land became partially developed between 1930 and 1943. Middle Head Oval was constructed between 1943 and 1951. HMAS Penguin has been present since 1942 (public records indicate it opened on 14 July 1942 source: HMAS Penguin | Royal Australian Navy).
- From the site walkover and desktop review, several areas of potential environmental concern (AEC) were identified, which are discussed further in Section 6.
- The site has not been listed on any public registers in relation to contamination. HMAS Penguin, immediate west is part of the Department of Defence's 3 Year RCIP, and is listed as containing known contamination. Information regarding the type and extent of this contamination was not available on public records reviewed.
- Surrounding areas appear to various land uses, including Middle Head Oval, HMAS Penguin, ASOPA, Brick Barracks, and NPWS Storage and Maintenace depot.

6. PRELIMINARY CONCEPTUAL SITE MODEL

A preliminary conceptual side model (CSM) was developed based on the information reviewed and visual observations made during the site walkover. A CSM is a representation of site-related information regarding potential sources of contamination, receptors and exposure pathways.

Contamination, if present and not managed appropriately could pose a potential risk to human health or the environment. For an unacceptable risk to exist, there must be a plausible pollutant linkage between the source and a receptor by means of a transport mechanism (pathway).

6.1 POTENTIAL SOURCES OF CONTAMINATION

Based on the site history information and site observations, the following potentially contaminating activities/sources (denoted as Areas of Environmental Concern (AEC)) were identified:

- AEC1: Soils potentially impacted with hazardous building materials from demolition of a former building and/or weathering of current/former site structures that may contain hazardous building materials.
- AEC2: Historical and current use of pesticides at the site.
- AEC3: Imported fill material of unknown origin and quality at the site.
- AEC4: Potential for onsite migration of PFAS contamination in surface runoff from adjacent HMAS Penguin.

6.2 POTENTIAL RECEPTORS AND EXPOSURE ROUTES

Based on the proposed redevelopment, potential receptors to the AECs identified may include but not be limited to:

- Future users of the site from:
  - Vapour intrusion and inhalation of volatile contaminants.
  - Direct contact (dermal contact and ingestion).
  - Inhalation of dust and asbestos fibres.
- Future construction workers and intrusive maintenance workers from:
  - Direct contact (dermal contact and ingestion).
  - Vapour inhalation.
  - Inhalation of dust and asbestos fibres.
- Adjacent site users during redevelopment from.
  - Ingestion of dust and Inhalation of asbestos fibres.
- Terrestrial ecosystems from direct uptake and diffusion of COPCs in soil.
- Marine aquatic ecosystems of Sydney Harbour from dissolution/leaching of contaminants from soil to groundwater and offsite migration.

6.3 SUMMARY PRELIMINARY CONCEPTUAL SITE MODEL

A summary of the preliminary CSM is provided in Table 6-1.

Table 6-1: Summary of Preliminary Conceptual Site Model (Prior to Intrusive Investigation)

Potentially Contaminating Activity/Source and Description (AEC)	Potentially impacted media	Likelihood of Contamination* (prior to intrusive investigation)	Potential Chemicals of Concern
AEC1: Hazardous building materials **Weathering of current/former site structures that may contain hazardous building materials**	Topsoil/fill in the vicinity of former and current site structures. *Soil media potentially affected.*	Low to moderate likelihood of soil contamination.	Heavy metals (e.g., lead from lead-based paint), and asbestos
AEC2: Historical and Current use of pesticides	Near surface soils in the vicinity of current site structures and in localised areas across the site. *Soil media potentially affected.*	Low to moderate likelihood of soil contamination.	OCP, OPP and heavy metals (e.g., arsenic)
AEC3: Imported fill material of unknown origin and quality	Topsoil/fill across the site. *Soil media potentially affected.*	Moderate to high likelihood of soil contamination	TRH, BTEXN, PAHs, Heavy Metals (arsenic, cadmium, chromium, copper, mercury, lead, nickel and zinc), OCP, OPP, PCB, PFAS, Asbestos
AEC4: Potential for onsite migration of PFAS contamination in surface runoff from adjacent HMAS Penguin.	Topsoil/fill across the site. *Soil media potentially affected.*	Low to moderate likelihood of soil contamination.	PFAS.

Notes: TRH: Total recoverable hydrocarbons / BTEXN: Benzene, toluene, ethylbenzene, xylene and naphthalene / PAH: Polycyclic aromatic hydrocarbons / OCP: Organochlorine pesticides / OPP: Organophosphorus Pesticides / PFAS: Per- and Poly-Fluoroalkyl Substances / PCB: Polychlorinated biphenyls

** It is important to note that this is not an assessment of financial risk associated with the AEC in the event contamination is detected, but a qualitative assessment of the probability of contamination being detected at the potential AEC, based on the site history study and field observations.*

7. LIMITED SOIL INVESTIGATION

A limited soil investigation was undertaken concurrently with the PSI, with the aim of providing an indication of whether soil contamination may be present at the site.

A total of eight boreholes (BH1 to BH8) were progressed at the site on a relatively systematic grid within accessible portions of the site. The number of boreholes was chosen to meet the minimum recommended number of sampling locations for a grid-based sampling strategy outlined in the Sampling Design: Part 1 - Application (NSW EPA 2022), based on a site area of 1,900 m^2.

During the field investigation program, access to the basement level of the building was available, where exposed soils were observed. An additional two surface samples (GS_01 and GS_02) of fill were collected for laboratory analysis.

During the site walkover, a fragment of fibre cement sheeting suspected to contain asbestos was identified and sampled for asbestos laboratory analysis (FC_01). The fragment was described as bonded, and not pulverisable with hand pressure, a few centimetres in diameter with slightly angular to rounded edges, and a slightly weathered appearance.

The soil investigation and sampling method is detailed in Table 7-1 below. The location of each sampling location is shown in Figure 3, Appendix A.

Table 7-1: Soil Investigation and Sampling Method

Activity	Detail / Comments
Below Ground Service Clearance	A BYDA Underground Services Check was carried out prior to commencement of works. Investigation locations were also scanned by an underground service clearance sub-contractor to check for the presence of below ground services. Sampling locations were set up in areas cleared for below ground services.
Site Walkover	An experienced environmental consultant from Coffey completed a walkover survey to observe general conditions within accessible areas and gather data relevant to the assessment of potential contamination risks. A summary of the key site observations is provided in Section 2.2.
Borehole Drilling and Surface Sampling	Boreholes were advanced using a hand auger to a target depth of 2m, 0.5m into natural soil, or refusal, whichever occurred first. Samples were collected directly from the auger using a new disposable glove for collection of each sample. Sample intervals and methods are shown on the Borehole logs presented in Appendix E. The location of boreholes and surface samples are provided in Figure 3, Appendix A.
Soil Logging	Soil logging was undertaken by a suitably qualified and experienced Coffey environmental scientist in general accordance with Coffey's Standard Operating Practices (SOP), which is consistent with AS 1726-2017, Geotechnical Site Investigations and AS 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil. The presence/absence of potential asbestos-containing material (ACM), and/or other indicators of contamination (i.e. staining, odours) were also noted on the field logs where identified. The ground conditions encountered are presented within logs included in Appendix E.
Soil Sampling	Drilling and sampling works were undertaken by the Coffey environmental scientist completing the fieldworks. Soil logging, field screening and sampling activities were carried out by the Coffey environmental scientist. Soil samples collected targeted different horizons within fill materials and then at approximately 0.2 m to 0.5 m intervals thereafter or at changes in soil horizon or where indications of potential contamination were noted.

Activity	Detail / Comments
	Soil materials encountered at each sampling location were observed by a Coffey environmental scientist competent in the visual identification of materials suspected to contain asbestos. Soil samples collected for laboratory analysis were placed as quickly as practicable into glass sample jars with Teflon lined lids. Sample jars were filled to the top to minimise headspace. Visual, olfactory, and field screening data were recorded (refer borehole logs in Appendix E). Separate samples for asbestos analysis (approximately 50 g mass) were collected and placed in clean, zip lock bags supplied by the laboratory. Duplicate samples were collected by dividing the soil sample into two laboratory jars. These soils were not homogenised prior to splitting to avoid loss of volatile compounds.
Sample Nomenclature	Collected samples were given a unique sample identifier which was included on all sample bags and associated paperwork including field sheets and chain of custody forms. Sample labels were completed in indelible ink and included the following information: • Project number (i.e. SYDEN349808). • Sample identifier: • Date of sample collection. • Initials of sampler.
Sample Handling and Transportation	Sample collection, storage and transport were conducted in general accordance with the relevant Coffey SOP. Soil samples were immediately placed into an ice chilled cooler. The samples were dispatched to the contracted laboratories under chain of custody control. One trip spike and one trip blank sample were stored, transported, and analysed with the primary samples. COC documentation is provided in Appendix H.
Decontamination of sampling equipment	Non-disposable sampling equipment (hand auger) were decontaminated by scrubbing with Liquinox solution and rinsed with potable water between samples.

7.1 LABORATORY ANALYSIS

Soil samples were analysed by ALS Global Pty Ltd (ALS) as the primary laboratory and Eurofins Scientific (Eurofins) as the secondary laboratory. Both ALS and Eurofins hold NATA accredited analytical methods for the analytes selected.

The suite of analysis was selected based on a broad suite of contaminants of concern typically associated with uncontrolled fill, and the preliminary CSM (Section 6).

Selected soil samples were analysed for:

- TRH, BTEXN, PAHs, Heavy Metals (arsenic, cadmium, chromium, copper, mercury, lead, nickel and zinc)
- OCP, OPP, PCB
- PFAS
- Asbestos
- NEPM Ecological Screen: Iron, Cation Exchange Capacity (CEC), Total Organic Carbon (TOC), Clay content, pH (1:5) and Electrical Conductivity (1:5).

Samples were selected for analysis based on visual observations, PID results, and to provide spatial and lateral coverage. The samples analysed are provided in Table 1 in Appendix F.

7.2 QUALITY ASSURANCE / QUALITY CONTROL

A data validation assessment was undertaken to assess whether the laboratory data generated met the accuracy, precision, comparability, representativeness, and completeness and whether the data is suitable for assessing the site contamination conditions. A standalone Data Validation Assessment is presented in Section 9. The results of the Data Validation Assessment conclude that the data is directly usable for the purposes of this assessment.

8. ASSESSMENT CRITERIA

8.1 HEALTH BASED CRITERIA

In accordance with industry guidance and legislative requirements, Tier 1 environmental assessment criteria for this assessment were selected from the following guidelines:

- NEPC (2013); National Environmental Protection (Assessment of Site Contamination) Measure 1999 (the 'ASC NEPM').
- Friebel, Nadebaum (2011); Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, CRC Care Technical Report No. 10.
- PFAS National Environmental Management Plan (HEPA, 2020; Version 2.0) (PFAS NEMP).

Health assessment criteria have been adopted for this assessment based on the use of the site recreational public open space area with a building and soft landscaping. The proposed development plans are yet to be finalised.

Health assessment criteria are outlined in Table 8-1 and presented in Table 1 in Appendix F.

Table 8-1: Summary of Applicable Health Assessment Criteria

Activity	Source	Criteria Relevant	Applicable Pathway
Soil health-based investigation levels (HILs)	ASC NEPM 2013 PFAS NEMP 2020	Public Open Space / Recreational land use (HIL C) All soil depths and types Exposure to metals and organic substances	Direct contact (dermal contact and incidental ingestion and inhalation of soil / dust particles)
Soil HSLs (direct contact)	CRC CARE 2011	Public Open Space / Recreational land use (HSL C) Intrusive maintenance worker (shallow trench) (HSL-D) Exposure to petroleum hydrocarbons	Direct contact (dermal contact and incidental ingestion and inhalation of soil / dust particles)
Soil HSLs (vapour intrusion)	ASC NEPM 2013	Vapour intrusion / indoor air inhalation within a Public Open Space / Recreational land use (HSIL C) Sand soil type, range of depths, up to >2 m Exposure to petroleum hydrocarbons	Inhalation of soil vapours in Public Open Space / recreational setting.
Soil HSLs (Vapour intrusion)	CRCCARE 2011	Intrusive maintenance worker Sandy soil type and depth of 0-<2 m	Vapour inhalation within a shallow trench.

8.2 ASBESTOS

For asbestos in soil, an initial screening level of 0.1g/kg (0.01 % w/w equivalent) was adopted based on the laboratory detection limit for analysis of asbestos in non-homogenous samples using the methodology outlined in Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples (AS4964-2004). Furthermore, where trace analysis is carried out during analysis, an assessment criterion of 'no respirable fibres' was adopted; a detection of respirable fibres would indicate an exceedance of the assessment criteria.

8.3 ECOLOGICAL BASED CRITERIA

The proposed site concept plans (provided in Appendix B), involves a large proportion of the site as landscaped community space, with construction of a new building within the northern portion of the site. The tiered seating is proposed to remain within the eastern portion of the site however be re-landscaped. Given the preliminary nature of the design plans, ecological assessment criteria were considered to be applicable for the site.

To assess potential impact to on-site ecological receptors from contamination within the upper 2 m of the subsurface, ASC NEPM Schedule B1 presents ecological investigation levels (EILs) and ecological screening levels (ESLs) for different settings (e.g., areas of ecological significance, urban residential / public open space and commercial). The ESLs for urban residential / public open space were adopted.

Generic EILs were adopted for lead, arsenic, dichlorodiphenyltrichloroethane (DDT) and naphthalene, whilst site specific EILs were calculated for zinc, lead, copper, nickel and chromium based on site specific soil data for pH (8), CEC (6.4 cmol/kg), iron content (1.44%), Organic Carbon (2.3%) and clay content (14%). ASC NEPM EIL calculation spreadsheets are provided in Appendix I.

The Canadian Soil Quality Guidelines for Environmental Health (SQGE) for benzo(a)pyrene (20 mg/kg for urban residential and public open space land use) were adopted as it is based on a similar methodology to that prescribed in Schedule B5b of the ASC NEPM 2013 (i.e., based on the species sensitivity distribution approach).

8.4 MANAGEMENT LIMITS

In accordance with Section 2.9 of the ASC NEPM (NEPC, 2013), consideration of management limits applicable to a public open space / recreational land use setting has been undertaken to assess whether the reported soil conditions have the potential to pose a potential risk to buried infrastructure, or the formation of non-aqueous phase liquid (NAPL). The management limits were selected considering a fine soil type.

8.5 AESTHETIC CONSIDERATIONS

The following characteristics are considered indicative of soil materials that may have the potential to present unacceptable aesthetic impacts:

- Surface soil materials that exhibit heavy staining or emit hydrocarbon odours that are perceptible within 2 m of the soil investigation area; and
- Anthropogenic wastes in near-surface soil material onsite.

8.6 DESCISION RULES

The following decision rules were adopted for this assessment when comparing results against site assessment criteria:

- If the concentrations of COPC detected were below the adopted soil assessment criteria, the potential risk to human health, buried infrastructure, and the environment at that location could be considered to be low.
- If concentrations of COPC were greater than the adopted assessment criteria, consideration for statistical analysis of the dataset should be carried out to support the need or otherwise for further assessment, management or remediation. If the 95% upper confidence limit (UCL) of the mean contaminant concentration being less than the adopted site assessment criteria, the standard deviation being less than 50% and no individual concentration being above 250% of the site assessment criteria (for similar soil types) then the risk to human health and the environment at that location could be considered to be low. Statistical appraisal does not apply to asbestos and may not apply to TRH management limits in some circumstances.

9. QUALITY ASSURANCE/ QUALITY CONTROL

A summary of Coffey's quality assurance assessment is discussed below.

9.1 FIELD QUALITY CONTROL (QC) PROCEDURES

Sampling was conducted by an environmental scientist from Coffey who was considered to be competent in the identification of ACM in soil and conducting investigations to assess contamination. Field investigations were completed in general accordance with Coffey's SOP's, which are based on relevant regulatory guidelines and Australian standards.

Samples were placed in clean, laboratory supplied ziplock bags, and where required in eskies (for convenience of transportation) and transported to the laboratory with 'chain of custody' documentation.

No non-conformances were noted during the sample collection, handling and transportation.

9.2 FIELD QUALITY CONTROL (QC) SAMPLES AND RESULTS

To measure the accuracy and precision of the data generated by the field and laboratory procedures for this assessment, Coffey collected and analysed field quality control samples comprising duplicates, a rinsate blank sample, a trip blank sample and a trip spike sample.

Field duplicate soil samples were collected from soil immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into two (2) sample jars. Relative percentage differences (RPDs) were calculated. Acceptable limits for %RPDs were:

- 50% where the average concentration is <10 times the laboratory limit of reporting (LOR).
- 30% where the average concentration is >10 times the laboratory LOR.
- RPDs have only been considered where a concentration is greater than 1 times the LOR.

One intra-laboratory duplicate sample DUP-1 and one inter-laboratory duplicate (triplicate) sample (TRIP-1) were collected with primary sample BH4_0.8-0.9., Review of relative percent differential (RPDs) results indicated that the RPDs of analytes were generally within acceptable ranges. In general, the comparison of primary and duplicate samples demonstrated good reproducibility, with the exception of selected metals, PAHs and TRHs, RPDs were within acceptable limits. Based on field observations the RPD exceedances were attributed to heterogeneity of the historical fill. Both the primary and duplicate results have been considered in this assessment to account for the variability.

Concentrations for all analytes within the Trip Blank sample were below the laboratory LOR which indicated that cross contamination was unlikely to have occurred during sample storage and transport.

The Trip Spike analyte recovery was within acceptable range (70 – 130%) with concentrations of the higher volatility compounds (BTEX and C_6-C_{10}) reported between 70% and 100% of the initial spiked concentration, indicating minimal losses of volatile components occurred during sample transport.

Rinsate sample (Rinsate) reported concentrations of COPCs below the LOR, which indicates that the decontamination procedures were acceptable and it is, therefore, considered that there is a low potential for cross-contamination to have impacted on the laboratory results.

A review of the analytical reports indicates that:

- The samples were chilled and correctly preserved.
- Appropriate sample containers were used.
- Samples were received within the recommended holding times.
- Results were NATA endorsed.
- Internal laboratory quality control procedures were within acceptable ranges.

In summary, the field and laboratory data are representative of the conditions of the sampling locations at the time of sampling and the data is considered to be directly usable for the objective of the works.

Calculated RPDs have been presented in Table 2, Appendix F.

10. RESULTS

10.1 SUBSURFACE CONDITIONS

In summary the following visual observations were made in completing the assessment:

- The subsurface lithology was generally described as a layer of topsoil / fill material (between 0.4m and 1.6m thick), underlain by residual clays and sandstone bedrock.
- Topsoil fill material was present at the surface at each location and was generally described as a mixture of brown – dark brown, sandy silty clay / sand, medium plasticity, medium to coarse grained sand with root fibres, some clay nodules, trace fragments of siltstone and sandstone, blue metal (BH04) and ironstone (BH07).
- Fill material, generally underlaid the topsoil, and was described as a mixture of grey to - dark brown - orange, sandy silty clay, sandy clay, sand and gravelly silty clay, fine to coarse grained, low to medium plasticity was coarse grained, sandstone gravel and red ironstone was also encountered. Anthropogenic materials including fabric, bitumen fragments, blue metal, slag[5], terracotta tiles and PVC fragments were also noted.
- Suspected ACM was not observed within the boreholes; however, a fragment of suspected ACM was identified on surface fill within the southern portion of the site, with surface fill containing slag or coke and brick fragments. This fragment was collected for laboratory analysis (FC_01) which confirmed it contained asbestos.
- Refusal in fill material was encountered at a depth of 0.5m bgl in BH02. Refusal on hard sandstone was encountered in BH07 (0.25 mbgl) and BH08 (0.3m bgl).
- Natural residual clay soils were encountered at borehole locations BH01 (1.6m bgl), BH03 (0.4m bgl), BH04 (0.8m bgl), BH05 (0.5m bgl) and BH06 (0.4m bgl). These residual clays were described as high plasticity brow-orange clay with some red mottling.
- A strong odour was noted in BH07 at a depth of 0.2m, slag[5] fragments were also noted within fill material at this location.
- Possible hydrocarbon staining was noted within fill material at a depth of approximately 0.8m in BH01, PID readings were recorded at 1.2 ppm, which is not indicative of significant volatile compounds.
- PID readings ranged from 0.1 ppm to 2.4 ppm, indicating low likelihood of volatile compounds to be present.
- The two samples (GS_1 and GS_2) collected from beneath the basement level were described as brown, fine grained, sandy fill material overlying weathered sandstone bedrock.

Borehole logs are provided in Appendix E and calibration certificates are provided for the PID in Appendix G.

10.2 ANALYTICAL RESULTS

Sampling locations are shown on Figure 3, and the results are summarised in the following section and tabulated in Table 1, Appendix F.

A total of 11 primary soil samples (3 topsoil samples, 7 fill samples, and 1 natural soil sample), one duplicate and one triplicate and one fragment of suspected ACM were submitted for laboratory analysis. A review of the analytical results indicated the following:

- Asbestos was confirmed to be present within the fragment fibre cement sheeting collected from the surface fill (sample FC_01).
- Concentrations of COPCs were below the laboratory LOR and/or the adopted site criteria, with the exception of the following:

[5] Its possible that the slag observed could have been coke which is similar in appearance.

- The NEPM (2013) ESL for TRH F2 C10- C16 (120 mg/kg) and TRH F3 C16-C34 (300 mg/kg) were exceeded in soil sample BH7_0.15-0.25 at concentrations of 340 mg/kg and 3,070 mg/kg, respectively.
- The NEPM (2013) Management limits for residential, parkland and public open space for TRH F3 C16-C34 (2,500 mg/kg) was exceeded in sample BH7_0.15-0.25 (3,070 mg/kg).
- The Canadian SQEG ESL for Benzo(a)pyrene (20 mg/kg) was exceeded in sample BH7_0.15-0.25 (27.7 mg/kg).
- The NEPM (2013) HIL-C for benzo(a)pyrene TEQ (3 mg/kg) was exceeded in samples BH2_0.2-0.3 (4.5 mg/kg) and BH7_0.15-0.25 (38.2 mg/kg). The NEPM (2013) HIL-C for total PAHs was exceeded in sample BH7_0.15-0.25 (506 mg/kg).

A review of the data for fill samples indicated that:

- The elevated concentration of **TRH F2 (F2 C10 - C16 minus naphthalene)** in sample **BH7_0.15-0.25** was **a statistical outlier** given that all other samples reported concentrations of F2 less than the laboratory LOR (<50mg/kg).
- The elevated concentrations of **TRH F3 (C16 - C34)**, **benzo(a)pyrene, benzo(a)pyrene TEQ, and Total PAHs** in sample **BH7_0.15-0.25** were also **statistical outliers.** Concentrations of TRH F3 and BaP in this sample were also greater than 250% of the assessment criteria.

As per the decision rules outlined within Section 8.6, statistical appraisal of the benzo(a)pyrene TEQ (BaP TEQ) sample population was carried out. The 95% UCL of the arithmetic mean contaminant concentrations were calculated using the software 'ProUCL'. Where results were recorded below the laboratory LOR, a value equal to the PQL was adopted. The 95% UCL was not considered for TRH (F2 and F3), benzo(a)pyrene, or total PAHs as the concentrations reported in sample BH7_0.15-0.25 were greater than 250% of the adopted assessment criteria and/or were considered to be statistical outliers.

Prior to calculating the 95% UCL of the arithmetic mean, outlier tests were performed using ProUCL to remove localised elevated values which could skew the 95% UCL value. A copy of the 95% UCL and outlier test results are provided in Appendix J, and the results are summarised in Table 9-1.

Table 9-1: Output of statistical evaluation of the BaP TEQ sample population

Analyte	Outlier Test		95% UCL					
	No. Samples^	Outliers	No. Samples	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Standard Deviation	Assessment Criteria (mg/kg)	95% UCL
BaP TEQ	14	1 (BH7_0.15-0.25)	13 (outlier removed from dataset)	0.6	4.2	1.01	3	1.553

^ No of samples comprised fill and topsoil and included duplicate results to account for heterogeneity of the material.

The results for the statistical appraisal for **BaP TEQ** confirmed that:

- One outlier is present within the sample population at 5% significant level – 38.2 mg/kg (sample BH7_0.15-0.25).
- When the outlier is removed from the sample population:
  - The standard deviation value is less than 50% of the adopted assessment criteria.
  - The maximum concentration value is less than the adopted assessment criteria.
  - The 95% UCL concentration value is less than the adopted assessment criteria.

Exceedances are shown on Figure 4, Appendix A.

10.3 ASBESTOS CLEARANCE CERTIFICATE

Council provided Coffey with a copy of the following asbestos clearance certificate:

- ADE Consulting Group (ADE), 2024, Asbestos Materials Clearance Inspection Report, Middle Head Oval Pavilion, Mosman NSW, prepared for Mosman Municipal Council, report reference: A301022.0173.W02, CLR1.V1F, dated 7 May 2024.

This asbestos clearance certificate covered an area of approximately 10 meters, south of the Amenities building, adjacent to the water hydrant system, targeting an area of gravel where the asbestos was identified (FC_01) by Coffey. This area was denoted as the 'subject area' by ADE.

ADE stated that that:

- Non-friable (bonded) asbestos cement debris within gravelly fill of soil surface was removed from the 'subject area' by a SafeWork NSW Class A licensed asbestos removal company on the 3rd of May 2024.
- The inspection, undertaken by an occupational hygienist from ADE on 3rd May 2024 following the removal works, revealed no visible or accessible asbestos remaining within the subject area at the time of inspection.
- The non-friable (bonded) asbestos cement debris was removed from the subject area to a satisfactory standard.
- The ACM was disposed of at a licensed asbestos waste-receiving facility.

It is noted that this clearance certificate relates only to the surface of the area inspected (i.e., the 'subject area') at the time of inspection, and does not include the subsurface material, areas covered by grass or adjacent areas to the subject area.

A copy of the asbestos clearance certificate is provided in Appendix K.

11. DISCUSSION OF RESULTS

Based on visual observations, review of soil analytical results and a statistical appraisal of the laboratory data for chemical exceedances, Coffey considers that:

- Fill at the site in the vicinity of BH7 is impacted with TRH and PAHs, likely as a result of imported uncontrolled fill (AEC3) including possible coke:
  - TRH (F2 and F3 fractions) impacted fill at BH7 may pose an unacceptable risk to ecological receptors without appropriate remediation / management.
  - TRH (F3) impacted fill at BH7 is unlikely to pose unacceptable risks to buried infrastructure or form NAPL given that it is likely associated with coke.
  - PAHs (as carcinogenic PAHs, measured as benzo(a)pyrene TEQ) and total PAHs) may pose unacceptable risks to human health from direct contact without appropriate remediation / management.
  - Given the heterogeneity of the fill encountered, the lateral extent of impact is not well defined. Further investigation in this area may provide greater confidence on the extent and volume of TRH and PAH impacted soil requiring remediation / management.
- Anthropogenic materials including fabric, bitumen fragments, blue metal, slag/coke, terracotta tiles and PVC fragments were observed throughout the fill. These materials may not be considered suitable for placement within garden/soft landscaped areas of the proposed development, and as such may require off-site disposal or on-site management.
- Asbestos may pose unacceptable risks to human health from inhalation if disturbed. The source of the ACM identified in the southern portion of the site is unknown however may be associated with the current/previous structures (AEC1) or uncontrolled fill (AEC3). The removal of bonded ACM from the surface during sampling (FC-01) and during the asbestos clearance certificate (ADE, 2024), reduces the potential risks to current and future site users, noting that the clearance certificate only relates to the area

inspected at the time of inspection, and weathering of the surface soils may potentially uncover more asbestos, if it is within the deeper fill material.

- Given the limitations and findings of this investigation, Coffey considers that there is the potential for further ACM impacts to present within fill material, particularly within the fill mound observed within the eastern portion of the site given:
  - The heterogeneity of the fill observed which included construction / demolition type material; and
  - Boreholes were used for sampling which are less conducive than other investigation methods such as test pits, in supporting detailed observations of inclusions in fill such as ACM.
- OCPs were not reported above the laboratory LOR in the four (4) samples analysed. Coffey considers that contamination from the potential use of pesticides (AEC2) at the site is unlikely/negligible.
- PFAS were detected in four (4) samples of fill however concentrations were less than the adopted assessment criteria. Coffey considers that PFAS contamination from uncontrolled fill (AEC3) or from potential migration of PFAS in surface runoff from the adjacent HMAS Penguin site is unlikely/negligible.

The potential for groundwater to be impacted with chemicals of concern associated with impacted fill at the site is considered to be low given that groundwater was not encountered during the fieldwork to the depth of bedrock, the anticipated depth to groundwater (i.e. greater than 10mbgl within bedrock), the leachability of TRHs and PAHs from soils impacted by coke are anticipated to be low, and the extent of impact is likely relatively localised in the general vicinity of borehole BH7. Additionally, no beneficial uses of groundwater have been identified. As such further assessment of groundwater is not considered to be warranted at this stage. Further leachability assessment may be carried out to provide additional confidence, if required.

12. CONCLUSIONS AND RECOMMENDATIONS

The site is currently being used for recreational purposes associated with the adjoining Middle Head Oval, and comprises a club room and grassed public open space area, with spectator seating. The site is proposed to be redeveloped with demolition of the existing building and construction of upgraded facilities and landscaping proposed.

Historical records indicate the site was used as a car park for the adjacent HMAS Penguin periodically between the 1960s and early 1980s. with the current club house building constructed between 1982 and 1986 and has remained relatively unchanged since.

The site has not been listed on any public registers in relation to contamination. HMAS Penguin, immediately west is part of the Department of Defence's 3 Year RCIP, and is listed as containing known contamination. Information regarding the type and extent of this contamination was not available on public records.

Review of available records, and observations made during a site walkover has identified the following potential contamination sources and AECs within the site:

- Potential for hazardous building materials to be present within the existing site structures.
- Historical and current use of pesticides at localised areas across the site.
- Potential for imported fill material of unknown origin and quality.
- Potential for onsite migration of PFAS contamination in surface runoff from adjacent HMAS Penguin.

A limited soil investigation was undertaken which included soil sampling from 8 hand augered boreholes, collected of two surface soils from beneath the existing site building and analysis of one ACM fragment. The results of this limited soil investigation identified the following in relation to soil contamination at the site:

- The subsurface lithology was described as a of topsoil, overlying a sandy / clayey fill material (between 0.4m to 1.6m thick), underlain by residual clays and sandstone bedrock. Inert foreign material was observed within the fill, which may not be deemed to be acceptable from an aesthetic perspective within garden/soft landscaped areas as part of the final design for the proposed redevelopment, however, could be managed during redevelopment.
- Asbestos in the form of a fibre cement sheet fragment was identified on the ground surface by Coffey within the southern portion of the site, which was removed as a sample during the fieldwork. An Asbestos Materials Clearance Inspection was undertaken by ADE on 3rd May 2024 which indicates that additional fragments of ACM were subsequently removed from the ground surface within this area by a SafeWork NSW Class A licensed asbestos removal company. Given the limitations and findings of this investigation, there is some uncertainty regarding whether ACM impacts may be more widespread within fill (beneath the surface). Asbestos if present and disturbed may pose a potential risk to future site users. ACM impacted soil, if present, could be remediated / managed as part of the redevelopment.
- Exceedances of TRH and PAHs above the adopted ecological and human health criteria (applicable to public open space land uses) were reported in fill material in borehole BH7, likely associated with the importation of uncontrolled fill including possible coke. The identified TRH and PAH impacted soil may pose unacceptable risks to human health and the environment during re-development and future use without remediation / management. Given the heterogeneity of the fill encountered, the lateral extent of impact is not well defined; further investigation in this area may provide greater confidence on the extent and volume of TRH and PAH impacted soil requiring remediation / management.
- The potential for groundwater to be impacted with COPC associated with impacted fill at the site is considered to be low given that groundwater was not encountered during the fieldwork to the depth of bedrock, the anticipated depth to groundwater (i.e. greater than 10mbgl within bedrock), the leachability of TRHs and PAHs from soil impacted with coke are anticipated to be low, and the extent of impact is expected to be relatively localised in the general vicinity of borehole BH7. Additionally, no beneficial uses of groundwater have been identified. As such further assessment of groundwater is not considered to be warranted at this stage. Further leachability assessment may be carried out to provide additional confidence, if required.

Based on the above, Coffey considers that the site in its current state is not suitable for the proposed redevelopment however could be made suitable subject to further investigation and/or implementation of a strategy to remediate / manage the contamination encountered. Coffey makes the following recommendations:

- Additional investigation is carried out to:
  - Address the uncertainty regarding the presence, extent and potential risk of asbestos in soil at the site; and
  - Provide greater confidence on the extent and volume of TRH and PAH impacted soil in the vicinity of BH7 requiring remediation / management, if required.
- A Remedial Action Plan (RAP) is prepared to document remediation requirements during the redevelopment and ensure that the site can be made suitable for the intended public open space land use. Remediation and/or management could also deal with the inert foreign material observed frequently within the fill, which may not be deemed to be acceptable from an aesthetic perspective within garden/soft landscaped areas as part of the final design for the proposed redevelopment.

Furthermore, Council may wish to seek independent legal advice regarding the Duty to Notify contamination under the CLM Act.

13. LIMITATIONS

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY ENVIRONMENTAL REPORT

Introduction

This report has been prepared by Tetra Tech Coffey for you, as Tetra Tech Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Tetra Tech Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Tetra Tech Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Tetra Tech Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Tetra Tech Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Tetra Tech Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Tetra Tech Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Tetra Tech Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Tetra Tech Coffey prepared the report and has familiarity with the site, Tetra Tech Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Tetra Tech Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

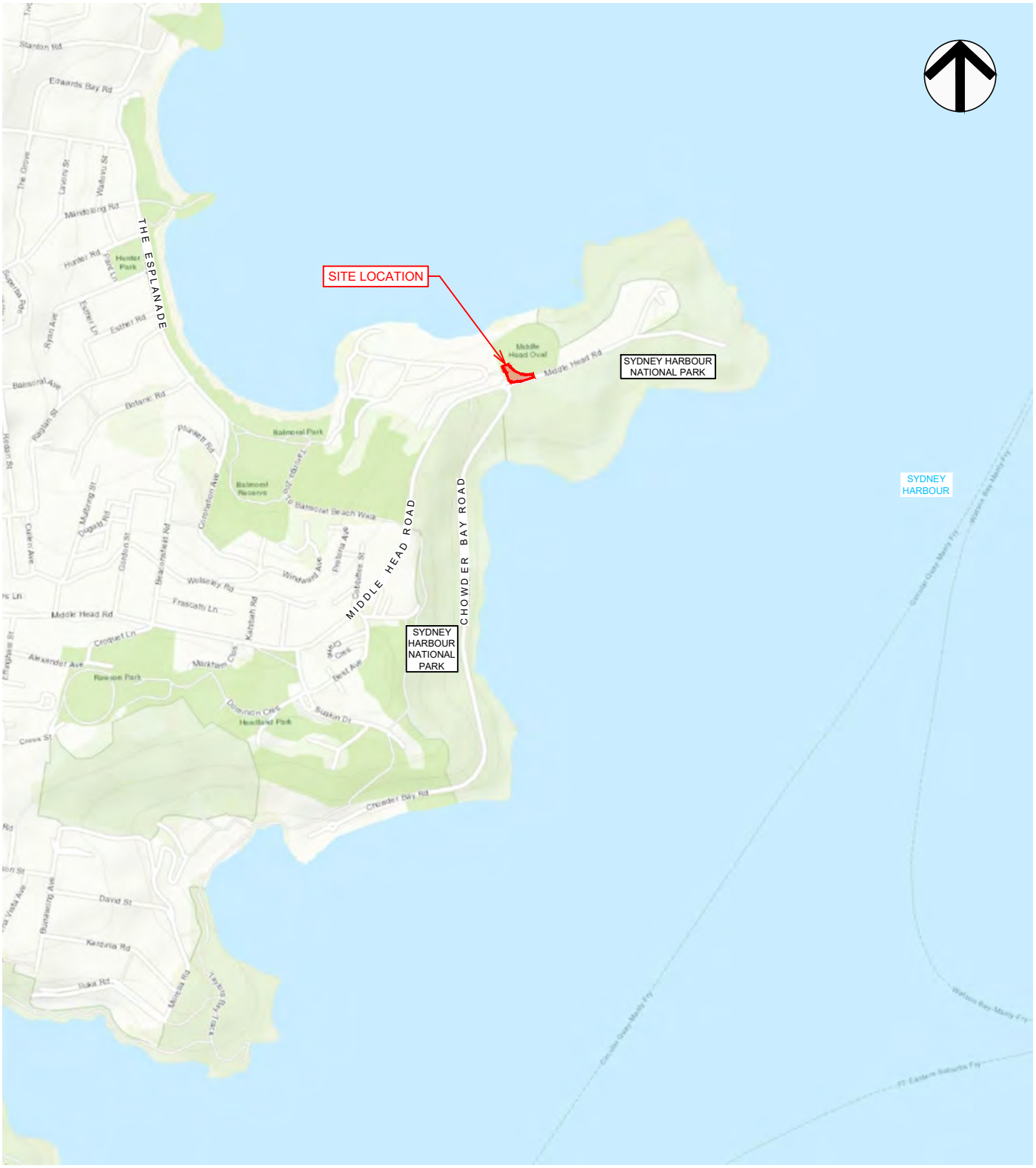
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

APPENDIX A: FIGURES



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Scale (metres) 1:15000

IMAGERY SOURCE: WORLD TOPOGRAPHIC MAP
SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

drawn	JS / DR
approved	-
date	23-04-2024
scale	AS SHOWN
original size	A4

TETRA TECH COFFEY

client: MOSMAN MUNICIPAL COUNCIL, C/O ARCHER OFFICE PTY LTD

project: PRELIMINARY SITE INVESTIGATION WITH LIMITED SAMPLING
1110 MIDDLE HEAD ROAD, MOSMAN, NSW

title: SITE LOCATION PLAN

project no: 754-SYDEN349808-R01 | figure no: FIGURE 1 | rev: A

PLOT DATE: 23/4/2024 2:19:45 PM DWG FILE: F:\1. PROJECTS\1. SYDENENV\2024\SYDEN349808_MOSMANCC_MIDDLE HEAD_SAR\12.CAD\754-SYDEN349808-R01.DWG

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

MAP PROJECTION: GDA2020 MGA ZONE 56

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Scale (metres) 1:400

drawn	JS / DR
approved	-
date	23-04-2024
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: MOSMAN MUNICIPAL COUNCIL, C/O ARCHER OFFICE PTY LTD

project: PRELIMINARY SITE INVESTIGATION WITH LIMITED SAMPLING
1110 MIDDLE HEAD ROAD, MOSMAN, NSW

title: SITE LAYOUT PLAN

project no: 754-SYDEN349808-R01 | figure no: FIGURE 2 | rev: A

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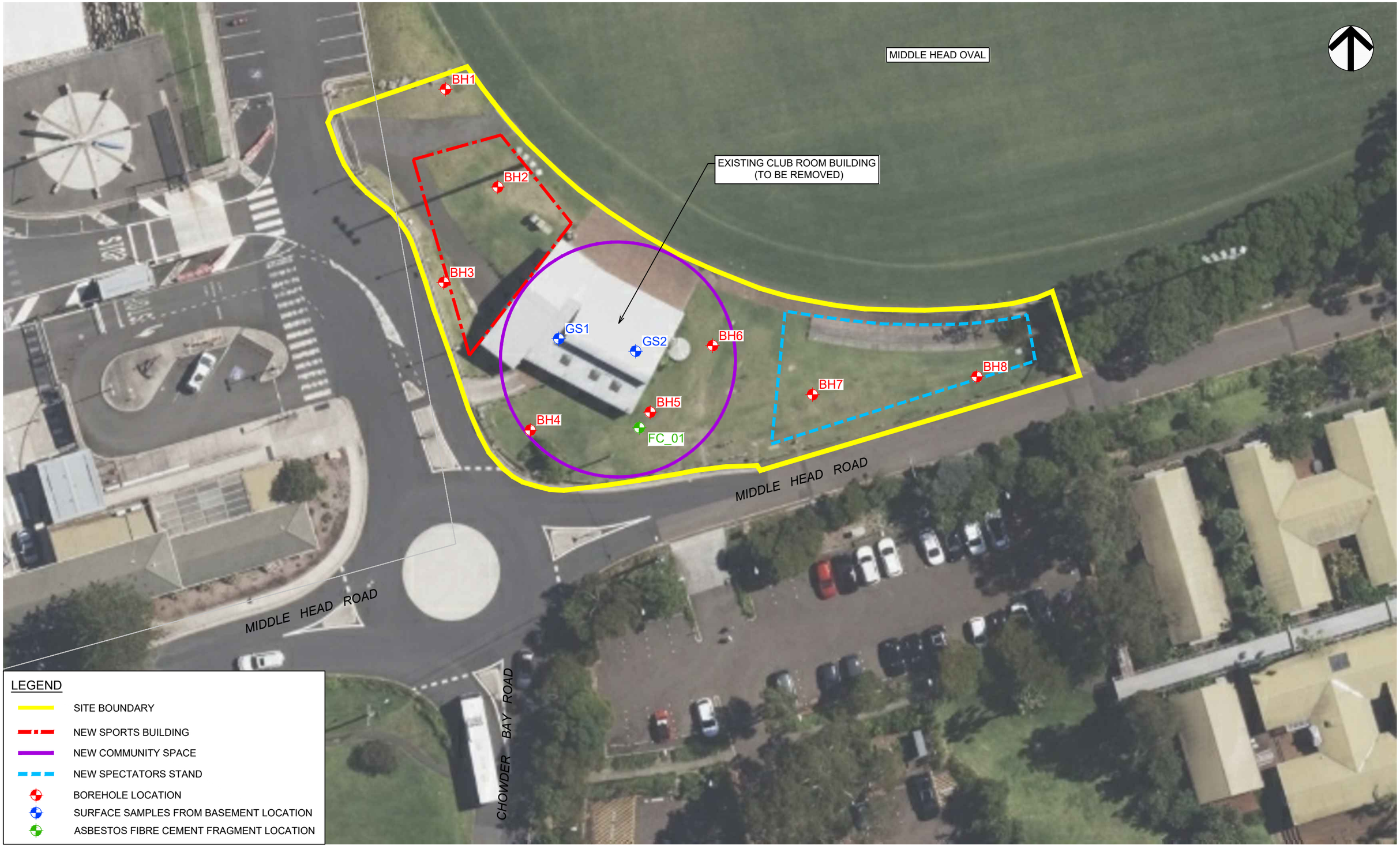

LEGEND

- SITE BOUNDARY
- NEW SPORTS BUILDING
- NEW COMMUNITY SPACE
- NEW SPECTATORS STAND
- BOREHOLE LOCATION
- SURFACE SAMPLES FROM BASEMENT LOCATION
- ASBESTOS FIBRE CEMENT FRAGMENT LOCATION

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

MAP PROJECTION: GDA2020 MGA ZONE 56

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Scale (metres) 1:400

drawn	JS / DR
approved	-
date	23-04-2024
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: MOSMAN MUNICIPAL COUNCIL, C/O ARCHER OFFICE PTY LTD

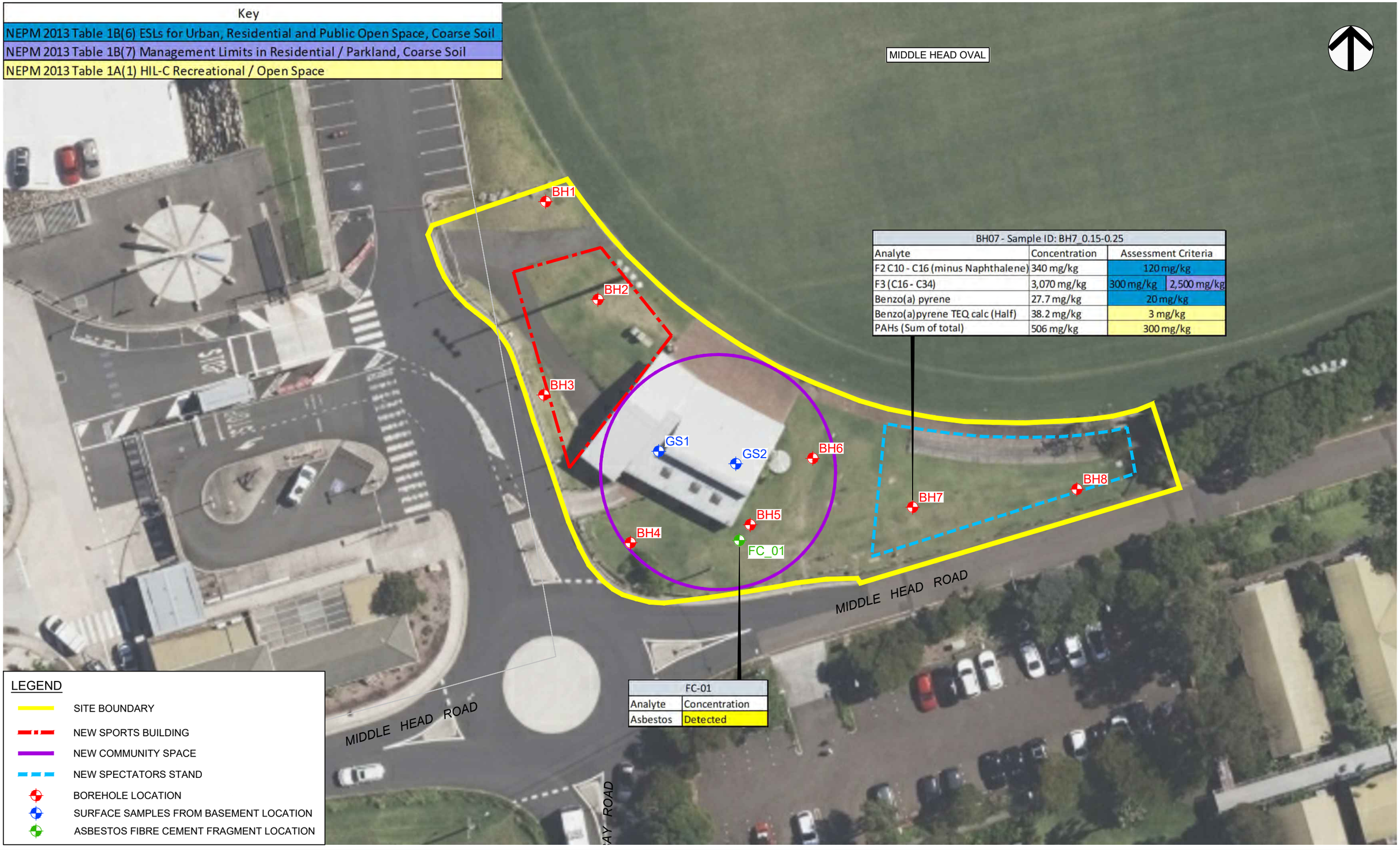
project: PRELIMINARY SITE INVESTIGATION WITH LIMITED SAMPLING
1110 MIDDLE HEAD ROAD, MOSMAN, NSW

title: SAMPLING LOCATION PLAN

project no: 754-SYDEN349808-R01 | figure no: FIGURE 3 | rev: A

PLOT DATE: 23/4/2024 2:19:11 PM DWG FILE: F:\1. PROJECTS\1. SYDENENV\2024\SYDEN\349808_MOSMANCC_MIDDLE HEAD_SAR\12.CAD\754-SYDEN349808-R01.DWG

Key
NEPM 2013 Table 1B(6) ESLs for Urban, Residential and Public Open Space, Coarse Soil
NEPM 2013 Table 1B(7) Management Limits in Residential / Parkland, Coarse Soil
NEPM 2013 Table 1A(1) HIL-C Recreational / Open Space



LEGEND

- SITE BOUNDARY
- NEW SPORTS BUILDING
- NEW COMMUNITY SPACE
- NEW SPECTATORS STAND
- BOREHOLE LOCATION
- SURFACE SAMPLES FROM BASEMENT LOCATION
- ASBESTOS FIBRE CEMENT FRAGMENT LOCATION

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

MAP PROJECTION: GDA2020 MGA ZONE 56

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Scale (metres) 1:400

drawn	JS / DR
approved	-
date	23-04-2024
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: MOSMAN MUNICIPAL COUNCIL, C/O ARCHER OFFICE PTY LTD

project: PRELIMINARY SITE INVESTIGATION WITH LIMITED SAMPLING
1110 MIDDLE HEAD ROAD, MOSMAN, NSW

title: SOIL EXCEEDANCE LOCATION

project no: 754-SYDEN349808-R01 | figure no: FIGURE 4 | rev: A

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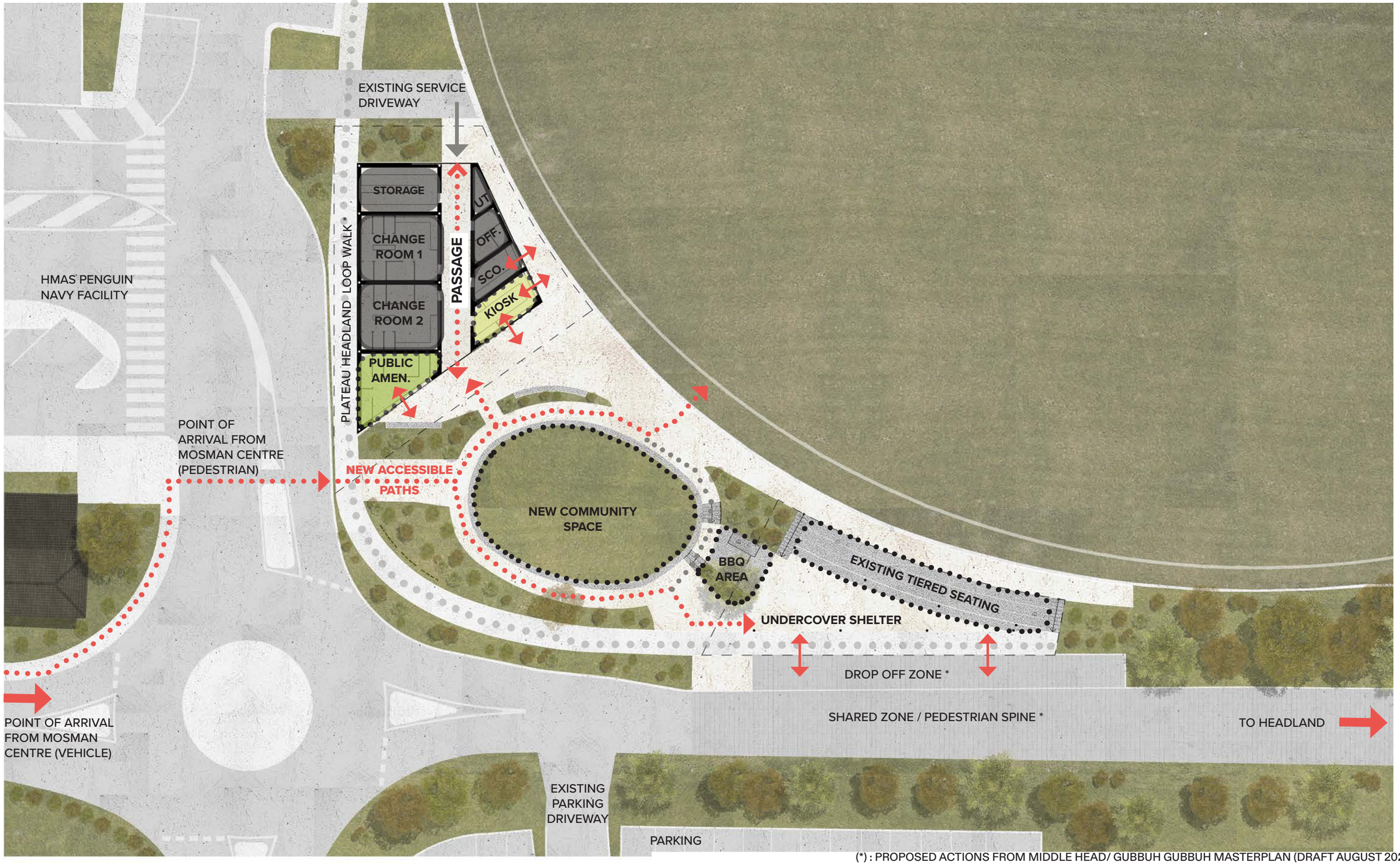
APPENDIX B: CONCEPT DESIGN PLANS

SITE PLAN

A PLACE FOR COMMUNITY AND SPORT



(*) : PROPOSED ACTIONS FROM MIDDLE HEAD/ GUBBUH GUBBUH MASTERPLAN (DRAFT AUGUST 2023)

APPENDIX C: PHOTOGRAPH LOG

Photo 1. 04.04.2024 Existing club house looking south east.

Photo 2. 04.04.2024 Existing club house and basement level, looking south east.

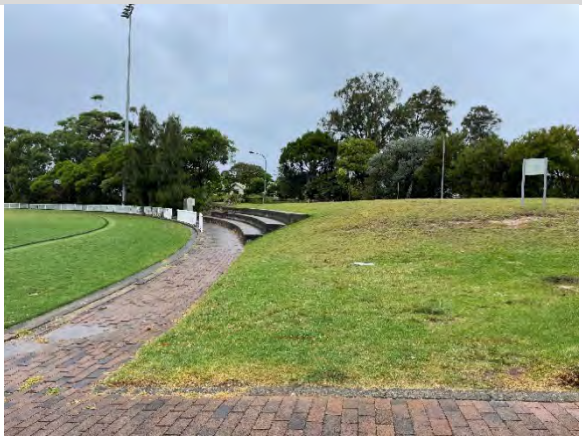


Photo 3. 04.04.2024 Eastern portion of the site including the concrete spectator seats and grassed area, looking east.

Photo 4. 04.04.2024 Rainwater tank on eastern site of club house building.

Photo 5. 04.04.2024 Southern portion of the site showing sloping topography and exposed soils, looking south west.

Photo 6. 04.04.2024 Close up of exposed soils along southern portion of the site.

Photo 7. Area of gravelly fill where ACM was observed

Photo 8. Close-up of asbestos containing material – sample FC-1

Photo 9. Looking west across the site showing concrete spectator stand and vicinity to the Oval

Photo 10. Looking east, showing the eastern portion of the site and changed in elevation.

Photo 11. Exposed natural rock with some sandy fill material beneath existing building basement.

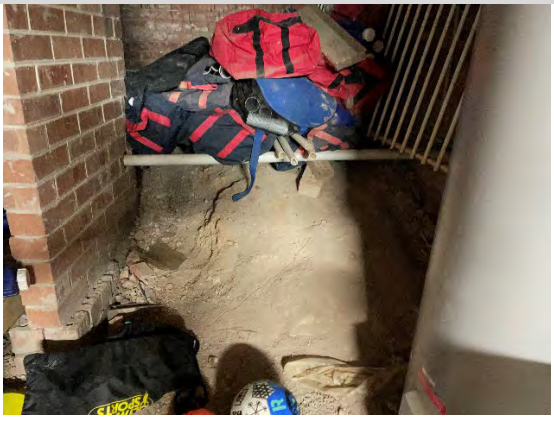


Photo 12. Exposed natural rock outcrop beneath existing building basement.

Photo 13. Storage area in basement of existing building.

Photo 14. Fill material encountered at borehole BH1.

Photo 15. Deeper fill material encountered at borehole BH1

Photo 16. Natural residual soils encountered at borehole BH1.

APPENDIX D: LOTSEARCH REPORT

LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 03 Apr 2024 14:51:31

Reference: LS054567 EP

Address: 1110 Middle Head Road, Mosman, NSW 2088

Dataset Listing

Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Customer Service - Spatial Services	04/01/2024	04/01/2024	Quarterly	-	-	-	-
Topographic Data	NSW Department of Customer Service - Spatial Services	22/08/2022	22/08/2022	Annually	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	29/02/2024	09/02/2024	Monthly	1000m	0	0	0
Contaminated Land Records of Notice	Environment Protection Authority	26/02/2024	26/02/2024	Monthly	1000m	0	0	0
Former Gasworks	Environment Protection Authority	24/01/2024	14/07/2021	Quarterly	1000m	0	0	0
Notices under the POEO Act 1997	Environment Protection Authority	17/01/2024	17/01/2024	Monthly	1000m	0	0	0
National Waste Management Facilities Database	Geoscience Australia	26/05/2022	07/03/2017	Annually	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	20/09/2023	07/09/2020	Annually	1000m	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	04/03/2024	21/11/2032	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Department of Defence	06/03/2024	06/03/2024	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Department of Defence	06/03/2024	06/03/2024	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	06/03/2024	06/03/2024	Monthly	2000m	0	0	0
Defence Controlled Areas	Department of Defence	12/01/2024	12/01/2024	Quarterly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	24/01/2024	02/09/2022	Quarterly	2000m	1	1	3
National Unexploded Ordnance (UXO)	Department of Defence	12/01/2024	12/01/2024	Quarterly	2000m	0	0	2
EPA Other Sites with Contamination Issues	Environment Protection Authority	13/11/2023	15/12/2022	Annually	1000m	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	04/03/2024	04/03/2024	Monthly	1000m	0	0	0
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority	04/03/2024	04/03/2024	Monthly	1000m	0	0	0
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	04/03/2024	04/03/2024	Monthly	1000m	0	0	3
UBD Business Directories (Premise & Intersection Matches)	Hardie Grant			Not required	100m	0	0	0
UBD Business Directories (Road & Area Matches)	Hardie Grant			Not required	100m	-	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	250m	0	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	250m	-	0	0
Points of Interest	NSW Department of Customer Service - Spatial Services	13/11/2023	13/11/2023	Quarterly	1000m	0	1	38
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	13/11/2023	13/11/2023	Quarterly	1000m	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	13/11/2023	13/11/2023	Quarterly	1000m	0	0	0
Major Easements	NSW Department of Customer Service - Spatial Services	31/01/2024	31/01/2024	Quarterly	1000m	0	1	3
State Forest	Forestry Corporation of NSW	12/12/2023	11/12/2023	Annually	1000m	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	16/02/2023	31/12/2022	Annually	1000m	0	1	1
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	06/02/2024	19/08/2019	Annually	1000m	0	0	1

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018	NSW Department of Planning, Industry and Environment	09/05/2023	23/02/2018	Annually	1000m	0	0	0
National Groundwater Information System (NGIS) Boreholes	Bureau of Meteorology; Water NSW	18/04/2023	13/07/2022	Annually	2000m	0	0	6
NSW Seamless Geology Single Layer: Rock Units	Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	1	1	6
NSW Seamless Geology – Single Layer: Trendlines	Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	0	2	2
NSW Seamless Geology – Single Layer: Geological Boundaries and Faults	Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	0	0	0
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Annually	1000m	0	0	0
Atlas of Australian Soils	Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)	12/01/2024	17/02/2011	Annually	1000m	0	1	1
Soil Landscapes of Central and Eastern NSW	NSW Department of Planning, Industry and Environment	12/12/2023	27/07/2020	Annually	1000m	1	2	4
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Industry and Environment	02/02/2024	01/09/2023	Monthly	500m	0	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	12/01/2024	21/02/2013	Annually	1000m	0	1	3
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	Annually	1000m	0	0	0
Mining Subsidence Districts	NSW Department of Customer Service - Subsidence Advisory NSW	24/01/2024	24/01/2024	Quarterly	1000m	0	0	0
Current Mining Titles	NSW Department of Industry	06/03/2024	06/03/2024	Monthly	1000m	0	0	0
Mining Title Applications	NSW Department of Industry	06/03/2024	06/03/2024	Monthly	1000m	0	0	0
Historic Mining Titles	NSW Department of Industry	06/03/2024	06/03/2024	Monthly	1000m	9	9	11
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning, Industry and Environment	02/02/2024	08/09/2023	Monthly	1000m	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning, Industry and Environment	02/02/2024	19/01/2024	Monthly	1000m	2	3	24
Commonwealth Heritage List	Australian Government Department of the Agriculture, Water and the Environment	20/10/2023	13/04/2022	Annually	1000m	3	4	9
National Heritage List	Australian Government Department of the Agriculture, Water and the Environment	20/10/2023	13/04/2022	Annually	1000m	0	0	0
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	24/01/2024	24/11/2023	Quarterly	1000m	0	1	2
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Industry and Environment	02/02/2024	19/01/2024	Monthly	1000m	3	5	32
Bush Fire Prone Land	NSW Rural Fire Service	26/02/2024	20/11/2023	Monthly	1000m	1	2	3
NSW Native Vegetation Type Map	NSW Department of Planning and Environment	26/05/2023	12/12/2022	Quarterly	1000m	1	2	6
Ramsar Wetlands of Australia	Australian Government Department of Agriculture, Water and the Environment	09/05/2023	01/11/2022	Annually	1000m	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	28/10/2022	26/10/2022	Annually	1000m	0	0	1
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	28/10/2022	26/10/2022	Annually	1000m	0	0	1
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	29/11/2023	29/11/2023	Weekly	10000m	-	-	-

Site Diagram

1110 Middle Head Road, Mosman, NSW 2088

Legend

- Site Boundary
- Internal Parcel Boundaries

Total Area: 1847m²

Total Perimeter: 218m

Scale: 0 — 12.5 Meters — 25

Data Source Aerial Imagery: © Aerometrex Pty Ltd

Disclaimers:

Measurements are approximate only and may have been simplified or smaller lengths removed for readability.

Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 April 2024

Contaminated Land

1110 Middle Head Road, Mosman, NSW 2088

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist	Direction
N/A	No records in buffer								

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

Contaminated Land

1110 Middle Head Road, Mosman, NSW 2088

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority

Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority

Contaminated Land

1110 Middle Head Road, Mosman, NSW 2088

EPA Notices

Penalty Notices, s.91 & s.92 Clean up Notices and s.96 Prevention Notices within the dataset buffer:

Number	Type	Name	Address	Status	Issued Date	Act	Offence	Offence Date	Loc Conf	Dist	Dir
N/A	No records in buffer										

NSW EPA Notice Data Source: Environment Protection Authority

Waste Management & Liquid Fuel Facilities

1110 Middle Head Road, Mosman, NSW 2088

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist	Direction
N/A	No records in buffer											

National Liquid Fuel Facilities

National Liquid Fuel Facilties within the dataset buffer:

Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist	Direction
N/A	No records in buffer										

PFAS Investigation & Management Programs

1110 Middle Head Road, Mosman, NSW 2088

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Map ID	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority

Defence PFAS Investigation Program

Sites being investigated by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation Program Data Custodian: Department of Defence, Australian Government

Defence PFAS Management Program

Sites being managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

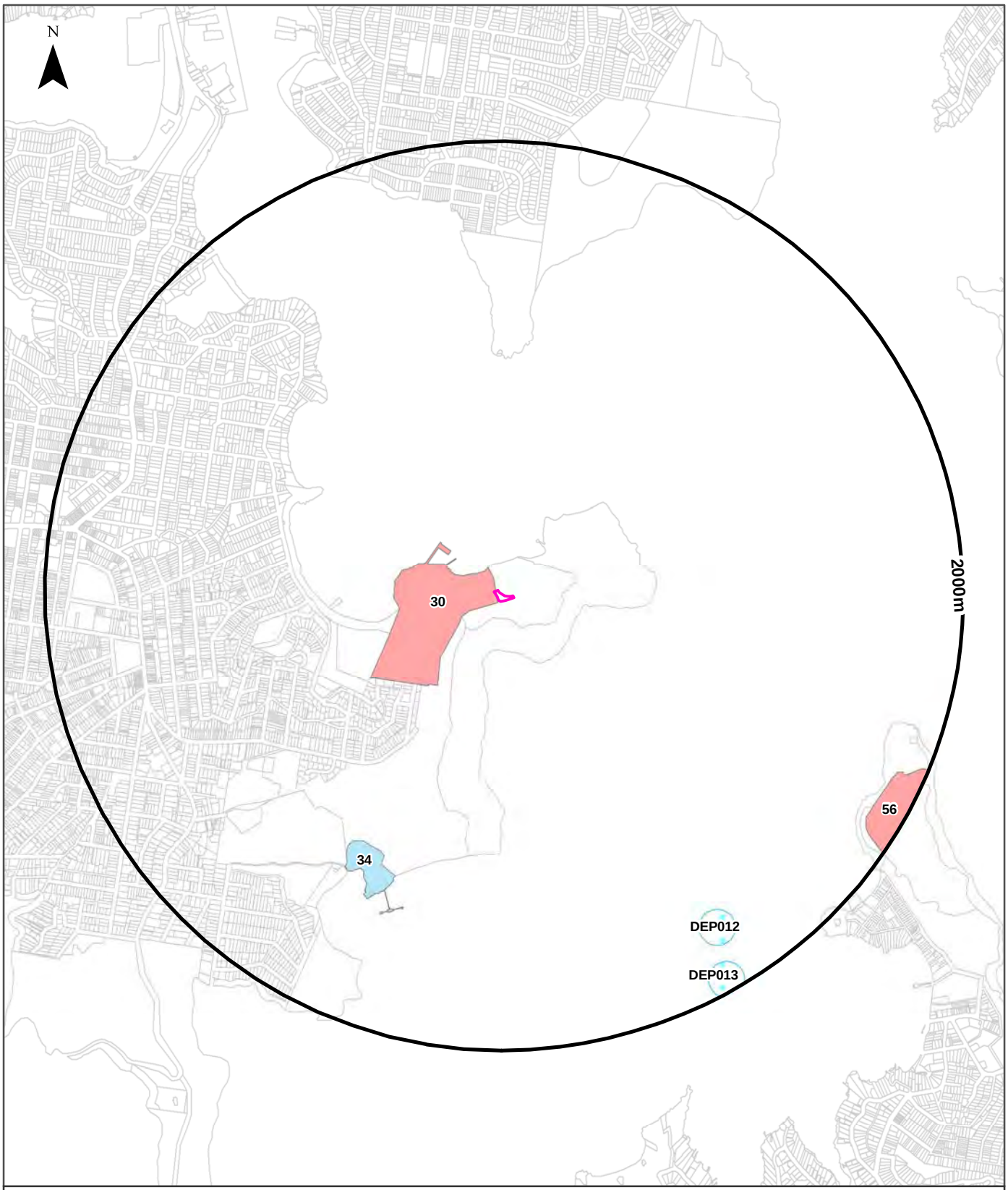
Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites and Unexploded Ordnance

1110 Middle Head Road, Mosman, NSW 2088



Legend

- Site Boundary
- Buffer 2000m
- Property Boundaries

DCA

- Defence Controlled Area

Defence 3 Year RCIP

- Known Contamination
- No Known Contamination

UXO

- Substantial Potential
- Slight Potential
- Remote Potential
- Sea Dumping of Depth Charges
- Information
- Other
- Other Sea Dumping Sites

Scale:	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2024	Coordinate System: GDA 1994 MGA Zone 56	Date: 03 April 2024

0 200 400 800 1,200 Meters

Defence Sites and Unexploded Ordnance

1110 Middle Head Road, Mosman, NSW 2088

Defence Controlled Areas (DCA)

Defence Controlled Areas provided by the Department of Defence within the dataset buffer:

Site ID	Location Name	Loc Conf	Dist	Dir
N/A	No records in buffer			

Defence Controlled Areas, Data Custodian: Department of Defence, Australian Government

Defence 3 Year Regional Contamination Investigation Program (RCIP)

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
30	HMAS Penguin	Balmoral, New South Wales	YES	Premise Match	0m	On-site
34	NFI Chowder Bay	Chowder Bay, New South Wales	NO	Premise Match	1230m	South West
56	HMAS Watson	Watsons Bay, New South Wales	YES	Premise Match	1844m	South East

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

National Unexploded Ordnance (UXO)

Sites which have been assessed by the Department of Defence for the potential presence of unexploded ordnance within the dataset buffer:

Site ID	Location Name	Category	Area Description	Additional Information	Commonwealth	Loc Conf	Dist	Dir
DEP012	Potential Depth Charge UXO - Port Jackson	Sea Dumping of Depth Charges	This site was an area where Depth Charges were used in WW2.		Not Commonwealth Land	As Supplied	1643m	South East
DEP013	Potential Depth Charge UXO - Port Jackson	Sea Dumping of Depth Charges	This site was an area where Depth Charges were used in WW2.		Not Commonwealth Land	As Supplied	1863m	South East

National Unexploded Ordnance (UXO), Data Custodian: Department of Defence, Australian Government

EPA Other Sites with Contamination Issues

1110 Middle Head Road, Mosman, NSW 2088

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority

EPA Activities

1110 Middle Head Road, Mosman, NSW 2088

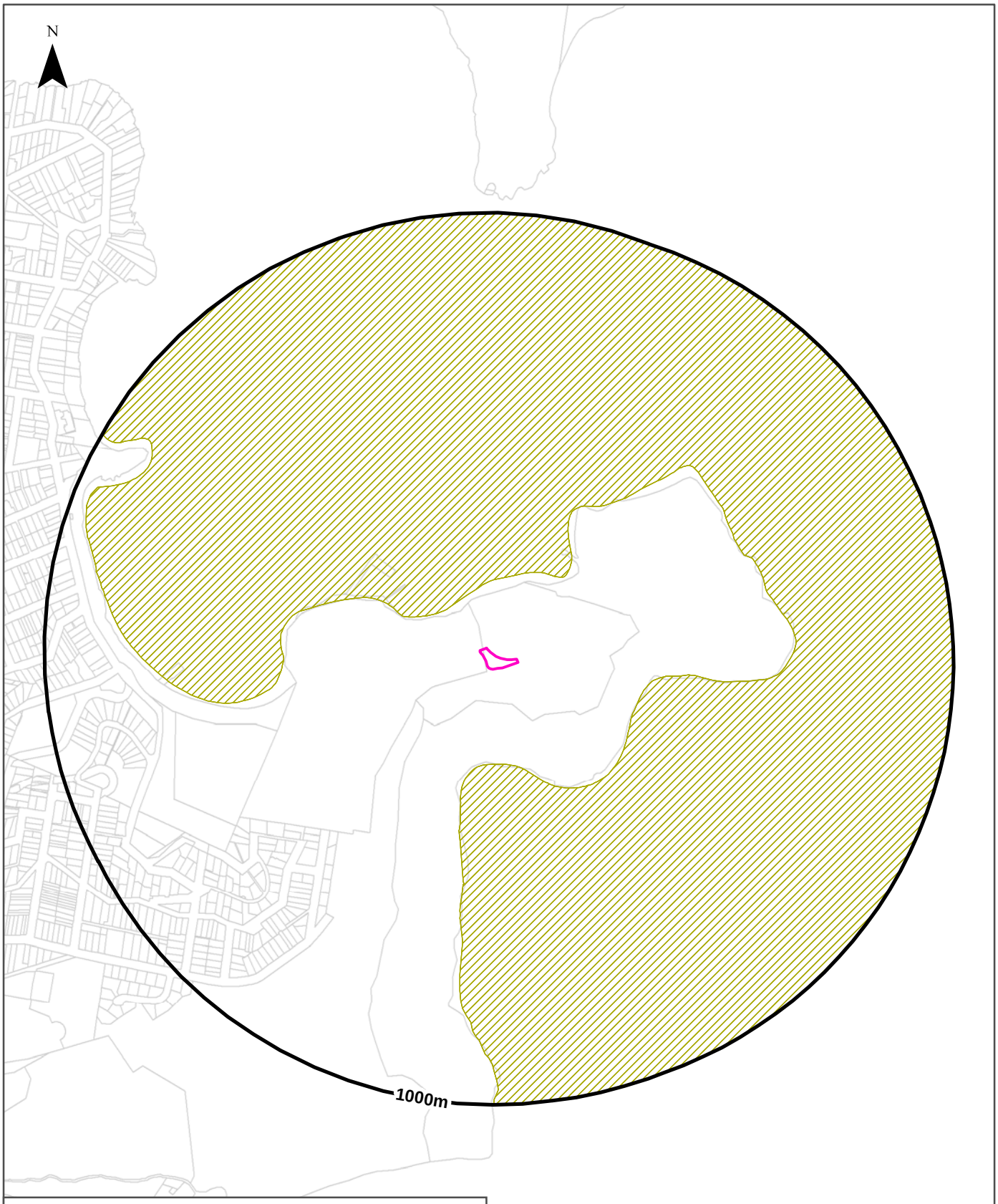
Licensed Activities under the POEO Act 1997

Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

Delicensed & Former Licensed EPA Activities

1110 Middle Head Road, Mosman, NSW 2088



Scale:	Property Boundary Data Source:	Coordinate System:	Date: 03 April 2024
0 100 200 400 600 Meters	© Department Finance, Services & Innovation 2024	GDA 1994 MGA Zone 56	

EPA Activities

1110 Middle Head Road, Mosman, NSW 2088

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

Delicensed Activities Data Source: Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	121m	North East
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered	07/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	121m	North East
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered	09/11/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	121m	North East

Former Licensed Activities Data Source: Environment Protection Authority

Historical Business Directories

1110 Middle Head Road, Mosman, NSW 2088

Business Directory Records 1950-1991
Premise or Road Intersection Matches

Potentially contaminative business activities extracted from Universal Business Directories from years 1991, 1986, 1982, 1978, 1975, 1970, 1965, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
N/A	No records in buffer						

Business Directory Records 1950-1991
Road or Area Matches

Potentially contaminative business activities extracted from Universal Business Directories from years 1991, 1986, 1982, 1978, 1975, 1970, 1965, 1961 & 1950, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer					

Historical Business Directories

1110 Middle Head Road, Mosman, NSW 2088

Dry Cleaners, Motor Garages & Service Stations 1948-1993 Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
N/A	No records in buffer						

Dry Cleaners, Motor Garages & Service Stations 1948-1993 Road or Area Matches

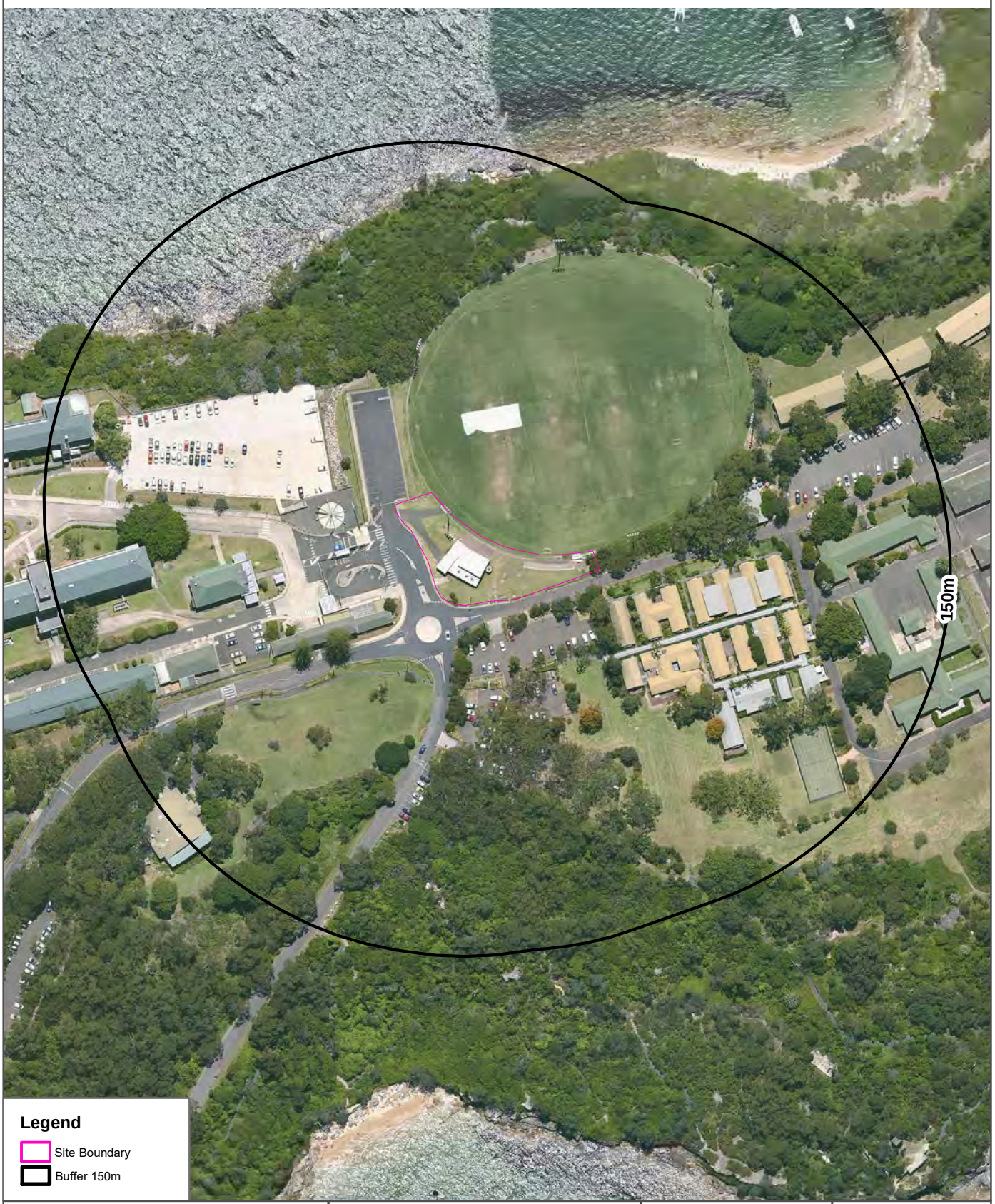
Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer					

Aerial Imagery 2023

1110 Middle Head Road, Mosman, NSW 2088



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© Aerometrex Pty Ltd	GDA 1994 MGA Zone 56	

Aerial Imagery 2020

1110 Middle Head Road, Mosman, NSW 2088

Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© Aerometrex Pty Ltd	GDA 1994 MGA Zone 56	

Aerial Imagery 2017

1110 Middle Head Road, Mosman, NSW 2088

Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© Aerometrex Pty Ltd	GDA 1994 MGA Zone 56	

Aerial Imagery 2014

1110 Middle Head Road, Mosman, NSW 2088

Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© Aerometrex Pty Ltd	GDA 1994 MGA Zone 56	

Aerial Imagery 2011

1110 Middle Head Road, Mosman, NSW 2088

Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© Aerometrex Pty Ltd	GDA 1994 MGA Zone 56	

Aerial Imagery 2007

1110 Middle Head Road, Mosman, NSW 2088

Scale:
0 25 50 75 100
Meters

Data Source Aerial Imagery:
© Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 03 April 2024

Aerial Imagery 2005

1110 Middle Head Road, Mosman, NSW 2088

Aerial Imagery 1994

1110 Middle Head Road, Mosman, NSW 2088

Scale:	Data Sources: Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

Aerial Imagery 1991

1110 Middle Head Road, Mosman, NSW 2088

Aerial Imagery 1986

1110 Middle Head Road, Mosman, NSW 2088

Aerial Imagery 1982

1110 Middle Head Road, Mosman, NSW 2088

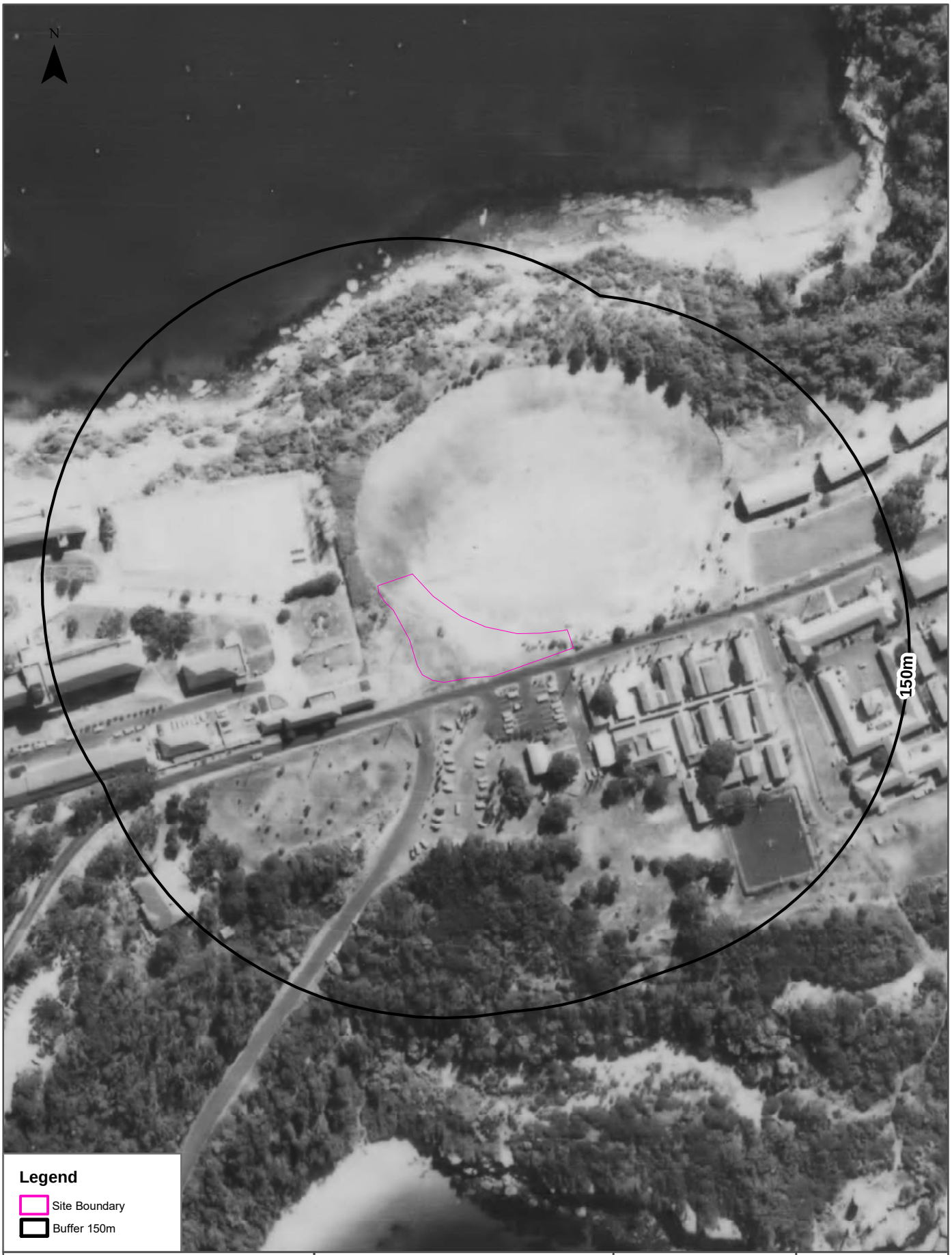
Aerial Imagery 1978

1110 Middle Head Road, Mosman, NSW 2088

Scale:	Data Sources: Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

Aerial Imagery 1970

1110 Middle Head Road, Mosman, NSW 2088



Scale: 0 25 50 75 100 Meters	Data Sources: Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 03 April 2024

Aerial Imagery 1965

1110 Middle Head Road, Mosman, NSW 2088

Scale:	Data Sources: Aerial Imagery:	Coordinate System:	Date: 03 April 2024
0 25 50 75 100 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

Aerial Imagery 1961

1110 Middle Head Road, Mosman, NSW 2088

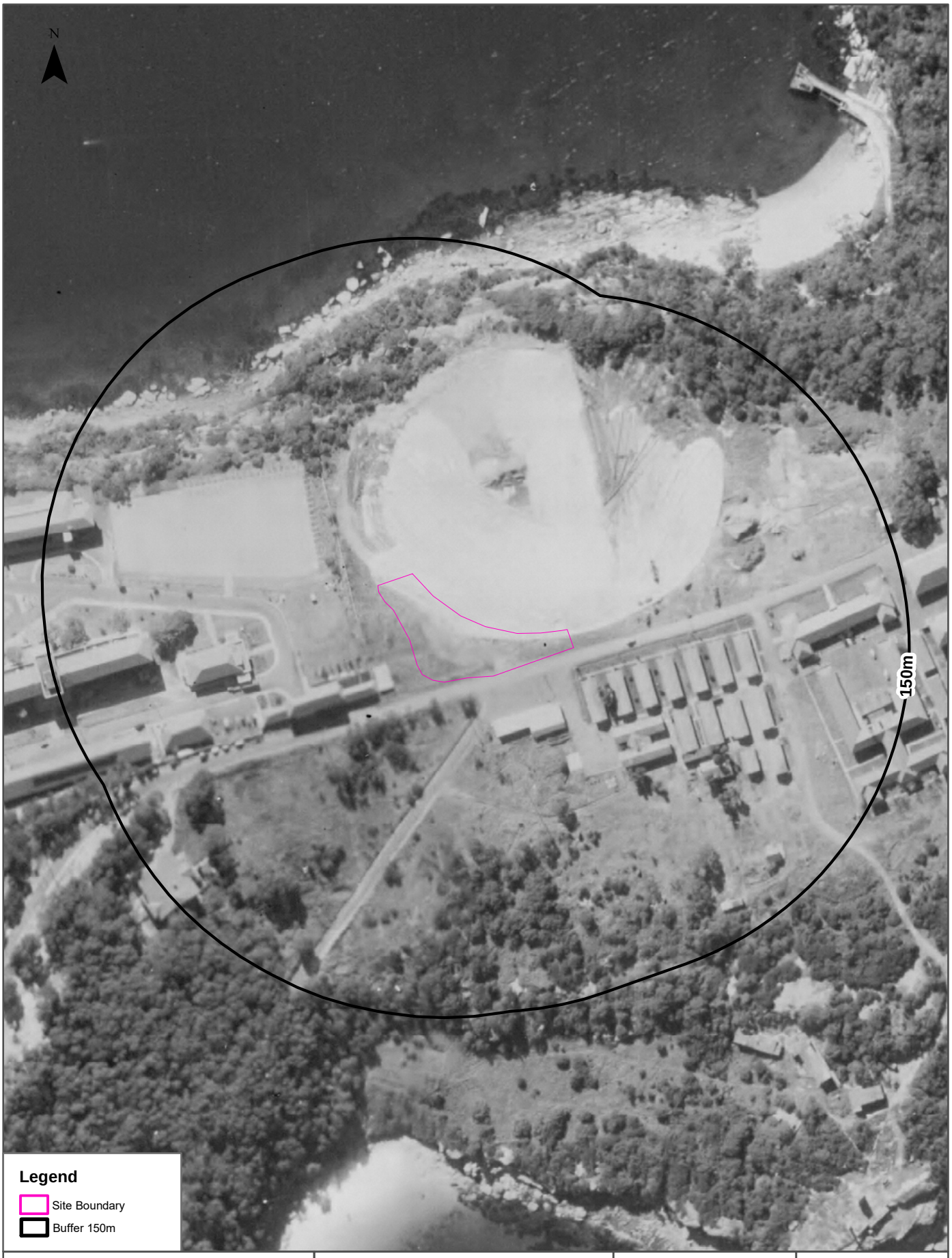
Aerial Imagery 1955, 1956

1110 Middle Head Road, Mosman, NSW 2088

Scale: 0 25 50 75 100 Meters	Data Sources: Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 03 April 2024

Aerial Imagery 1951

1110 Middle Head Road, Mosman, NSW 2088

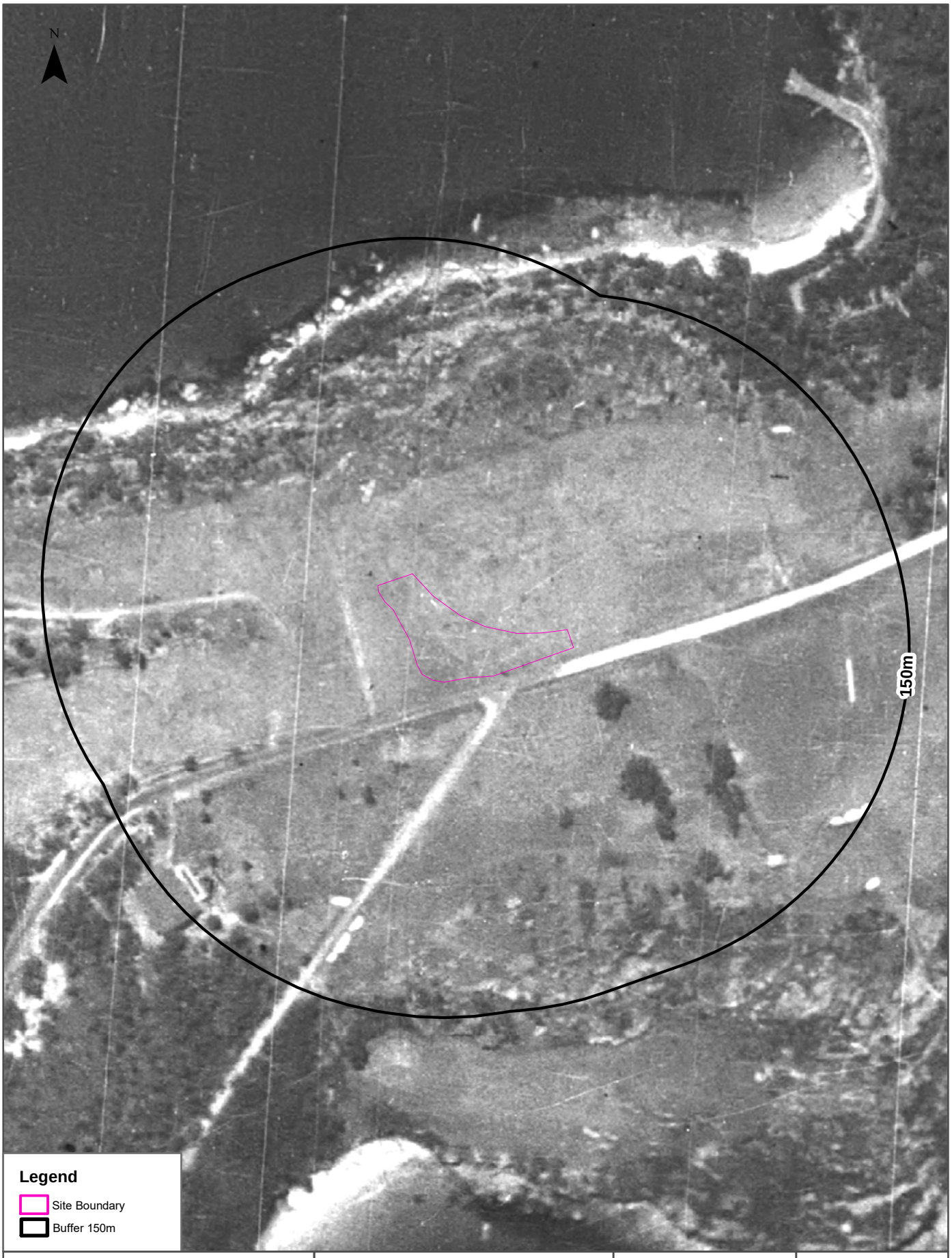


Aerial Imagery 1943

1110 Middle Head Road, Mosman, NSW 2088

Aerial Imagery 1930

1110 Middle Head Road, Mosman, NSW 2088



Topographic Map 2015

1110 Middle Head Road, Mosman, NSW 2088

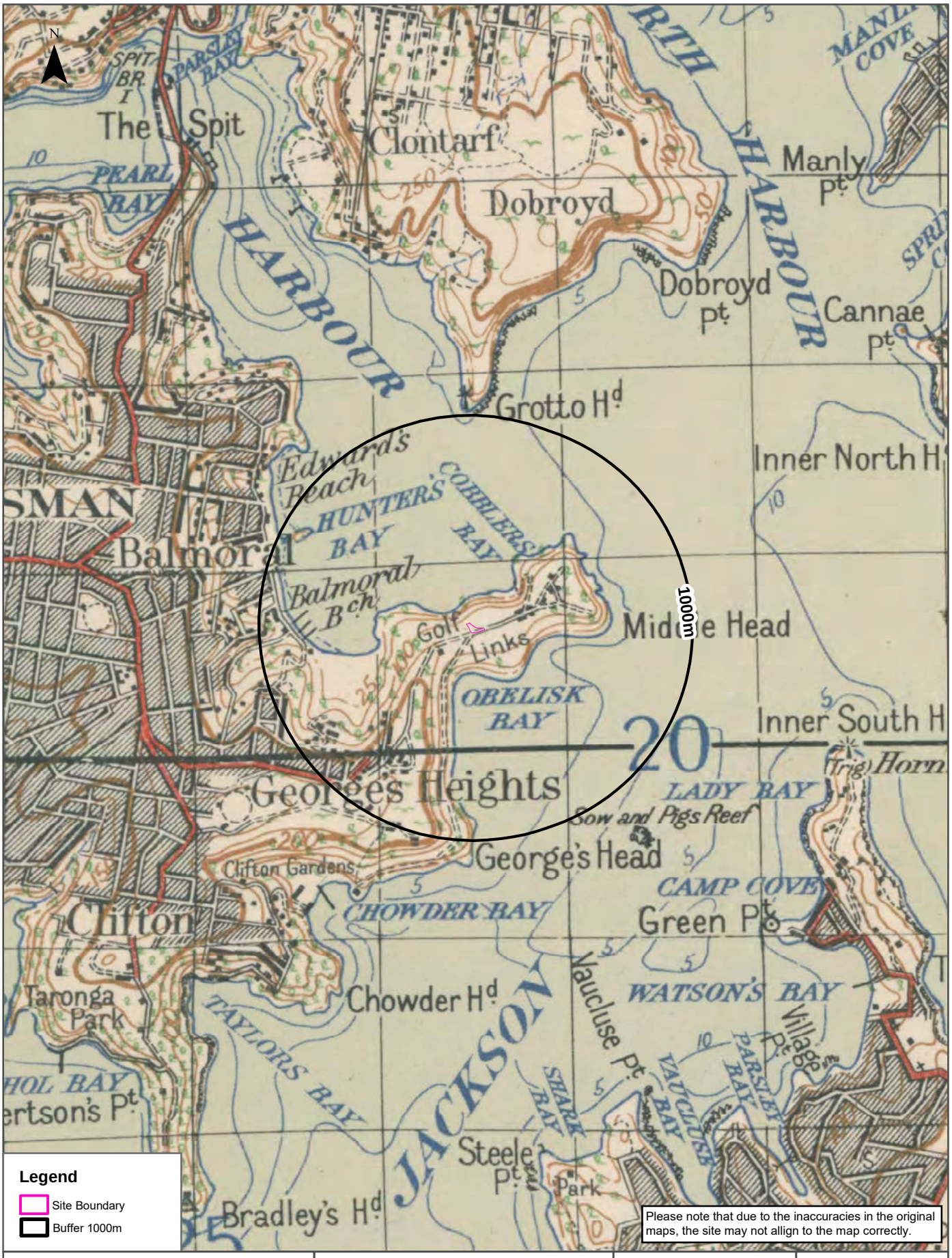
Scale: 0 140 280 420 560 Meters	Data Sources: Topographic Map Data © NSW Land and Property Information	Coordinate System: GDA 1994 MGA Zone 56	Date: 03 April 2024

Historical Map 1975

1110 Middle Head Road, Mosman, NSW 2088

Historical Map c.1936

1110 Middle Head Road, Mosman, NSW 2088



Scale: 0 290 580 870 1,160 Meters

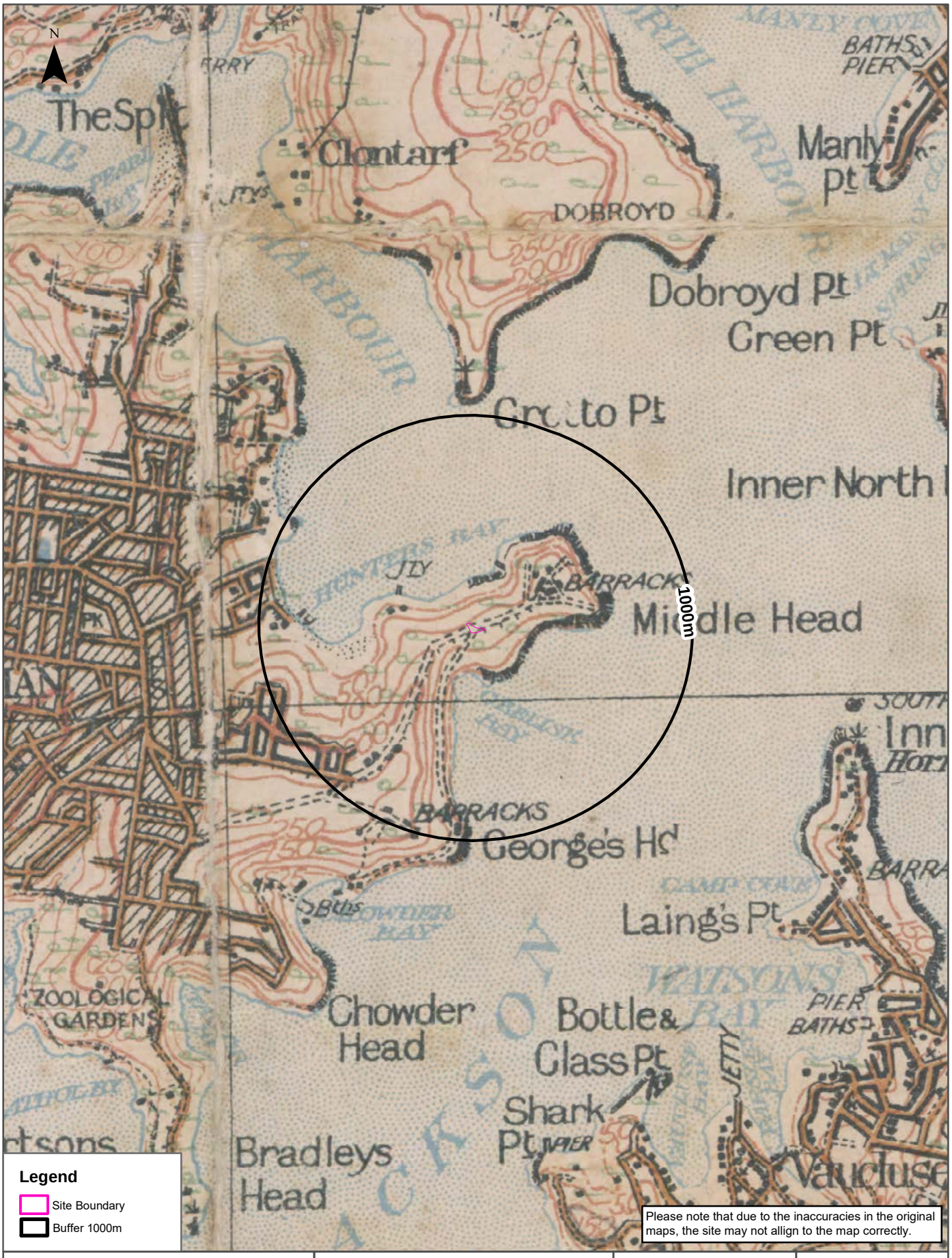
Data Sources: Australia 1:63360
Produced by Australian Section Imperial General Staff

Coordinate System:
GDA 1994 MGA Zone 56

Date: 03 April 2024

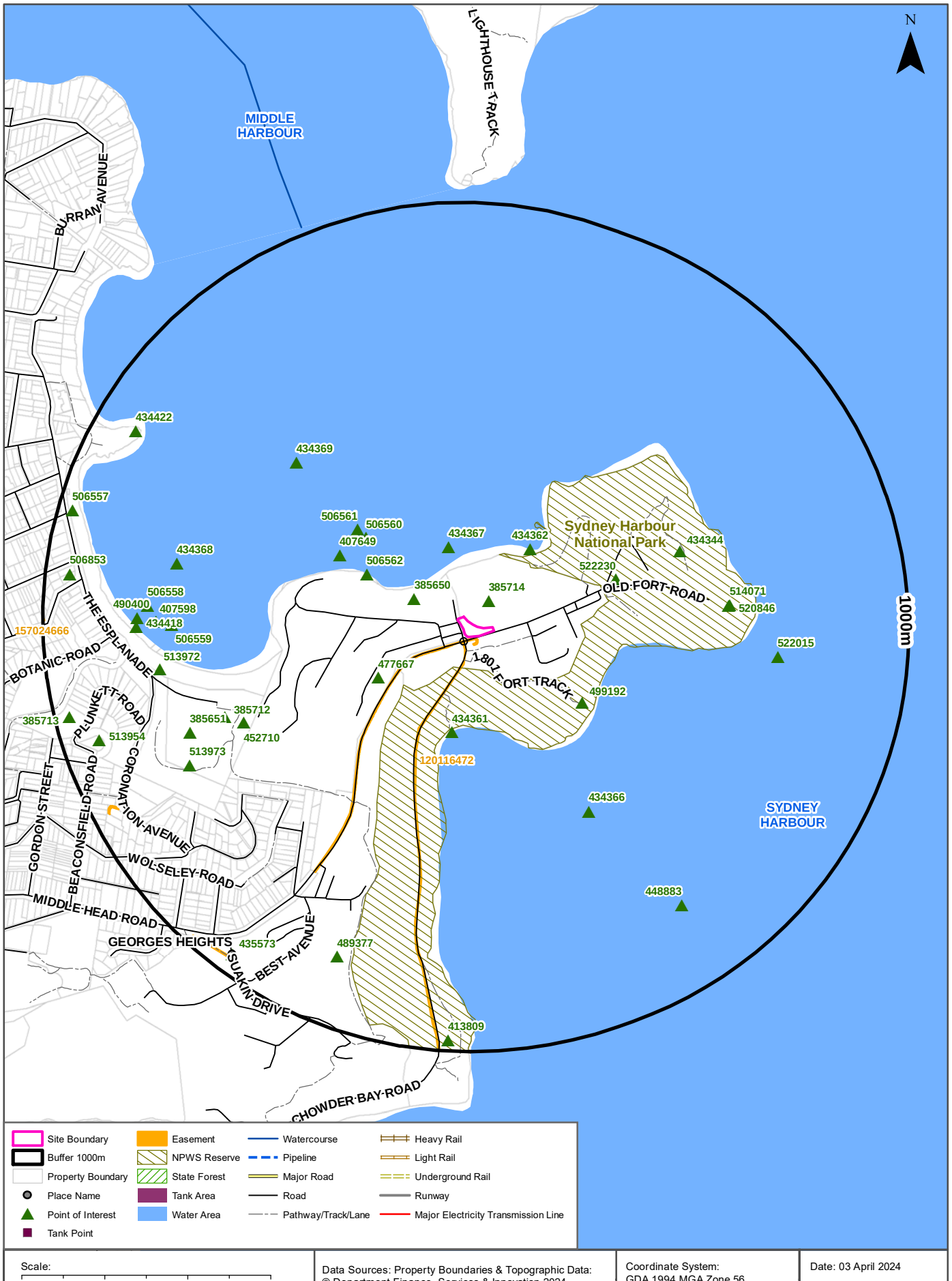
Historical Map c.1917

1110 Middle Head Road, Mosman, NSW 2088



Topographic Features

1110 Middle Head Road, Mosman, NSW 2088



Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2024

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 April 2024

Topographic Features

1110 Middle Head Road, Mosman, NSW 2088

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
385714	Sports Field	MIDDLE HEAD OVAL	65m	North East
385650	Park	COBBLERS BEACH RESERVE	115m	North West
434367	Bay / Inlet / Basin	COBBLERS BAY	173m	North
434362	Beach	COBBLERS BEACH	209m	North East
434361	Beach	OBELISK BEACH	233m	South
477667	General Hospital	BALMORAL NAVAL HOSPITAL	234m	South West
506562	Wharf	Wharf	244m	North West
499192	Historic Site	1801 FORT	274m	South East
506560	Wharf	Wharf	295m	North West
522230	Community Facility	NPWS GUBBUH GUBBUH / MIDDLE HEAD	319m	East
506561	Wharf	Wharf	323m	North West
407649	Wharf	Wharf	323m	North West
434344	Headland Like	MIDDLE HEAD / GUBBUH GUBBUH	487m	East
434366	Bay / Inlet / Basin	OBELISK BAY	492m	South East
434369	Bay Like	HUNTERS BAY	542m	North West
520846	Lookout	MIDDLE HEAD	569m	East
514071	Historic Site	MIDDLE HEAD FORTIFICATIONS	572m	East
452710	Community Facility	BALMORAL SEA SCOUT GROUP	572m	West
385712	Park	BALMORAL PARK	608m	West
522015	Ship Wreck	WRECK OF THE EDWARD LOMBE	687m	East
506559	Wharf	Wharf	689m	West
434368	Bay Like	BALMORAL BAY	690m	West
385651	Sports Field	BALMORAL OVAL	699m	West
407598	Swimming Pool	BATHS	727m	West
513972	Park	THE ESPLANADE	728m	West
513973	Sports Court	SKATE PARK	735m	South West
506558	Wharf	Wharf	748m	West
490400	Wharf	Wharf	772m	West
434418	Beach	BALMORAL BEACH	775m	West
448883	Lighthouse	WESTERN CHANNEL PILE LIGHTHOUSE	802m	South East
489377	Park	HEADLAND PARK	833m	South West

Map Id	Feature Type	Label	Distance	Direction
434422	Headland	ROCKY POINT	899m	North West
513954	Park	PLUNKETT PARK	911m	West
506853	High School	QUEENWOOD ART AND DESIGN CAMPUS	941m	West
435573	Urban Place	GEORGES HEIGHTS	953m	South West
506557	Picnic Area	Picnic Area	964m	West
385713	Park	LAWRY PLUNKETT RESERVE	965m	West
413809	Historic Site	GEORGES HEAD	973m	South

Topographic Features

1110 Middle Head Road, Mosman, NSW 2088

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
N/A	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
N/A	No records in buffer					

Major Easements

What Major Easements exist within the dataset buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120116472	Primary	Undefined		3m	South
150294424	Primary	Right of way	3.9	935m	South West
157024666	Primary	Right of way		996m	West

Topographic Features

1110 Middle Head Road, Mosman, NSW 2088

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

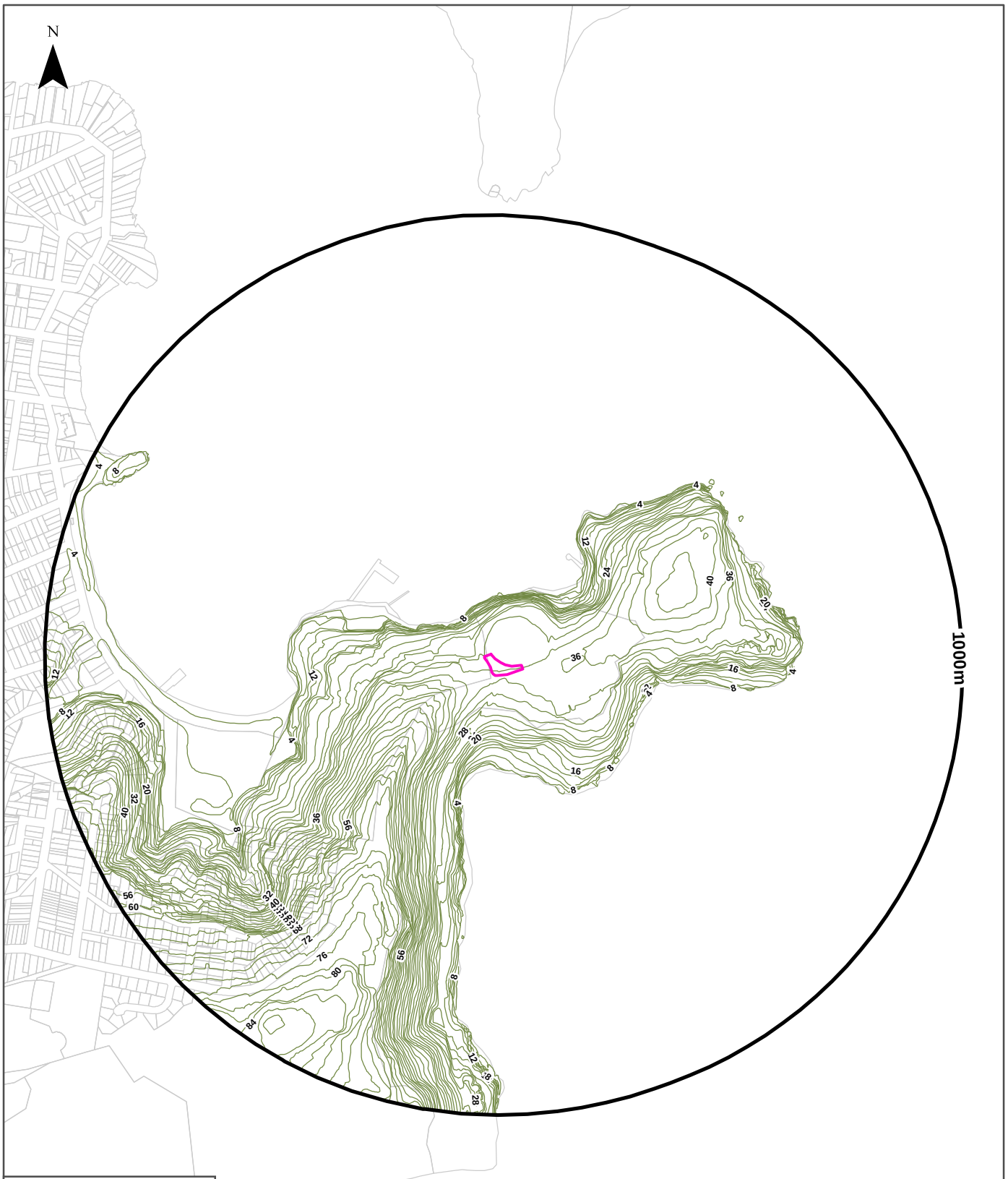
National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N0039	NATIONAL PARK	Sydney Harbour National Park	04/04/1975	77m	South East

Elevation Contours (m AHD)

1110 Middle Head Road, Mosman, NSW 2088



Legend

- Elevation Contour (m AHD)
- Site Boundary
- Buffer 1000m
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale:	Data Sources: Property Boundaries & Topographic Data:	Coordinate System:	Date: 03 April 2024
0 100 200 400 Meters	© Department Finance, Services & Innovation 2024	GDA 1994 MGA Zone 56	

Hydrogeology & Groundwater

1110 Middle Head Road, Mosman, NSW 2088

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Porous, extensive aquifers of low to moderate productivity	504m	West

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

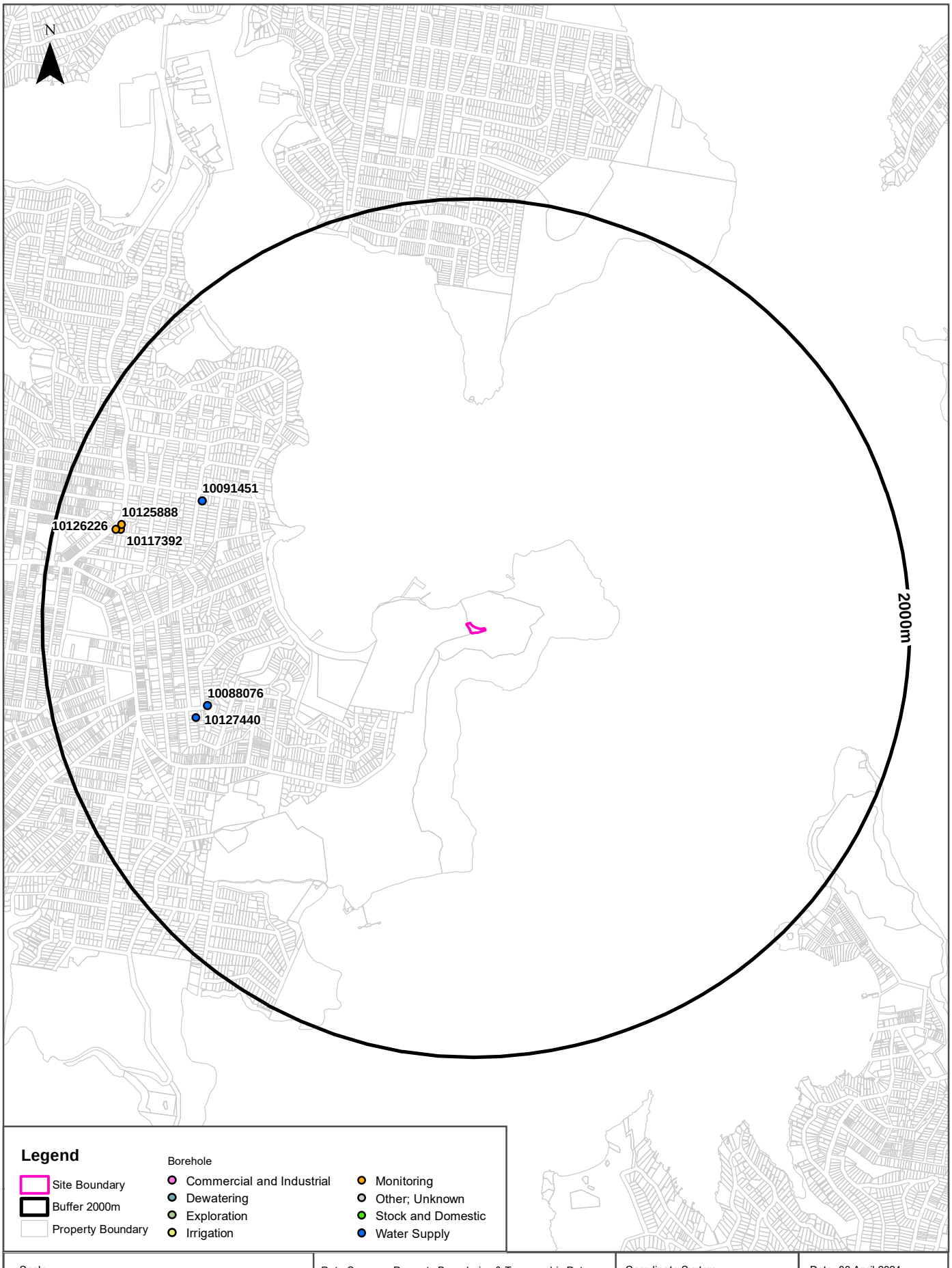
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

Prohibition Area No.	Prohibition	Distance	Direction
N/A	No records in buffer		

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries

Groundwater Boreholes

1110 Middle Head Road, Mosman, NSW 2088



Hydrogeology & Groundwater

1110 Middle Head Road, Mosman, NSW 2088

Groundwater Boreholes

Boreholes within the dataset buffer:

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Drill Date	Bore Depth (m)	Reference Elevation	Height Datum	Salinity (mg/L)	Yield (L/s)	SWL (mbgl)	Distance	Direction
10088076	GW108738	Water Supply	Functioning	26/04/2007	84.00		AHD	220	0.400	24.00	1280m	West
10127440	GW106880	Water Supply	Functioning	11/02/2005	107.90		AHD	220	0.200	37.80	1349m	West
10091451	GW108478	Water Supply	Functioning	24/01/2007	84.00		AHD	300	0.900	33.60	1374m	North West
10117392	GW114716	Monitoring	Functional	16/09/2010	2.40		AHD				1688m	West
10125888	GW114717	Monitoring	Functional	17/09/2010	3.00		AHD				1691m	West
10126226	GW114715	Monitoring	Functional	17/09/2010	3.00		AHD				1711m	West

Hydrogeology & Groundwater

1110 Middle Head Road, Mosman, NSW 2088

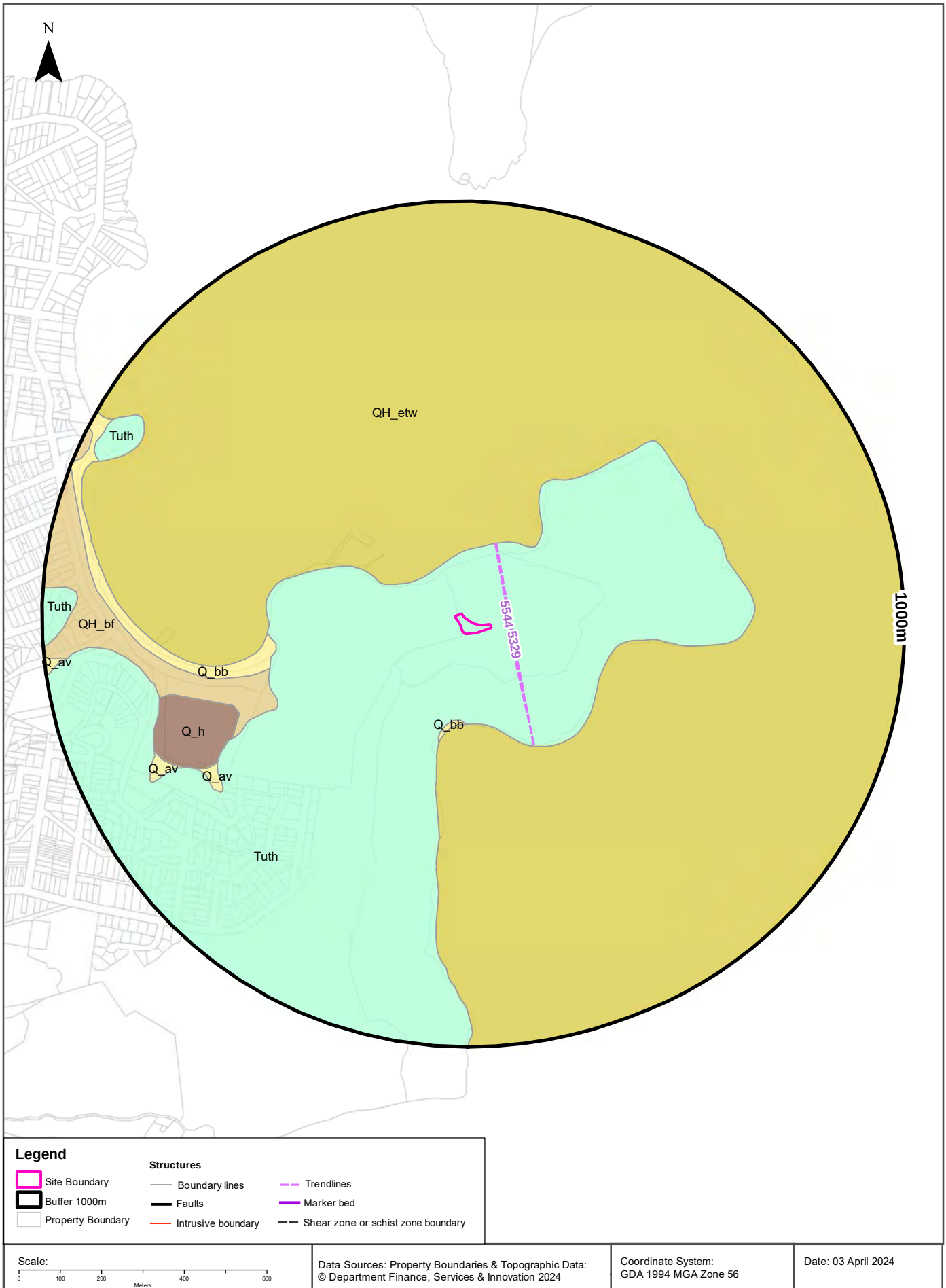
Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

NGIS Bore ID	Drillers Log	Distance	Direction
10088076	0.00m-0.80m clay, sandy 0.80m-24.00m sandstone, grey 24.00m-24.50m sandstone, fractured 24.50m-37.50m sandstone, grey 37.50m-38.00m shale 38.00m-47.00m sandstone, grey 47.00m-48.50m sandstone, quartz 48.50m-71.00m sandstone, grey 71.00m-73.00m sandstone, quartz 73.00m-76.00m sandstone, grey 76.00m-78.00m sandstone, quartz 78.00m-84.00m sandstone, grey	1280m	West
10127440	0.00m-0.70m Clay, brown 0.70m-6.70m Sandstone, grey 6.70m-6.80m Shale, black 6.80m-7.40m Shale, grey 7.40m-8.00m Sandstone, grey 8.00m-11.00m Sandstone, grey, water bearing 11.00m-13.50m Shale, light grey, very soft 13.50m-30.00m Sandstone, grey 30.00m-36.30m Sandstone, grey, coarse grained, water bearing 36.30m-38.00m Sandstone, light grey 38.00m-40.00m Sandstone, grey, fractured, water bearing 40.00m-43.00m Sandstone, grey 43.00m-44.50m Shale, brown grey 44.50m-59.50m Sandstone, grey 59.50m-59.70m Shale, grey 59.70m-60.40m Sandstone, grey 60.40m-60.80m Shale, light grey 60.80m-72.10m Sandstone, light grey 72.10m-72.60m Shale, brown (soft) 72.60m-107.90m Sandstone, grey/light grey	1349m	West
10091451	0.00m-2.00m Fill, rock 2.00m-6.00m Sandstone, yellow 6.00m-12.00m Sandstone, grey 12.00m-16.00m Sandstone, yellow 16.00m-31.00m Sandstone, grey 31.00m-32.00m Shale 32.00m-43.00m Sandstone, grey 43.00m-45.50m Sandstone-Quartz 45.50m-46.00m Clay 46.00m-51.00m Sandstone, grey 51.00m-52.00m Sandstone-Quartz, water bearing 52.00m-64.00m Sandstone, grey 64.00m-66.00m Sandstone-Quartz 66.00m-69.00m Sandstone, grey 69.00m-71.00m Siltstone-Quartz 71.00m-75.00m Sandstone, grey 75.00m-78.00m Sandstone-Quartz, water bearing 78.00m-84.00m Sandstone, grey	1374m	North West
10117392	0.00m-0.18m CONCRETE 0.18m-0.40m FILL,MOIST BROWN,LOOSE,SAND,GRAVEL 0.40m-0.60m FILL,DARK BROWN,DISTURBED NATURAL 0.60m-0.90m CLAY, SLIGHTLY MOIST,BROWN,FIRM,M/PLASTICITY 0.90m-1.40m SANDY CLAY PALE GREY WET 1.40m-2.40m CLAYEY SAND MOIST,GREY,MOTTLED ORANGE	1688m	West
10125888	0.00m-0.20m CONCRETE 0.20m-0.70m FILL MOIST,TAN BROWN,LOOSE,UNIFORM SAND,CLAY,GRAVEL,BRICK LAYER 0.70m-1.10m FILL DARK BROWN,SILT,SAND,GRAVEL 1.10m-4.00m SANDY CLAY VERY MOIST,PALE GREY,SOFT,LOW PLASTICITY	1691m	West
10126226	0.00m-0.20m CONCRETE 0.20m-0.50m FILL,MOIST,TAN BROWN,LOOSE,FINE SAND,SILT,SANDSTONE AND BRICK,GRAVELS 0.50m-1.20m SANDSTONE WEATHERED,TRACE GLASS AND ORGANIC MATTER RED TO BROWN 1.20m-2.30m SANDSTONE SLIGHTLY MOIST,WEATHERED HARD 2.30m-3.00m SANDY CLAY,MOIST,TAN BROWN,SOFT MED.PLASTICITY FINE SAND WET	1711m	West

Geology

1110 Middle Head Road, Mosman, NSW 2088



Geology

1110 Middle Head Road, Mosman, NSW 2088

Geological Units

What are the Geological Units within the dataset buffer?

Unit Code	Unit Name	Description	Unit Stratigraphy	Age	Dominant Lithology	Distance
Tuth	Hawkesbury Sandstone	Medium- to coarse-grained quartz sandstone with minor shale and laminite lenses.	\Ungrouped Triassic units\\Hawkesbury Sandstone\\	Anisian (base) to Anisian (top)	Sandstone	0m
QH_etw	Estuarine tidal delta flat (subaqueous)	Fine- to medium-grained lithic-carbonate-quartz sand (marine-deposited), silt, clay, shell material, polymictic gravel.	\Estuarine deposits\ \Estuarine tidal-delta flat \Estuarine tidal delta flat (subaqueous)\	Holocene (base) to Now (top)	Clastic sediment	121m
Q_bb	Coastal deposits - beach facies	Marine-deposited quartz-lithic fine- to medium-grained sand, shell and shell material, polymictic gravel.	\Coastal deposits\ \Coastal deposits - beach facies\\	Quaternary (base) to Now (top)	Sand	210m
QH_bf	Coastal deposits - backbarrier flat facies	Fine- to medium-grained quartz-lithic sand with carbonate and humic components (marine-deposited), indurated sand, silt, clay, gravel, organic mud, peat.	\Coastal deposits\ \Coastal deposits - backbarrier flat facies\\	Holocene (base) to Now (top)	Sand	465m
Q_h	Anthropogenic deposits	Anthropocene deposits varying from large man-made clasts (concrete blocks to building demolition rubble) to quarried natural boulders, with interstitial sand-sized to clay matrix.	\Anthropogenic deposits\ \\\	Quaternary (base) to Now (top)	Anthropogenic material	572m
Q_av	Alluvial valley deposits	Silt, clay, (fluvially deposited) lithic to quartz-lithic sand, gravel.	\Alluvium\\Alluvial valley deposits\\	Quaternary (base) to Now (top)	Clastic sediment	673m

Linear Geological Structures

What are the Dyke, Sill, Fracture, Lineament and Vein trendlines within the dataset buffer?

Map ID	Feature Description	Map Sheet Name	Distance
5544	Dyke or vein	Sydney 1:100,000 Geological Sheet	44m
5329	Dyke or vein	Sydney 1:100,000 Geological Sheet	48m

What are the Faults, Shear zones or Schist zones, Intrusive boundaries & Marker beds within the dataset buffer?

Map ID	Boundary Type	Description	Map Sheet Name	Distance
No Features				

Naturally Occurring Asbestos Potential

1110 Middle Head Road, Mosman, NSW 2088

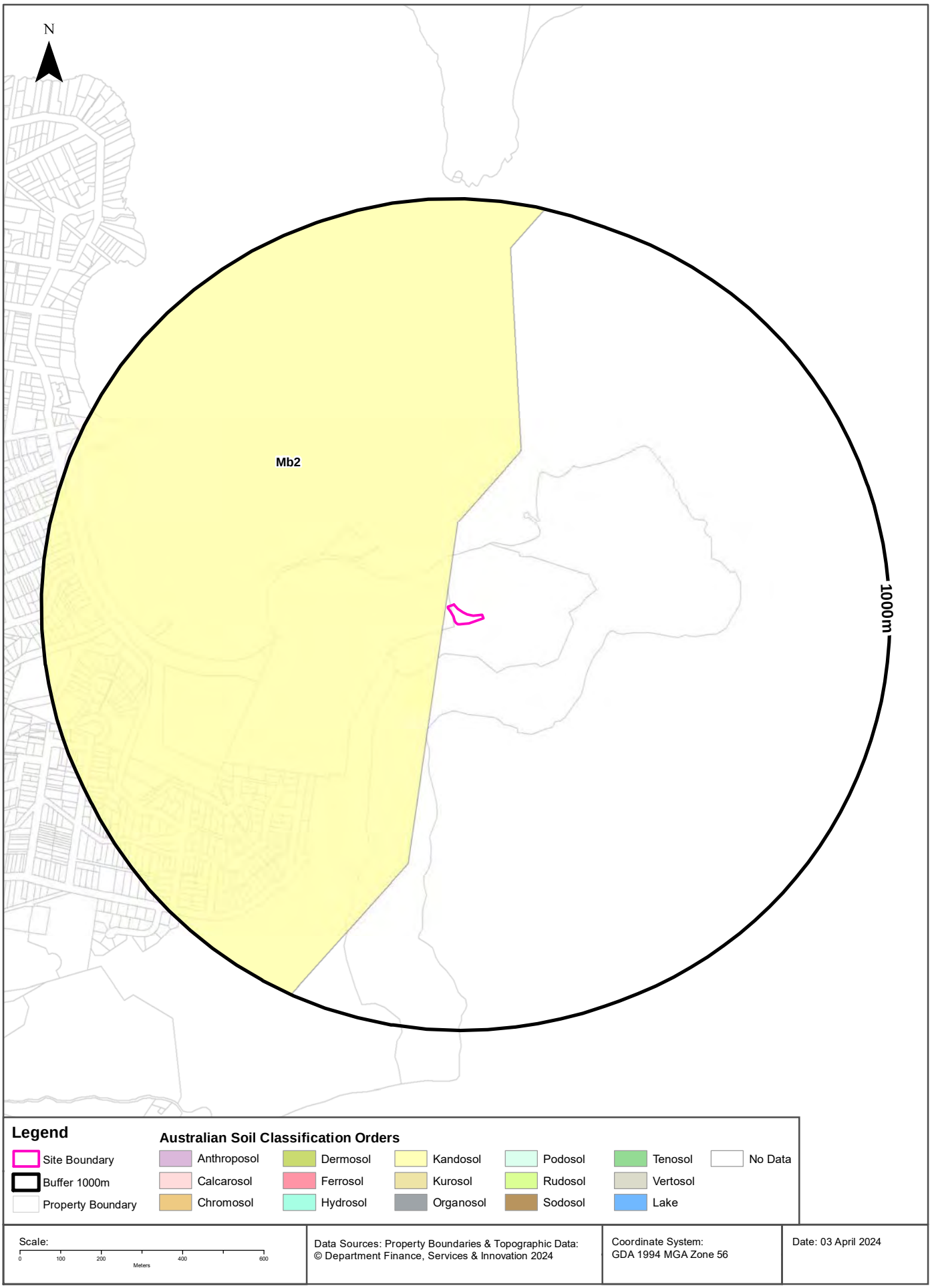
Naturally Occurring Asbestos Potential

Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Atlas of Australian Soils

1110 Middle Head Road, Mosman, NSW 2088



Soils

1110 Middle Head Road, Mosman, NSW 2088

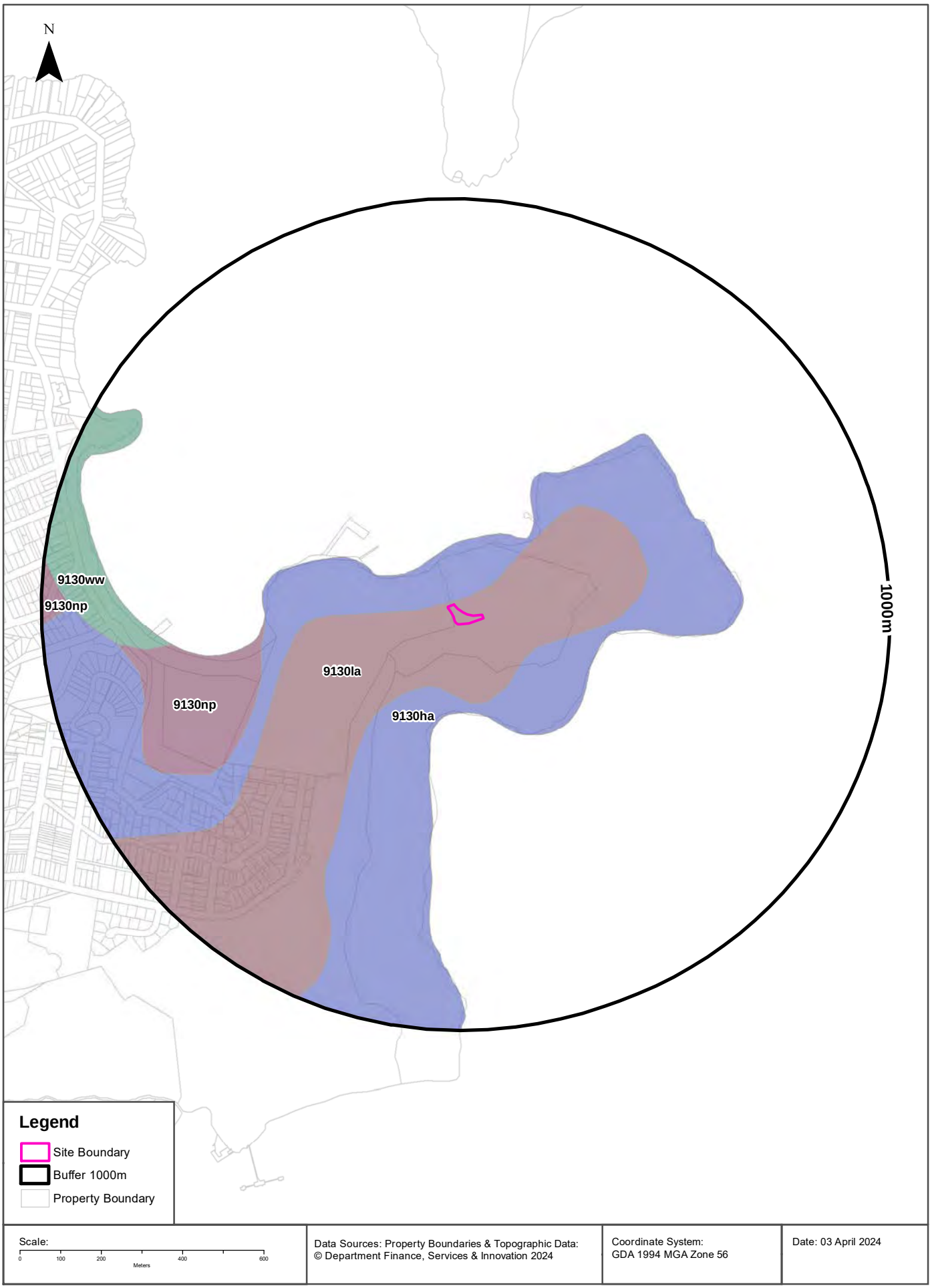
Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
Mb2	Kandosol	Dissected sandstone plateau of moderate to strong relief with sandstone pillars, ledges, and slabs-- level to undulating ridges, irregularly benched slopes, steep ridges, cliffs, canyons, narrow sandy valleys: chief soils are (i) on areas of gentle to moderate relief, acid yellow leached earths (Gn2.74) and (Gn2.34) and acid leached yellow earths (Gn2.24)- sometimes these soils contain ironstone gravel; and (ii) on, or adjacent to, areas of strong relief, siliceous sands (Uc1.2), leached sands (Uc2.12) and (Uc2.2), and shallow forms of the above (Gn2) soils. Associated are: (i) on flat to gently undulating remnants of the original plateau surface, leached sands (Uc2.3), siliceous sands (Uc1.2), sandy earths (Uc5.22), and (Gn2) soils as for (i) above (these areas are in part comparable with unit Cb29); (ii) on flat ironstone gravelly remnants of the original plateau surface, (Gn2) soils as for unit Mb5(i); (iii) on gently undulating ridges where interbedded shales are exposed, shallow, often stony (Dy3.41), (Dr2.21), and related soils similar to unit Tb35; (iv) narrow valleys of (Uc2.3) soils flanked by moderate slopes of (Dy3.41) soils; (v) escarpments of steep hills with shallow (Dy) and (Dr) soils between sandstone pillars; and (vi) shallow (Um) soils, such as (Um6.21) on steep hills of basic rocks. As mapped, minor areas of units Mg20, Mm1, and Mw8 are included. Data are limited.	7m	West

Soil Landscapes of Central and Eastern NSW

1110 Middle Head Road, Mosman, NSW 2088



Soils

1110 Middle Head Road, Mosman, NSW 2088

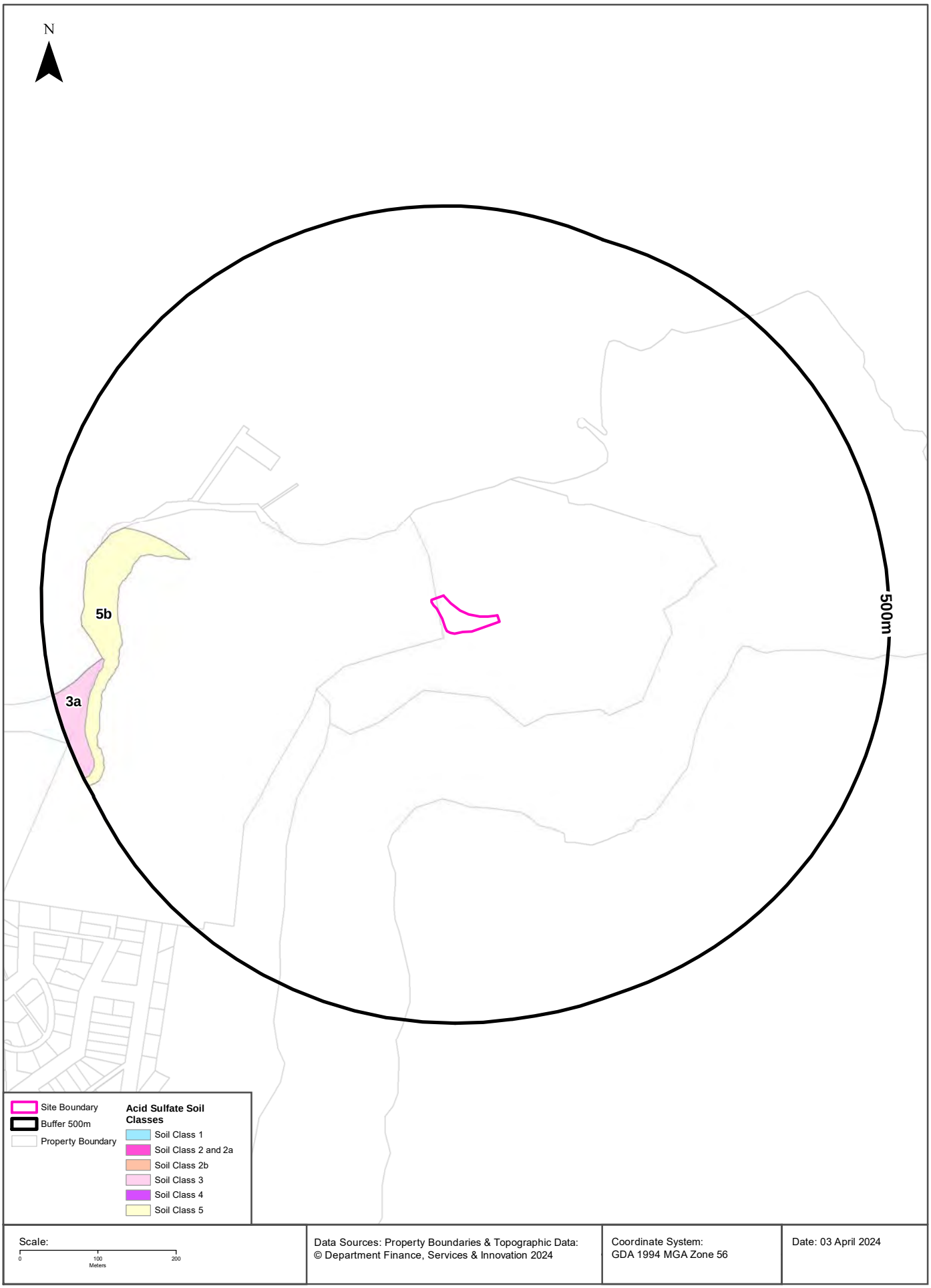
Soil Landscapes of Central and Eastern NSW

Soil Landscapes of Central and Eastern NSW within the dataset buffer:

Soil Code	Name	Distance	Direction
9130la	Lambert	0m	On-site
9130ha	Hawkesbury	11m	South West
9130np	Newport	451m	West
9130ww	Woy Woy	686m	West

Acid Sulfate Soils

1110 Middle Head Road, Mosman, NSW 2088



Acid Sulfate Soils

1110 Middle Head Road, Mosman, NSW 2088

Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

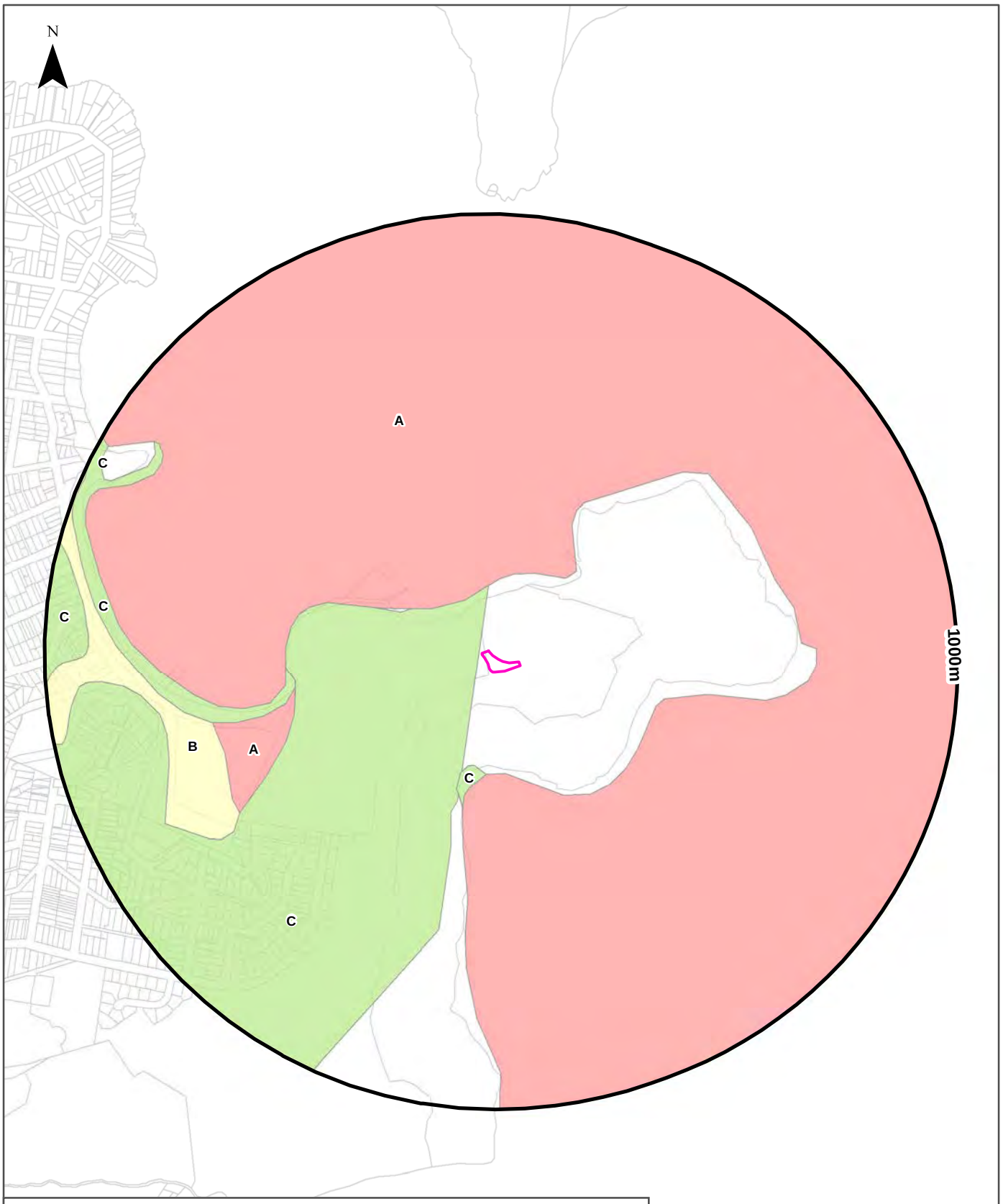
Soil Class	Description	EPI Name
N/A		

If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI Name	Distance	Direction
N/A				

Atlas of Australian Acid Sulfate Soils

1110 Middle Head Road, Mosman, NSW 2088



Legend

Site Boundary
Buffer 1000m
Property Boundary

Probability of occurrence of Acid Sulfate Soils

A. High (>70%)
B. Low (6-70%)
C. Extremely Low (1-5%)
D. No Chance (0%)
No Data

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2024

Coordinate System: GDA 1994 MGA Zone 56

Date: 03April 2024

Acid Sulfate Soils

1110 Middle Head Road, Mosman, NSW 2088

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance	Direction
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	8m	South West
A	High Probability of occurrence. >70% chance of occurrence.	128m	North East
B	Low Probability of occurrence. 6-70% chance of occurrence.	631m	West

Dryland Salinity

1110 Middle Head Road, Mosman, NSW 2088

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A		

Dryland Salinity Data Source : National Land and Water Resources Audit
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Mining

1110 Middle Head Road, Mosman, NSW 2088

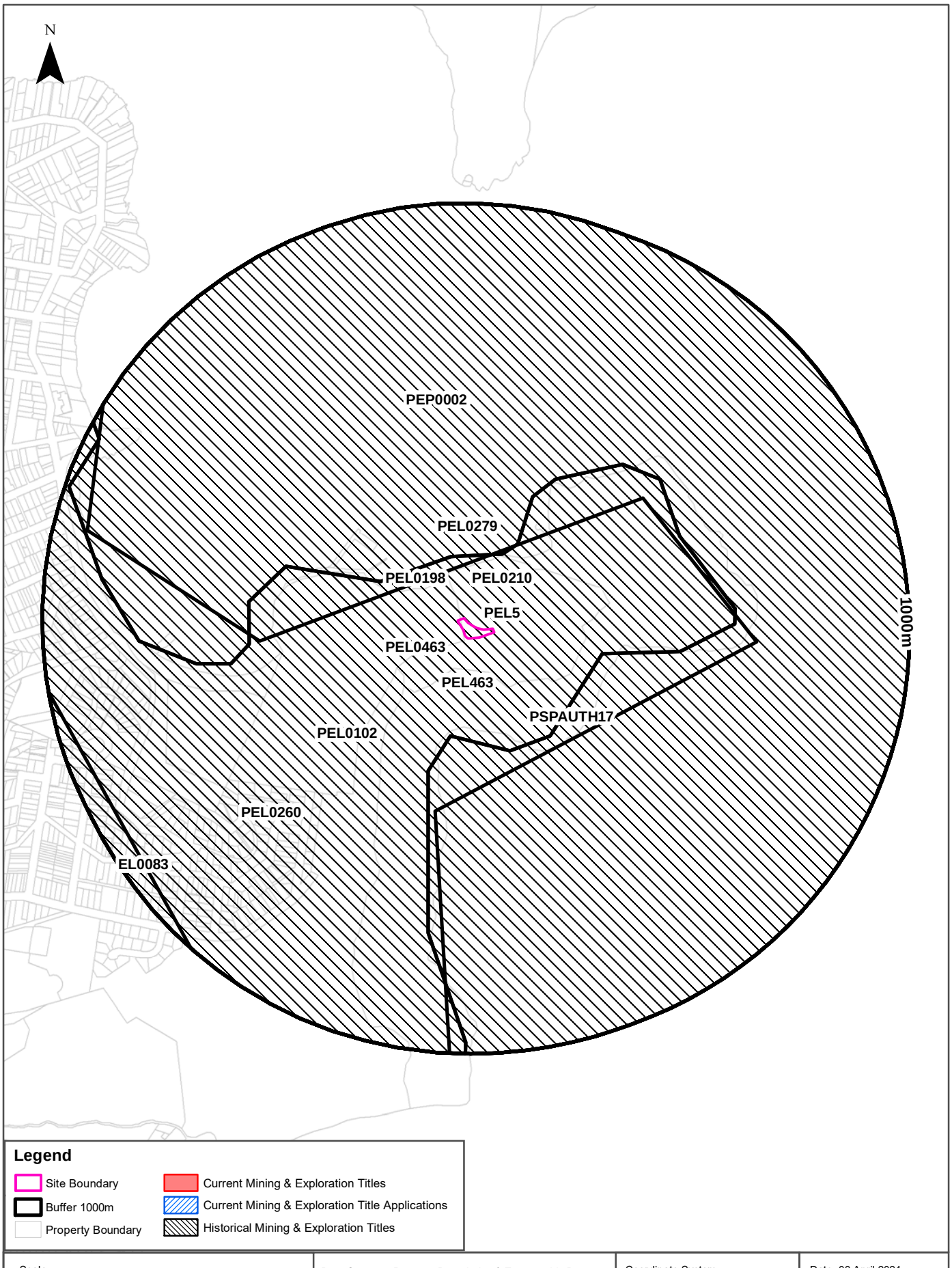
Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

Mining & Exploration Titles

1110 Middle Head Road, Mosman, NSW 2088



Mining

1110 Middle Head Road, Mosman, NSW 2088

Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Grant Date	Expiry Date	Last Renewed	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer								

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

Application Ref	Applicant	Application Date	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer						

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

Mining

1110 Middle Head Road, Mosman, NSW 2088

Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Start Date	End Date	Resource	Minerals	Dist	Dir
PEL463	DART ENERGY (APOLLO) PTY LTD	20081022	20130227	MINERALS		0m	On-site
PEL5	AGL UPSTREAM INVESTMENTS PTY LIMITED	19931111	20011210	MINERALS		0m	On-site
PSPAUTH17	MACQUARIE ENERGY PTY LTD	20070803	20080703	PETROLEUM	Petroleum	0m	On-site
PEL0463	DART ENERGY (APOLLO) PTY LTD	20091010	20150603	PETROLEUM	Petroleum	0m	On-site
PEL0102	AUSTRALIAN OIL AND GAS CORPORATION LTD			PETROLEUM	Petroleum	0m	On-site
PEL0260	NORTH BULLI COLLIERIES PTY LTD, AGL PETROLEUM OPERATIONS PTY LTD, THE AUSTRALIAN GAS LIGHT CO.	19810909	19930803	PETROLEUM	Petroleum	0m	On-site
PEL0210	THE AUSTRALIAN GAS LIGHT COMPANY (AGL), NORTH BULLI COLLIERIES PTY LTD			PETROLEUM	Petroleum	0m	On-site
PEL0279	THE ELECTRICITY COMMISSION OF NSW (TRADING AS PACIFIC POWER)	19910504	19931111	PETROLEUM	Petroleum	0m	On-site
PEL0198	JOHN STREVENS (TERRIGAL) NL			PETROLEUM	Petroleum	0m	On-site
PEP0002	LASKAN MINERALS LTD			PETROLEUM	Petroleum	121m	North East
EL0083	CONTINENTAL OIL CO OF AUSTRALIA LIMITED	19670201	19680201	MINERALS		942m	South West

State Environmental Planning Policy

1110 Middle Head Road, Mosman, NSW 2088

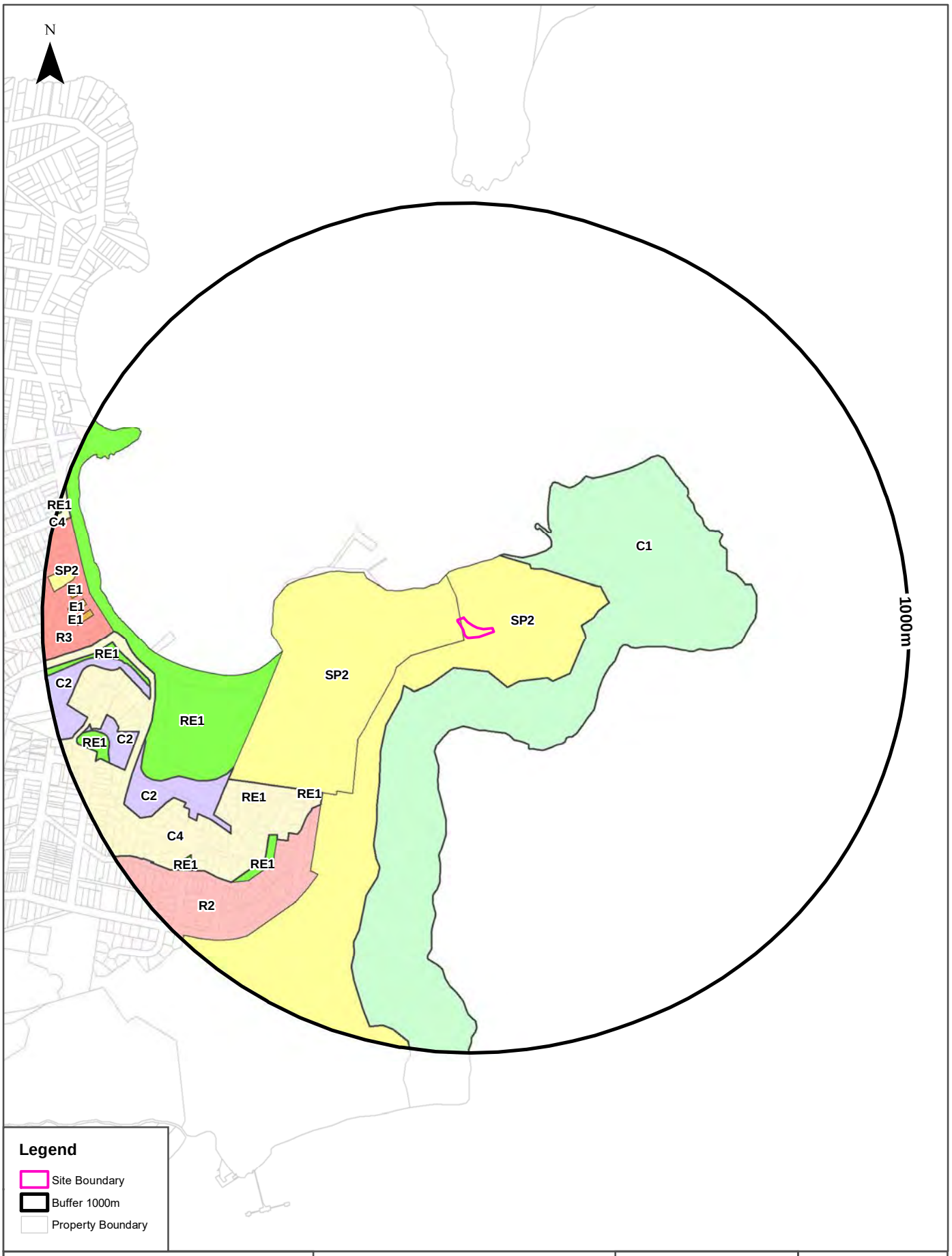
State Significant Precincts

What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No records in buffer							

EPI Planning Zones

1110 Middle Head Road, Mosman, NSW 2088



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2024
Planning: NSW Crown Copyright - Planning & Environment

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 April 2024

Environmental Planning Instrument

1110 Middle Head Road, Mosman, NSW 2088

Land Zoning

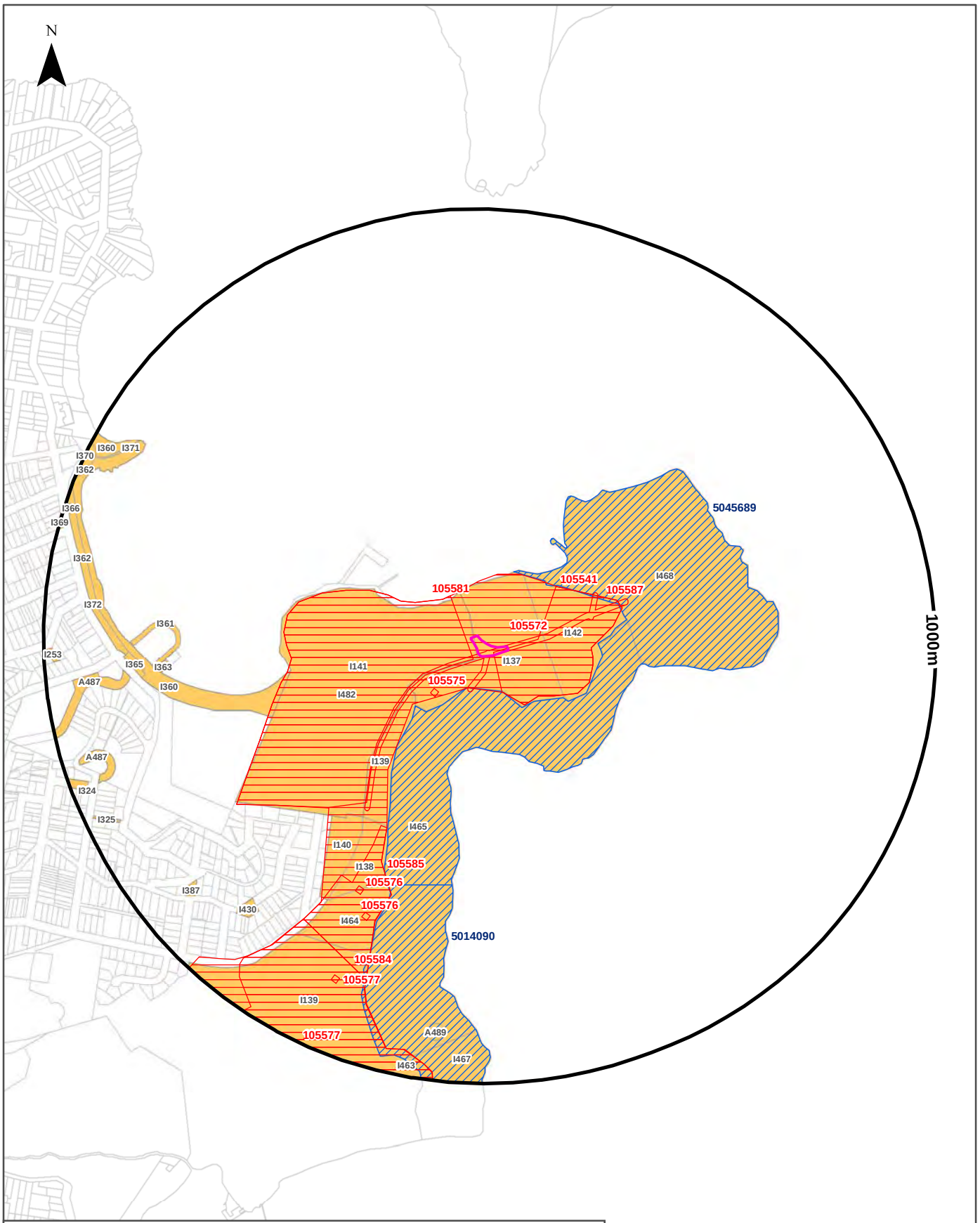
What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
SP2	Infrastructure	Defence	Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	0m	On-site
SP2	Infrastructure	Sydney Harbour Federation Trust	Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	0m	On-site
C1	National Parks and Nature Reserves		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	77m	South East
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	429m	West
C4	Environmental Living		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	512m	South West
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	523m	South West
R2	Low Density Residential		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	535m	South West
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	626m	South West
C2	Environmental Conservation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	643m	South West
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	659m	South West
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	756m	West
C2	Environmental Conservation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	758m	West
C2	Environmental Conservation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	812m	West
R3	Medium Density Residential		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	828m	West
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	845m	South West
E1	Local Centre		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	877m	West
CA	Complex Area		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	877m	West
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	888m	West
CA	Complex Area		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	894m	West
E1	Local Centre		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	894m	West

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
E1	Local Centre		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	910m	West
CA	Complex Area		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	910m	West
SP2	Infrastructure	Educational Establishment	Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	927m	West
RE1	Public Recreation		Mosman Local Environmental Plan 2012	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 1	989m	West

Heritage Items

1110 Middle Head Road, Mosman, NSW 2088



Legend

Property Boundary	Site Boundary	Commonwealth Heritage List	State Heritage Items
	Buffer 1000m	National Heritage List	EPI Heritage Items

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2024 Heritage - NSW Crown Copyright - Planning & Environment	Coordinate System: GDA 1994 MGA Zone 56	Date: 03 April 2024

Heritage

1110 Middle Head Road, Mosman, NSW 2088

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
105572	Military Road Framework - Defence Land	Middle Head Rd, Georges Heights NSW	1/13/026/0027	Historic	Listed place	22/06/2004	0m	On-site
105587	Ten Terminal Regiment Headquarters and AusAid Training Centre	Middle Head Rd, Georges Heights NSW	1/13/026/0037	Historic	Listed place	22/06/2004	0m	On-site
105541	Defence site - Georges Heights and Middle Head	Middle Head Rd, Georges Heights NSW	1/13/026/0026	Historic	Listed place	22/06/2004	0m	On-site
105581	HMAS Penguin	Middle Head Rd, Georges Heights NSW	1/13/026/0032	Historic	Listed place	22/06/2004	11m	West
105575	Golf Clubhouse (former)	Middle Head Rd, Georges Heights NSW	1/13/026/0028	Historic	Listed place	22/06/2004	128m	South West
105585	Thirty Terminal Squadron Precinct	Middle Head Rd, Georges Heights NSW	1/13/026/0035	Historic	Listed place	22/06/2004	459m	South West
105576	Battery B42	Middle Head Rd, Georges Heights NSW	1/13/026/0029	Historic	Listed place	22/06/2004	609m	South West
105584	Headquarters Training Command Precinct	Middle Head Rd, Georges Heights NSW	1/13/026/0034	Historic	Listed place	22/06/2004	742m	South West
105577	Batteries A83 and C9A	Suakin Dr, Georges Heights NSW	1/13/026/0030	Historic	Listed place	22/06/2004	821m	South West

National Heritage List

What are the National Heritage List Items located within the dataset buffer?
Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
5045689	Middle Head Military Fortifications	Middle Head Road, Middle Head	MOSMAN	02/04/1999	00999	2283	77m	East
5014090	Georges Head Military Fortifications	Chowder Bay Roads, Georges Heights	MOSMAN	02/04/1999	00987	2942	540m	South

Environmental Planning Instrument - Heritage

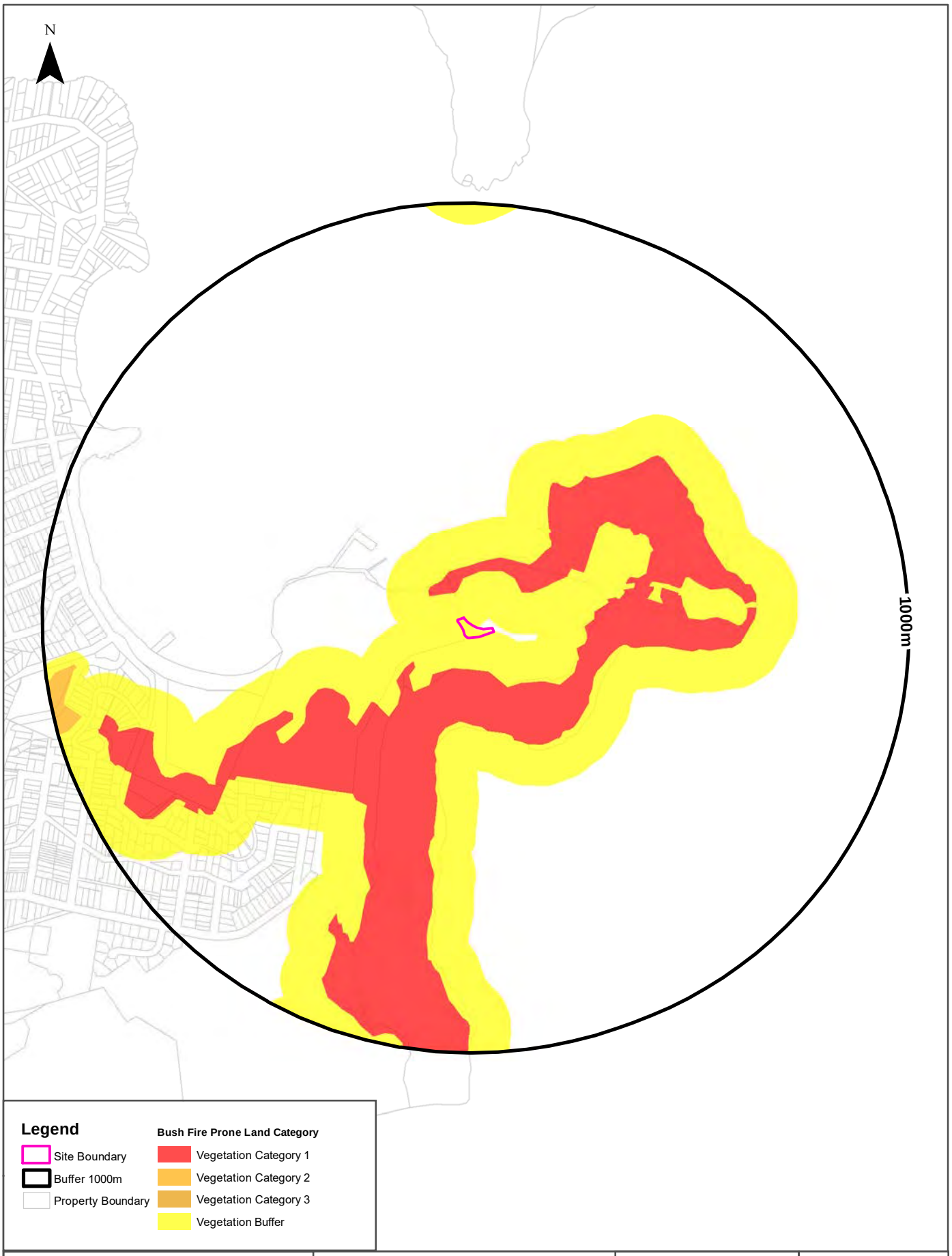
What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I141	HMAS Penguin Naval Base	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	0m	On-site
I482	Ventilation stack and former original septic tank, now a swimming pool	Item - General	Local	Mosman Local Environmental Plan 2012	24/06/2016	24/06/2016	09/02/2018	0m	On-site
I137	AUS AID Training Centre	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	0m	On-site
I465	Pair of Navigational Obelisks	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	77m	South
I142	10 Terminal Regiment HQ	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	87m	East
I468	Middle Head Fort Complex	Item - General	State	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	171m	East
I139	Georges Heights Military Barracks Complex	Item - General	State	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	177m	South West
I360	Balmoral Beach, including Edwards Beach	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	429m	West
I138	Defence Housing	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	455m	South West
I140	Group of Navy Cottages	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	467m	South West
I464	Obelisk Point Fortifications Complex	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	578m	South West
I361	Balmoral Beach Baths	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	680m	West
I363	Balmoral Boatshed site only	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	705m	West
I139	Georges Heights Military Barracks Complex	Item - General	State	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	730m	South West
I365	Balmoral Baths Pavilion	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	766m	West
I430	Pretoria Avenue Steps	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	778m	South West
I362	Balmoral Beach Promenade	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	802m	West
A487	Abandoned tramway cutting	Item - Archaeological	Local	Mosman Local Environmental Plan 2012	24/06/2016	24/06/2016	09/02/2018	803m	West
I387	Kahibah Road/ Coronation Avenue Steps	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	845m	South West
A489	Sydney Harbour National Park	Item - Archaeological	State	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	866m	South
I467	Semi-Underground Armoured Casemate Battery	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	875m	South

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
A487	Abandoned tramway cutting	Item - Archaeological	Local	Mosman Local Environmental Plan 2012	24/06/2016	24/06/2016	09/02/2018	882m	West
I372	Sewage Pumping Stations Nos. 69 & 70	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	884m	West
I371	Rocky Point Footbridge and Park Walkway	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	903m	North West
I360	Balmoral Beach, including Edwards Beach	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	906m	North West
I325	Bungaree Lane Steps	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	923m	South West
I324	Bayview Avenue/Gordon Street Divided Road	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	956m	West
I463	Georges Head Fortifications Complex	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	959m	South
I253	Flats	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	963m	West
I366	Bus Terminus Office and Shelter	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	981m	West
I369	Hunter Park, Western Section	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	989m	West
I370	Balmoral Beach Rotunda	Item - General	Local	Mosman Local Environmental Plan 2012	09/12/2011	09/12/2011	09/02/2018	998m	North West

Natural Hazards - Bush Fire Prone Land

1110 Middle Head Road, Mosman, NSW 2088



Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2024. Property Boundaries: © Department Finance, Services & Innovation 2024

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 April 2024

Natural Hazards

1110 Middle Head Road, Mosman, NSW 2088

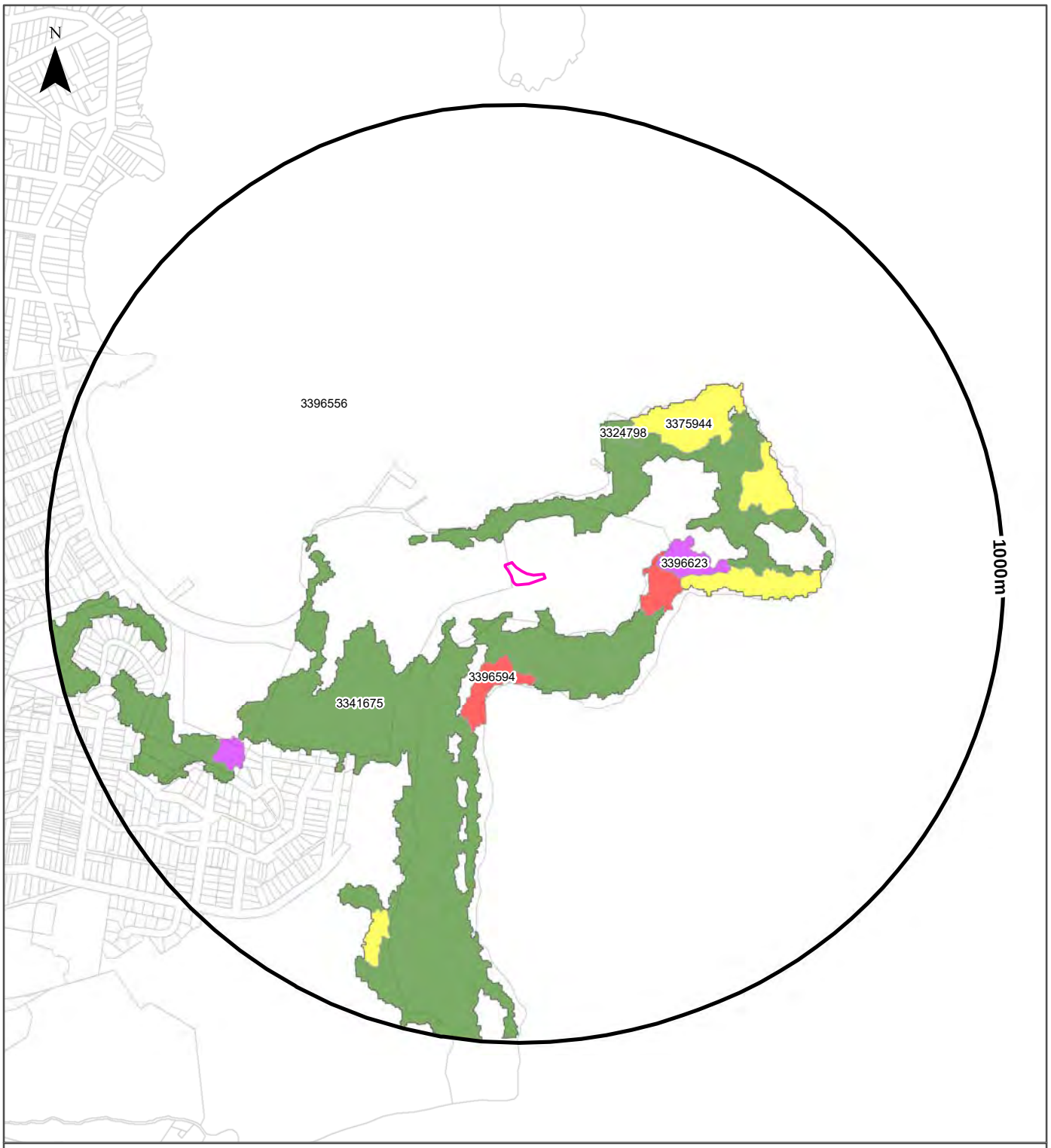
Bush Fire Prone Land

What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	On-site
Vegetation Category 1	66m	South
Vegetation Category 2	924m	West

Ecological Constraints - Vegetation & Ramsar Wetlands

1110 Middle Head Road, Mosman, NSW 2088



Ecological Constraints

1110 Middle Head Road, Mosman, NSW 2088

Native Vegetation

What native vegetation exists within the dataset buffer?

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3396556	Not classified	(Not classified) Not classified	Not classified	0m	On-site
3341675	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Foreshores Forest	Sydney Coastal Dry Sclerophyll Forests	51m	South West
3396594	Rainforests	(Rainforests) Sydney Coastal Lilly Pilly-Palm Gallery Rainforest	Northern Warm Temperate Rainforests	153m	South
3396623	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	244m	East
3375944	Heathlands	(Heathlands) Sydney Coastal Sandstone Headland Heath	Sydney Coastal Heaths	294m	East
3324798	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Coastal Sands Littoral Scrub-Forest	Coastal Dune Dry Sclerophyll Forests	323m	North East

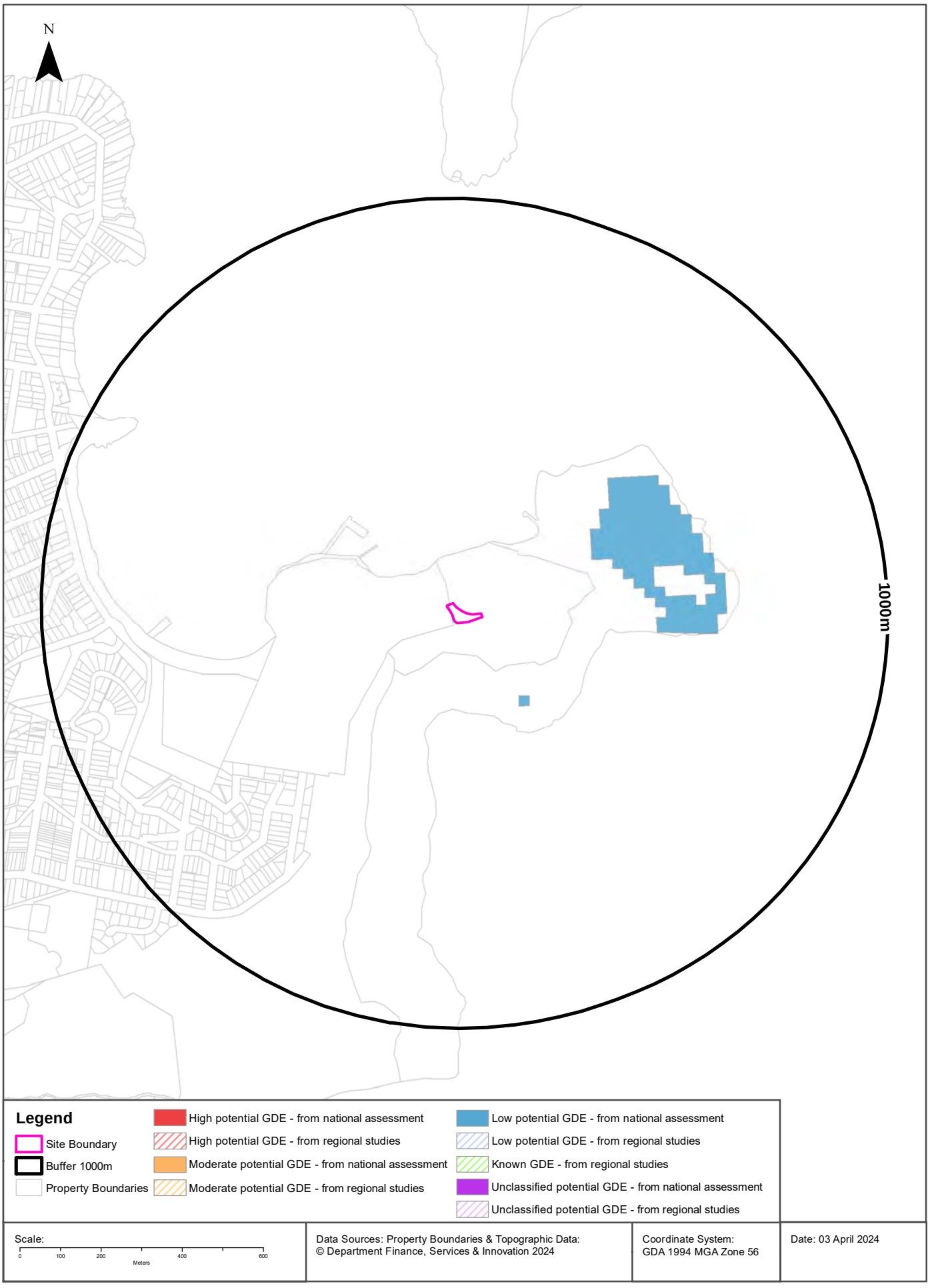
Ramsar Wetlands

What Ramsar Wetland areas exist within the dataset buffer?

Map Id	Ramsar Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

Ecological Constraints - Groundwater Dependent Ecosystems Atlas

1110 Middle Head Road, Mosman, NSW 2088



Ecological Constraints

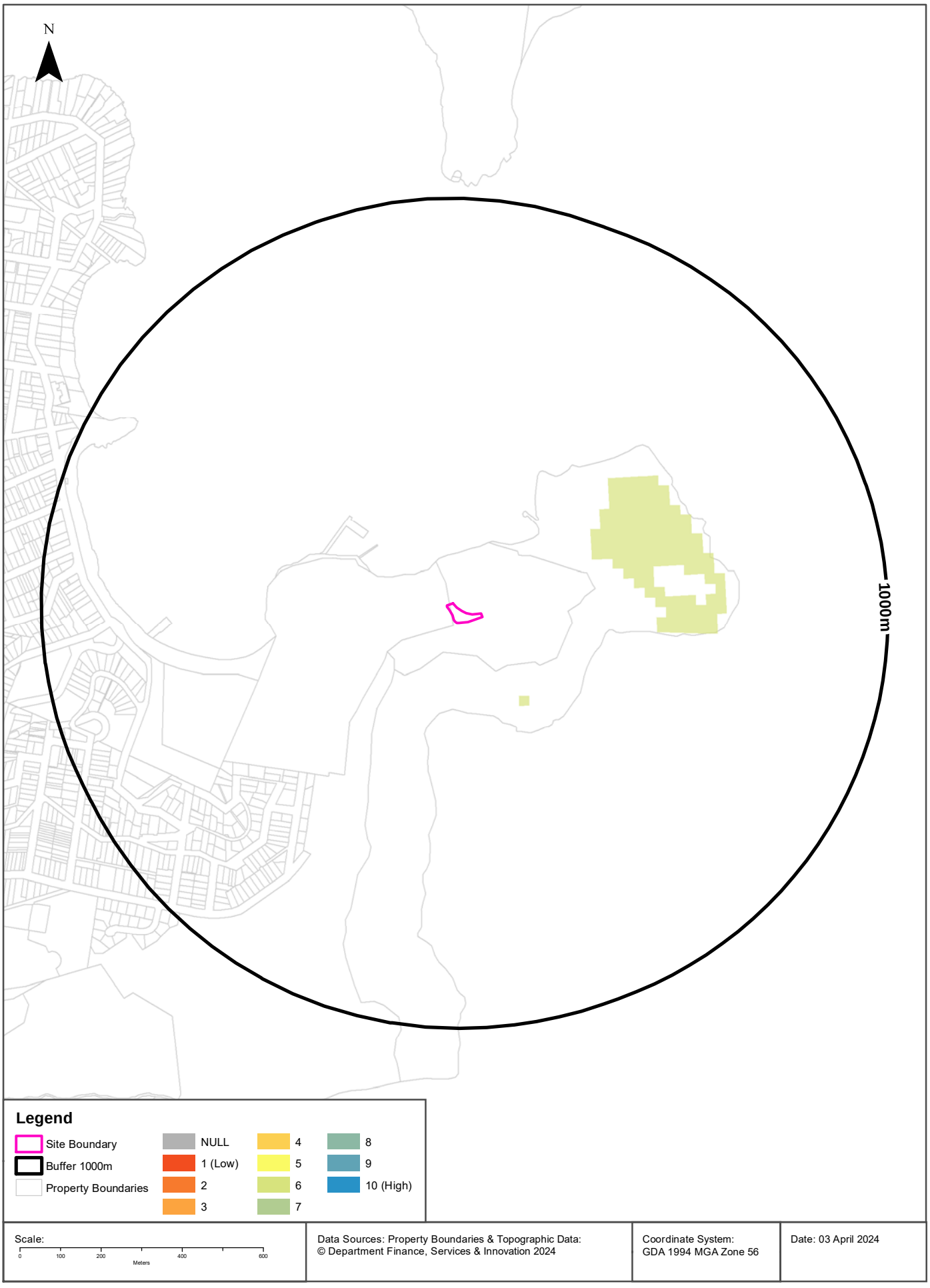
1110 Middle Head Road, Mosman, NSW 2088

Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	Low potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	214m	South East

Ecological Constraints - Inflow Dependent Ecosystems Likelihood

1110 Middle Head Road, Mosman, NSW 2088



Ecological Constraints

1110 Middle Head Road, Mosman, NSW 2088

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	6	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	214m	South East

Ecological Constraints

1110 Middle Head Road, Mosman, NSW 2088

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Heleioporus australiacus	Giant Burrowing Frog	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Amphibia	Litoria aurea	Green and Golden Bell Frog	Endangered	Not Sensitive	Vulnerable	
Animalia	Amphibia	Pseudophryne australis	Red-crowned Toadlet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Actitis hypoleucos	Common Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Anous stolidus	Common Noddy	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Anseranas semipalmata	Magpie Goose	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Category 2	Critically Endangered	
Animalia	Aves	Apus pacificus	Fork-tailed Swift	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Ardenna carneipes	Flesh-footed Shearwater	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Ardenna grisea	Sooty Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ardenna pacifica	Wedge-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ardenna tenuirostris	Short-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Arenaria interpres	Ruddy Turnstone	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Botaurus poiciloptilus	Australasian Bittern	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Burhinus grallarius	Bush Stone-curlew	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Calidris acuminata	Sharp-tailed Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris alba	Sanderling	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Endangered	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris melanotos	Pectoral Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Calidris ruficollis	Red-necked Stint	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris tenuirostris	Great Knot	Vulnerable	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Category 3	Endangered	
Animalia	Aves	Calonectris leucomelas	Streaked Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calyptorhynchus banksii banksii	Red-tailed Black-Cockatoo (coastal subspecies)	Critically Endangered	Category 2	Not Listed	
Animalia	Aves	Calyptorhynchus banksii samueli	Red-tailed Black-Cockatoo (inland subspecies)	Vulnerable	Category 2	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Vulnerable	Category 2	Vulnerable	
Animalia	Aves	Chthonicola sagittata	Speckled Warbler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Cinclosoma castanotum	Chestnut Quail-thrush	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Cuculus optatus	Oriental Cuckoo	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Diomedea exulans	Wandering Albatross	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Epthianura albifrons	White-fronted Chat	Endangered Population, Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Erythrotriorchis radiatus	Red Goshawk	Endangered	Category 2	Endangered	
Animalia	Aves	Esacus magnirostris	Beach Stone-curlew	Critically Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Eudyptula minor	Little Penguin	Endangered Population	Not Sensitive	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Fregata ariel	Lesser Frigatebird	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus longirostris	Pied Oystercatcher	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Sensitive	Vulnerable	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Hydroprogne caspia	Caspian Tern	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Lathamus discolor	Swift Parrot	Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Limosa lapponica	Bar-tailed Godwit	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Macronectes giganteus	Southern Giant Petrel	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Menura alberti	Albert's Lyrebird	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Neophema pulchella	Turquoise Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox connivens	Barking Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Numenius madagascariensis	Eastern Curlew	Not Listed	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Numenius minutus	Little Curlew	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Numenius phaeopus	Whimbrel	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Onychoprion fuscata	Sooty Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Oxyura australis	Blue-billed Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pachycephala olivacea	Olive Whistler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pandion cristatus	Eastern Osprey	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Petroica boodang	Scarlet Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pezoporus wallicus wallicus	Eastern Ground Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Phaethon lepturus	White-tailed Tropicbird	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Phaethon rubricauda	Red-tailed Tropicbird	Vulnerable	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Philomachus pugnax	Ruff	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Phoebetria fusca	Sooty Albatross	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Pluvialis fulva	Pacific Golden Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pluvialis squatarola	Grey Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	Endangered	Category 3	Vulnerable	
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Vulnerable	Category 3	Vulnerable	
Animalia	Aves	Pterodroma leucoptera leucoptera	Gould's Petrel	Vulnerable	Not Sensitive	Endangered	
Animalia	Aves	Pterodroma nigripennis	Black-winged Petrel	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pterodroma solandri	Providence Petrel	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Puffinus assimilis	Little Shearwater	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stercorarius longicaudus	Long-tailed Jaeger	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Stercorarius maccormicki	South Polar Skua	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Stercorarius parasiticus	Arctic Jaeger	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Stercorarius pomarinus	Pomarine Jaeger	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sterna hirundo	Common Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sternula albifrons	Little Tern	Endangered	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sula dactylatra	Masked Booby	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Thalassarche bulleri	Buller's Albatross	Not Listed	Not Sensitive	Vulnerable	
Animalia	Aves	Thalassarche cauta	Shy Albatross	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Thalassarche chrysostoma	Grey-headed Albatross	Not Listed	Not Sensitive	Endangered	
Animalia	Aves	Thalassarche melanophris	Black-browed Albatross	Vulnerable	Not Sensitive	Vulnerable	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Thalasseus bergii	Crested Tern	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Thinornis cucullatus cucullatus	Eastern Hooded Dotterel	Critically Endangered	Not Sensitive	Vulnerable	
Animalia	Aves	Todiramphus chloris	Collared Kingfisher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Tringa incana	Wandering Tattler	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Tringa nebularia	Common Greenshank	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Tyto tenebricosa	Sooty Owl	Vulnerable	Category 3	Not Listed	
Animalia	Insecta	Petalura gigantea	Giant Dragonfly	Endangered	Not Sensitive	Not Listed	
Animalia	Mammalia	Aepyprymnus rufescens	Rufous Bettong	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Arctocephalus forsteri	New Zealand Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Arctocephalus pusillus doriferus	Australian Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Balaenoptera musculus	Blue Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Dasyurus viverrinus	Eastern Quoll	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Dugong dugon	Dugong	Endangered	Not Sensitive	Not Listed	
Animalia	Mammalia	Eubalaena australis	Southern Right Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Macrotis lagotis	Bilby	Extinct	Not Sensitive	Vulnerable	
Animalia	Mammalia	Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus australis	Little Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Notomys cervinus	Fawn Hopping-mouse	Extinct	Not Sensitive	Not Listed	
Animalia	Mammalia	Notomys mitchellii	Mitchell's Hopping-mouse	Extinct	Not Sensitive	Not Listed	
Animalia	Mammalia	Perameles nasuta	Long-nosed Bandicoot	Endangered Population	Not Sensitive	Not Listed	
Animalia	Mammalia	Petaurus norfolcensis	Squirrel Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Physeter macrocephalus	Sperm Whale	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Pseudomys hermannsburgensis	Sandy Inland Mouse	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Pseudomys novaehollandiae	New Holland Mouse	Not Listed	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Vespadelus troughtoni	Eastern Cave Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Aspidites ramsayi	Woma	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Caretta caretta	Loggerhead Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	Chelonia mydas	Green Turtle	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Dermochelys coriacea	Leatherback Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	Diplodactylus platyurus	Eastern Fat-tailed Gecko	Endangered	Not Sensitive	Not Listed	
Animalia	Reptilia	Eretmochelys imbricata	Hawksbill Turtle	Not Listed	Not Sensitive	Vulnerable	
Animalia	Reptilia	Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Myuchelys bellii	Western Sawshelled Turtle, Bell's Turtle	Endangered	Not Sensitive	Vulnerable	
Animalia	Reptilia	Tiliqua occipitalis	Western Blue-tongued Lizard	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Uvidicolus sphyrurus	Border Thick-tailed Gecko	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Varanus rosenbergi	Rosenberg's Goanna	Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Camarophyllopsis kearneyi		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe anomala var. ianthinomarginata		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe aurantipes		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe austropratensis		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe collucera		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe griseoramosa		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe lanecovensis		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe reesiae		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	Hygrocybe rubronivea		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia bynoeana	Bynoe's Wattle	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia gordonii		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Acacia terminalis subsp. Eastern Sydney	Sunshine wattle	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Allocasuarina portuensis	Nielsen Park She-oak	Endangered	Category 3	Endangered	
Plantae	Flora	Amperea xiphoclada var. pedicellata		Extinct	Not Sensitive	Extinct	
Plantae	Flora	Asterolasia buxifolia		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Baeckea kandos		Endangered	Category 3	Endangered	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Caladenia tessellata	Thick Lip Spider Orchid	Endangered	Category 2	Vulnerable	
Plantae	Flora	Callistemon linearifolius	Netted Bottle Brush	Vulnerable	Category 3	Not Listed	
Plantae	Flora	Chamaesyce psammogeton	Sand Spurge	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Darwinia biflora		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Dichanthium setosum	Bluegrass	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Doryanthes palmeri	Giant Spear Lily	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Epacris purpurascens var. purpurascens		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus camfieldii	Camfield's Stringybark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus fracta	Broken Back Ironbark	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus leucoxylon subsp. pruinosa	Yellow Gum	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus pulverulenta	Silver-leafed Gum	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus scoparia	Wallangarra White Gum	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Euphrasia collina subsp. muelleri	Mueller's Eyebright	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Genoplesium baueri	Bauer's Midge Orchid	Endangered	Category 2	Endangered	
Plantae	Flora	Grammitis stenophylla	Narrow-leaf Finger Fern	Endangered	Category 3	Not Listed	
Plantae	Flora	Grevillea caleyi	Caley's Grevillea	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Hibbertia puberula		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Hibbertia superans		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Lasiopetalum joyceae		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Leptospermum deanei		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia integrifolia	Macadamia Nut	Not Listed	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia tetraphylla	Rough-shelled Bush Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Melaleuca biconvexa	Biconvex Paperbark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Melaleuca deanei	Deane's Paperbark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Microtis angusii	Angus's Onion Orchid	Endangered	Category 2	Endangered	
Plantae	Flora	Persoonia hirsuta	Hairy Geebung	Endangered	Category 3	Endangered	
Plantae	Flora	Persoonia laxa		Extinct	Not Sensitive	Extinct	
Plantae	Flora	Pimelea curviflora var. curviflora		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Prasophyllum fuscum	Slaty Leek Orchid	Critically Endangered	Category 2	Vulnerable	
Plantae	Flora	Prostanthera marifolia	Seaforth Mintbush	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Rhodamnia rubescens	Scrub Turpentine	Critically Endangered	Not Sensitive	Critically Endangered	
Plantae	Flora	Sarcochilus hartmannii	Hartman's Sarcochilus	Vulnerable	Category 2	Vulnerable	
Plantae	Flora	Senecio spathulatus	Coast Groundsel	Endangered	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Tetratheca glandulosa		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Tetratheca juncea	Black-eyed Susan	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Thesium australe	Austral Toadflax	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Triplarina imbricata	Creek Triplarina	Endangered	Not Sensitive	Endangered	

Data does not include NSW category 1 sensitive species.

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

LC Code	Location Confidence
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced to an approximate or general area
Road Match	Georeferenced to a road or rail corridor
Road Intersection	Georeferenced to a road intersection
Buffered Point	A point feature buffered to x metres
Adjacent Match	Land adjacent to a georeferenced feature
Network of Features	Georeferenced to a network of features
Suburb Match	Georeferenced to a suburb boundary
As Supplied	Spatial data supplied by provider

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    irrespective of how that liability arises including in contract or tort, liability under indemnity or for any other common law, equitable or statutory cause of action or otherwise.
12. These Terms are subject to New South Wales law.

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10/04/2024

Lotsearch
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NORTH SYDNEY NSW 2060

Certificate 34374

Environmental Planning & Assessment Act 1979

Planning Certificate Section 10.7(2)

Property: 1110 Middle Head Road MOSMAN 2088

Title: PT: 203 DP: 1022020

1. Names of relevant environmental planning instruments and development control plans

(1) The name of each environmental planning instrument and development control plan that applies to the carrying out of development on the land.

Local Environment Plans
Mosman Local Environmental Plan 2012

State Environmental Planning Policies
State Environmental Planning Policy (Sustainable Buildings) 2022
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
State Environmental Planning Policy (Housing) 2021
State Environmental Planning Policy (Planning Systems) 2021
State Environmental Planning Policy (Biodiversity and Conservation) 2021
State Environmental Planning Policy (Resilience and Hazards) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021
State Environmental Planning Policy (Industry and Employment) 2021
State Environmental Planning Policy (Resources and Energy) 2021
State Environmental Planning Policy (Primary Production) 2021
State Environmental Planning Policy (Precincts—Eastern Harbour City) 2021

Development Control Plans
Mosman Open Space & Infrastructure Development Control Plan 2012

Sydney Harbour Foreshores and Waterways Area Development Control Plan 2005.

(2) The name of each proposed environmental planning instrument and draft development control plan, which is or has been subject to community consultation or public exhibition under the Act, that will apply to the carrying out of development on the land.

Proposed Local Environment Plans
Not affected by any proposed local environmental plan or planning proposal.

Proposed State Environmental Planning Policies
Explanation of Intended Effect: Changes to create low and mid-rise housing 2023
SEPP (Housing) 2022 Amendment
Transport and Infrastructure SEPP (Chapter 4 Major Infrastructure Corridors) Amendment
SEPP (Exempt and Complying Development Codes) 2008 (Outdoor dining on private land and at registered clubs) Amendment
Explanation of Intended Effect: Improving planning processes to deliver infrastructure faster, March 2024

Draft Development Control Plans
Not affected by any draft development control plans.

Note – The site is affected by Commonwealth legislation and plans including:

Sydney Harbour Federation Trust Act 2001
Environment Protection and Biodiversity Conservation Act 1999
Sydney Harbour Trust Comprehensive Plan
Middle Head/Gubbuh Gubbuh Master Plan 2023

2. Zoning and land use under relevant planning instruments

(a) The identity of the zone

Mosman Local Environmental Plan 2012

Zone SP2 – Infrastructure

(b) The purposes for which development in the zone:

(i) may be carried out without development consent

Nil

(ii) may not be carried out except with development consent

Aquaculture; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose; Roads

(iii) is prohibited

Any development not specified in item (i) or (ii) above

Additional prohibited development:

The land is subject to clause 2.9 to *Mosman Local Environmental Plan 2012* which prohibits canal estate development on any land to which *Mosman Local Environmental Plan 2012* applies.

(c) whether additional permitted uses apply to the land

No additional permitted uses apply to the land.

(d) whether development standards apply to the land fixing minimum land dimensions for the erection of a dwelling house on the land, and if so, the fixed minimum land dimensions

There are no development standards under *Mosman Local Environmental Plan 2012* applying to the land fixing dimensions for the erection of a dwelling house.

(e) whether the land is an area of outstanding biodiversity value under the *Biodiversity Conservation Act 2016*

The land does not include or comprise an area of outstanding biodiversity value under the *Biodiversity Conservation Act 2016*.

(f) whether the land is in a conservation area, however described

Not within a Heritage Conservation Area under Mosman Local Environmental Plan 2012.

(g) whether an item of environmental heritage, however described, is located on the land

Does not contain a listed heritage item under Mosman Local Environmental Plan 2012.

3. Contributions

(1) The name of each contributions plan under the Act, Division 7.1 applying to the land, including draft contributions plans.

No contribution plans apply to the land.

(2) If the land is in a region within the meaning of the Act, Division 7.1, Subdivision 4—
(a) the name of the region, and
(b) the name of the Ministerial planning order in which the region is identified.

The land is within Greater Sydney to which the *Environmental Planning and Assessment (Housing and Productivity Contribution) Order 2023* applies.

(3) If the land is in a special contributions area to which a continued 7.23 determination applies, the name of the area.

The land is not within a special contributions area to which a continued 7.23 determination applies.

(4) In this section—
continued 7.23 determination means a 7.23 determination that—
(a) has been continued in force by the Act, Schedule 4, Part 1, and
(b) has not been repealed as provided by that part.
Note—
The Act, Schedule 4, Part 1 contains other definitions that affect the interpretation of this section.

4. Complying Development

(1) If the land is land on which complying development may be carried out under each of the complying development codes under *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* because of that Policy, clause 1.17A (1) (c) - (e), (2), (3) or (4), 1.18 (1) (c3) or 1.19.

See detail under each individual Code below.

(2) If complying development may not be carried out on the land because of 1 of those clauses, the reasons why it may not be carried out under the clause.

See detail under each individual Code below.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that—

(a) a restriction applies to the land, but it may not apply to all of the land, and

(b) the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

See detail under each individual Code below.

(4) If the complying development codes are varied, under that Policy, clause 1.12, in relation to the land.

Clause 1.12 does not apply to any of the land in the Mosman local government area in relation to complying development.

Part 3 Housing Code

The land is land on which complying development may not be carried out under the Housing Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Note: Notwithstanding, complying development under Part 3 Housing Code cannot be carried out on any land zoned C4 Environmental Living or in any employment zone in Mosman, as a consequence of clauses 3.1(3)(a) of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Part 3A Rural Housing Code

The land is land on which complying development may not be carried out under the Part 3A Rural Housing Code pursuant to *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Reason:
The Rural Housing Code does not apply to the land.

Part 3B Low Rise Housing Diversity Code

The land is land on which complying development may not be carried out under the Low Rise Housing Diversity Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Note: Notwithstanding, complying development under Part 3B Low Rise Housing Diversity Code cannot be carried out on any land zoned R2 Low Density Residential C4 Environmental Living or in any employment zone in Mosman, as a consequence of clauses 1.18(1)(b) and 3B.1A and 3B.1(3)(a) of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Part 3C Greenfield Housing Code

The land is land on which complying development may not be carried out under the Part 3C Greenfield Housing Code pursuant to *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Reason:
The Greenfield Housing Code does not apply to the land.

Part 3D Inland Code

The land is land on which complying development may not be carried out under the Part 3D Inland Code pursuant *to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Reason:
The Inland Code does not apply to the land.

Part 4 Housing Alterations Code
The land is land on which complying development may not be carried out under the Housing Alterations Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 4A General Development Code
The land is land on which complying development may not be carried out under the General Development Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. The land is affected by the following land exemptions:

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 5 Industrial and Business Alterations Code

The land is land on which complying development may not be carried out under Industrial and Business Alterations Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. The land is affected by the following land exemptions:

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 5A Industrial and Business Buildings Code

The land is land on which complying development may not be carried out under the Industrial and Business Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 5B Container Recycling Facilities Code

The land is land on which complying development may be carried out under the Container Recycling Facilities Code pursuant to State Environmental Planning Policy (Exempt and Comply Development Codes) 2008.

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 6 Subdivisions Code

The land is land on which complying development may not be carried out under the Subdivisions Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. The land is affected by the following land exemptions:

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 7 Demolition Code

The land is land on which complying development may not be carried out under the Demolition Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. The land is affected by the following land exemptions:

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying

development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 8 Fire Safety Code

The land is land on which complying development may not be carried out under the Fire Safety Code pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. The land is affected by the following land exemptions:

Reason: The land is wholly identified as an item of environmental heritage or a heritage item by an environmental planning instrument or on which is located an item that is so identified.

The land is partly identified as being within an environmentally sensitive area.

Note: A restriction applies to the land, but it may not apply to all of the land. Council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land. Despite the Planning Certificate stating that complying development may not be undertaken under the complying development Codes to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, complying development may be able to be undertaken on the subject land which is only partly affected by a land exclusion.

Part 9 Agritourism and Farm Stay Accommodation Code

The land is land on which complying development may not be carried out under the Part 9 Agritourism and Farm Stay Accommodation Code pursuant to *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Reason:
The Agritourism and Farm Stay Accommodation Code does not apply to the land.

5. Exempt Development

(1) If the land is land on which exempt development may be carried out under each of the exempt development codes under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, because of that Policy, clause 1.16(1)(b1)-(d) or 1.16A.

General Exempt Development Code

The land is land on which exempt development may be carried out under the General Exempt Development Code pursuant to *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Advertising and Signage Exempt Development Code

The land is land on which exempt development may be carried out under the Advertising and Signage Exempt Development Code pursuant to *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Temporary Uses and Structures Exempt Development Code

The land is land on which exempt development may be carried out under the Temporary Uses and Structures Exempt Development Code pursuant to *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

(2) If exempt development may not be carried out on the land because of (i) of those clauses, the reasons why they may not be carried out under the clause.

Not Relevant

(3) If the council does not have sufficient information to ascertain the extent to which exempt development may or may not be carried out on the land, a statement that—

(a) a restriction applies to the land, but it may not apply to all of the land, and

(b) the council does not have sufficient information to ascertain the extent to which exempt development may or may not be carried out on the land.

Not relevant.

(4) If the exempt development codes are varied, under that Policy, clause 1.12, in relation to the land.

Clause 1.12 does not apply to any land in the Mosman local government area in relation to exempt development.

6. Affected building notices and building product rectification orders

(1) Whether the council is aware that—

(a) an affected building notice is in force in relation to the land, or

(b) a building product rectification order is in force in relation to the land that has not been fully complied with, or

(c) a notice of intention to make a building product rectification order given in relation to the land is outstanding.

(2) In this section—
affected building notice has the same meaning as in the *Building Products (Safety) Act 2017*, Part 4.

building product rectification order has the same meaning as in the *Building Products (Safety) Act 2017*.

As far as Council is aware:

(a) There is no affected building notice of which the council is aware that is in force in relation to the land.

(b) There is no building product rectification order of which the council is aware that is in force in relation to the land and that has not been fully complied with.

(c) There is no notice of intention to make a building product rectification order of which the council is aware in relation to the land.

7. Land reserved for acquisition

Whether an environmental planning instrument or proposed environmental planning instrument referred to in section 1 makes provision in relation to the acquisition of the land by an authority of the State, as referred to in the Act, section 3.15.

No environmental planning instrument or proposed environmental planning instrument referred to in section 1 makes provision for the acquisition of the land by an authority of the State, as referred to in section 3.15 of the *Environmental Planning and Assessment Act 1979*.

8. Road widening and road realignment

Whether the land is affected by road widening or road realignment under—

(a) the *Roads Act 1993*, Part 3, Division 2, or

(b) an environmental planning instrument, or

(c) a resolution of the council.

Response:
(a) The land is not affected by road widening or road realignment under Division 2, Part 3 of the Roads Act 1993.

(b) The land is not affected by road widening or road realignment under an environmental planning instrument.

(c) The land is not affected by road widening or road realignment under a resolution of the council.

9. Flood related development controls

(1) If the land or part of the land is within the flood planning area and subject to flood related development controls.

The Council has not adopted a flood study, and as such does not have an identified *flood planning area* for the purposes of clause 5.21 of the *Mosman Local Environmental Plan 2012*. It is unknown if the land is within the flood planning area and subject to flood related development controls.

(2) If the land or part of the land is between the flood planning area and the probable maximum flood and subject to flood related development controls.

Council does not have any flood related development controls that relate to land between the flood planning area and the probable maximum flood because it has not adopted clause 5.22 in the *Mosman Local Environmental Plan 2012*.

(3) In this section—

flood planning area has the same meaning as in the Floodplain Development Manual.

Floodplain Development Manual means the *Floodplain Development Manual* (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.

probable maximum flood has the same meaning as in the Floodplain Development Manual.

10. Council and other public authority policies on hazard risk restrictions

(1) Whether any of the land is affected by an adopted policy that restricts the development of the land because of the likelihood of land slip, bush fire, tidal inundation, subsidence, acid sulfate soils, contamination, aircraft noise, salinity, coastal hazards, sea level rise or another risk, other than flooding.

(2) In this section—

adopted policy means a policy adopted—

(a) by the council, or

(b) by another public authority, if the public authority has notified the council that the policy will be included in a planning certificate issued by the council.

The land is not affected by a policy:

(a) adopted by the Council, or

(b) adopted by any other public authority and notified to the Council,

for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulfate soils, aircraft noise, salinity, coastal hazards, sea level rise or another risk, other than flooding.

The absence of such a policy does not necessarily mean that no such risk exists.

11. Bush fire prone land

(1) If any of the land is bush fire prone land, designated by the Commissioner of the NSW Rural Fire Service under the Act, section 10.3, a statement that all or some of the land is bush fire prone land.

(2) If none of the land is bush fire prone land, a statement to that effect.

The land is shown as bush fire prone on Council's Bushfire Prone Land Map as designated by the Commissioner of the NSW Rural Fire Service pursuant to section 10.3 of the Environmental Planning and Assessment Act 1979.

12. Loose-fill asbestos insulation

If the land includes residential premises, within the meaning of the *Home Building Act 1989*, Part 8, Division 1A, that are listed on the Register kept under that Division, a statement to that effect.

Council has not been notified that the land is identified on the register of residential premises under Division 1A of Part 8 of the *Home Building Act 1989*.

13. Mine subsidence

Whether the land is declared to be a mine subsidence district, within the meaning of the *Coal Mine Subsidence Compensation Act 2017*.

The land is not within a declared mine subsidence district, within the meaning of the *Coal Mine Subsidence Compensation Act 2017*.

14. Paper subdivision information

(1) The name of a development plan adopted by a relevant authority that—

(a) applies to the land, or

(b) is proposed to be subject to a ballot.

(2) The date of a subdivision order that applies to the land.

(3) Words and expressions used in this section have the same meaning as in this Regulation, Part 10 and the Act, Schedule 7.

Council is not aware of any adopted development plan or subdivision order that applies to the land.

15. Property vegetation plans

If the land is land in relation to which a property vegetation plan is approved and in force under the *Native Vegetation Act 2003,* Part 4, a statement to that effect, but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act.

Council has not been notified that the land is subject to a property vegetation plan approved under Part 4 of the *Native Vegetation Act 2003* (and that continues in force).

16. Biodiversity stewardship sites

If the land is a biodiversity stewardship site under a biodiversity stewardship agreement under the *Biodiversity Conservation Act 2016*, Part 5, a statement to that effect, but only if the council has been notified of the existence of the agreement by the Biodiversity Conservation Trust.

Council has not been notified that the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016*.

17. Biodiversity certified land

If the land is biodiversity certified land under the *Biodiversity Conservation Act 2016*, Part 8, a statement to that effect.

The land is not biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*.

18. Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land, but only if the council has been notified of the order.

Council has not been notified that the land is subject to an order under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

19. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

(1) If the *Coastal Management Act 2016* applies to the council, whether the owner, or a previous owner, of the land has given written consent to the land being subject to annual charges under the *Local Government Act 1993*, section 496B, for coastal protection services that relate to existing coastal protection works.

(2) In this section—

existing coastal protection works has the same meaning as in the *Local Government Act 1993*, section 553B.

Note—
Existing coastal protection works are works to reduce the impact of coastal hazards on land, such as seawalls, revetments, groynes and beach nourishment, that existed before 1 January 2011.

The owner (or any previous owner) of the land has not consented in writing to the land being subject to an annual charge under section 496B of the *Local Government Act 1993*, for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

20. Western Sydney Aerotropolis

Whether under *State Environmental Planning Policy (Precincts—Western Parkland City) 2021*, Chapter 4 the land is—

(a) in an ANEF or ANEC contour of 20 or greater, as referred to in that Chapter, section 4.17, or

(b) shown on the Lighting Intensity and Wind Shear Map, or

(c) shown on the Obstacle Limitation Surface Map, or

(d) in the "public safety area" on the Public Safety Area Map, or

(e) in the "3 kilometre wildlife buffer zone" or the "13 kilometre wildlife buffer zone" on the Wildlife Buffer Zone Map.

State Environmental Planning Policy (Precincts-Western Parkland City) 2021 does not apply to the land.

21. Development consent conditions for seniors housing

If *State Environmental Planning Policy (Housing) 2021*, Chapter 3, Part 5 applies to the land, any conditions of a development consent granted after 11 October 2007 in relation to the land that are of the kind set out in that Policy, section 88(2).

The land is not subject to a condition of development consent granted after 11 October 2007 relating to housing for seniors and people with a disability (State Environmental Planning Policy (Housing) 2021, Chapter 3, Part 5).

22. Site compatibility certificates and development consent conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate under *State Environmental Planning Policy (Housing) 2021*, or a former site compatibility certificate, of which the council is aware, in relation to proposed development on the land and, if there is a certificate—

(a) the period for which the certificate is current, and

(b) that a copy may be obtained from the Department.

(2) If *State Environmental Planning Policy (Housing) 2021*, Chapter 2, Part 2, Division 1 or 5 applies to the land, any conditions of a development consent in relation to the land that are of a kind referred to in that Policy, section 21(1) or 40(1).

(3) Any conditions of a development consent in relation to land that are of a kind referred to in *State Environmental Planning Policy (Affordable Rental Housing) 2009*, clause 17(1) or 38(1).

(4) In this section—

former site compatibility certificate means a site compatibility certificate issued under *State Environmental Planning Policy (Affordable Rental Housing) 2009*.

Response:
The land is not the subject of a Site Compatibility Certificate issued pursuant to clause 39 of *State Environmental Planning Policy (Housing) 2021* or clause 37 of former *State Environmental Planning Policy (Affordable Rental Housing) 2009*.

The land is not the subject of a development consent which contains conditions imposed pursuant to clause 21(1) or 40(1) of *State Environmental Planning Policy (Housing) 2021* or clause 17(1) or 38(1) of former *State Environmental Planning Policy (Affordable Rental Housing) 2009*.

The following information is provided for the purposes of Section 59(2) of the *Contaminated Land Management Act 1997*

(2) For the purposes of section 10.7 of the *Environmental Planning and Assessment Act 1979*, the following matters are prescribed in addition to any other matters, prescribed by the regulations under that section, to be specified in a certificate under that section—

(a) that the land to which the certificate relates is significantly contaminated land—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

(b) that the land to which the certificate relates is subject to a management order—if it is subject to such an order at the date when the certificate is issued,

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal—if it is the subject of such an approved proposal at the date when the certificate is issued,

(d) that the land to which the certificate relates is subject to an ongoing maintenance order—if it is subject to such an order at the date when the certificate is issued,

(e) that the land to which the certificate relates is the subject of a site audit statement—if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

Response:
(a) The land is not declared to be significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) The land is not subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) The land is not the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) The land is not subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) The land is not the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997.

Planning Certificate Section 10.7(5)

Note: When information pursuant to Section 10.7(5) is requested Council is under no obligation to furnish any of the information provided below. Your attention is drawn to Section 10.7(6) of the *Environmental Planning and Assessment Act 1979* which states that a Council shall not incur any liability in respect of any advice provided in good faith under this sub-section.

Further, in accordance with Section 10.7(5), Council's records have been checked in respect of the matters set out below. The land is:

1. **Foreshore Building Line**

Not affected by a Foreshore Building Line under Mosman Local Environmental Plan 2012.

2. **Scenic Protection Area**

Affected by a Scenic Protection Area under Mosman Local Environmental Plan 2012.

3. **Resident Parking Schemes**

Council has a number of Resident Parking Schemes which operate in various streets. Owners/occupiers of properties within areas affected by Resident Parking Schemes may be eligible for parking permits subject to certain conditions, including the payment of a fee.

4. **Tree Preservation**

The ringbarking, cutting down, topping, lopping, pruning, removing, injuring or wilful destruction of most trees is prohibited except with the written consent of Council.

5. **Natural Watercourse**

Not affected by a Watercourse under Mosman Local Environmental Plan 2012.

Notes:

While this certificate indicates the zoning of the land, it is suggested the relevant Planning Instrument be inspected online at www.planningportal.nsw.gov.au to provide an overall view of the area.

Council has made no inspection of the property for the purpose of this certificate. The purchaser should satisfy themselves that there have been no breaches of development consent.

Information on current Development Applications under assessment and determinations in Mosman can be found on Council's DA Tracker, available at www.mosman.nsw.gov.au.

Document Details and References

Receipt Date: 9/04/2024
Receipt No: 42676846440
Applicant's Reference: LS054901

Dominic Johnson
GENERAL MANAGER

Per:
Evan Matthews
11 April 2024

APPENDIX E: BOREHOLE LOGS

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH01**
sheet:	1 of 1
project no.	**754-SYDEN349808**
client:	**Archer Office Pty Ltd**
date started:	**04 Apr 2024**
principal:	
date completed:	**04 Apr 2024**
project:	**Middle Head Oval Amenities Building**
logged by:	**KT**
location:	**1110 Middle Head Road, Mosman NSW 2088**
checked by:	**JS**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA, N	Not Observed	BH01_0.0-0.1	1.4					**TOPSOIL: Sandy Silty CLAY**: medium plasticity, brown, coarse grained sand, with root fibres, some clay nodules, trace fragments of siltstone and sandstone.	<Wp	L	**FILL - TOPSOIL** No ACM / No odour observed
		BH01_0.2-0.3	2.4					**FILL: Sandy CLAY**: medium plasticity, brown, orange, coarse grained sand, sith clay nodules, trace siltstone fragments, trace bitumen tile fragments.	<Wp	L	**FILL** fabric observed
		BH01_0.4-0.5	1.2		0.5			**FILL: SAND**: dark brown, trace sandstone gravel, with bitumen fragments. 0.5 m: becoming pale brown 0.6 m: becoming dark brown	M	VS	
		BH01_0.7-0.8	0.8					**FILL: SAND**: medium to coarse grained, orange, with sandstone gravel, trace clay nodules, trace bitumen fragments.		S	
		BH01_0.9-1.0	1.2		1.0			**FILL: Sandy CLAY**: low to medium plasticity, dark grey, black, medium to coarse grained sand. 0.8 m: with red ironstone fragments from 0.9 m	D		possible hydrocarbon staining
		BH01_1.4-1.5	2.2		1.5		CH	**CLAY**: high plasticity, brown, orange with some red mottling.	<Wp	D	**NATURAL**
								Borehole BH01 terminated at 1.50 m Target depth			

method
AD auger drilling*
HA hand auger
MR mud rotary
W washbore
PT push tube
HS hollow stem
SS solid stem
SD sonic drilling
* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nill

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
WS water sample
HB hammer bouncing
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH02**
sheet:	1 of 1
project no.	**754-SYDEN349808**
client:	**Archer Office Pty Ltd**
date started:	**04 Apr 2024**
principal:	
date completed:	**04 Apr 2024**
project:	**Middle Head Oval Amenities Building**
logged by:	**KT**
location:	**1110 Middle Head Road, Mosman NSW 2088**
checked by:	**JS**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA N	Not Observed	BH02_0.0-0.1	0.4					**TOPSOIL: SAND**: medium to coarse grained, brown, trace root fibres, trace clay nodules, trace sandstone gravel.	D	VS	**FILL - TOPSOIL** No ACM / No odour / No staining observed
		BH02_0.2-0.3	0.6					**FILL: Gravelly SAND**: fine to coarse grained, pale brown, gravel comprise sandstone and red ironstone.	D	S	**FILL**
		BH02_0.4-0.5	0.8					**FILL: Gravelly SAND**: fine to medium grained, pale brown, gravel comprise sandstone and red ironstone.		VS	
					0.5			Borehole BH02 terminated at 0.50 m Refusal on ironstone			
					1.0						
					1.5						

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method
- AD auger drilling*
- HA hand auger
- MR mud rotary
- W washbore
- PT push tube
- HS hollow stem
- SS solid stem
- SD sonic drilling
- * bit shown by suffix
- e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH03**
sheet:	1 of 1
project no.	**754-SYDEN349808**
date started:	**04 Apr 2024**
date completed:	**04 Apr 2024**
logged by:	**KT**
checked by:	**JS**

client: ***Archer Office Pty Ltd***

principal:

project: ***Middle Head Oval Amenities Building***

location: ***1110 Middle Head Road, Mosman NSW 2088***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA, N	Not Observed	BH03_0.0-0.1	0.2					**TOPSOIL: SAND**: fine to medium grained, dark brown, trace root fibres.	D	S	**FILL - TOPSOIL** No ACM / No odour / No staining observed
								FILL: Gravelly CLAY: medium to high plasticity, orange, mottled red and pale grey, gravel comprise sandstone.	<Wp	D	**FILL**
		BH03_0.5-0.6	0.1		0.5		CL-Cl	**CLAY**: low to medium plasticity, pale grey, trace red.	<Wp	D	**NATURAL**
					1.0			Borehole BH03 terminated at 0.60 m Refusal on dense clay			difficulty progressing hand auger at 0.6 m
					1.5						

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method
AD auger drilling*
HA hand auger
MR mud rotary
W washbore
PT push tube
HS hollow stem
SS solid stem
SD sonic drilling
* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nill

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
WS water sample
HB hammer bouncing
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH04**
sheet:	1 of 1
project no.	**754-SYDEN349808**
client:	**Archer Office Pty Ltd**
date started:	**04 Apr 2024**
principal:	
date completed:	**04 Apr 2024**
project:	**Middle Head Oval Amenities Building**
logged by:	**KT**
location:	**1110 Middle Head Road, Mosman NSW 2088**
checked by:	**JS**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA, N	Not Observed	BH04_0.0-0.1	0.4					**TOPSOIL: SILTY SAND**: medium to coarse grained, dark brown, trace gravel (comprised blue metal).	D	S	**FILL - TOPSOIL** No ACM / No odour / No staining observed
								FILL: Gravelly SAND: fine to medium grained, brown, gravel comprised sandstone, trace bitumen fragments, terracotta tile and PVC fragments.	D	S	**FILL**
		BH04_0.4-0.5	0.8		0.5						
		BH04_(Dup1/Trip1)0.8-0.9	1.1					**FILL: Sandy CLAY**: high plasticity, dark brown, fine to medium grained sand, trace terracotta tile fragments.	<Wp	D	
		BH04_1.0-1.1	0.2		1.0		CI-CH	**CLAY**: medium to high plasticity, pale grey, mottled pale orange.	<Wp	D	**NATURAL**
					1.5			Borehole BH04 terminated at 1.10 m Target depth			

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method
AD auger drilling*
HA hand auger
MR mud rotary
W washbore
PT push tube
HS hollow stem
SS solid stem
SD sonic drilling
* bit shown by suffix e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nill

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
WS water sample
HB hammer bouncing
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH05**
sheet:	1 of 1
project no.	**754-SYDEN349808**
client:	**Archer Office Pty Ltd**
date started:	**04 Apr 2024**
principal:	
date completed:	**04 Apr 2024**
project:	**Middle Head Oval Amenities Building**
logged by:	**KT**
location:	**1110 Middle Head Road, Mosman NSW 2088**
checked by:	**JS**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA N	Not Observed	BH05_0.0-0.1	1.2					**TOPSOIL: SILTY SAND**: fine to coarse grained, dark brown, trace root fibres.	M	VS	**FILL - TOPSOIL** No ACM / No odour / No staining observed
								FILL: Gravelly SAND: fine to coarse grained, pale brown, gravel comprised sandstone, trace bitumen fragments.	D	S	**FILL**
		BH05_0.4-0.5	1.7					**FILL: Sandy CLAY**: medium plasticity, grey, mottled brown, orange, coarse grained sand.	<Wp	MD	
					0.5		Cl-CH	**CLAY**: medium to high plasticity, pale grey and orange.	<Wp	D	**NATURAL**
		BH05_0.700.8	1								
					1.0			Borehole BH05 terminated at 0.85 m Target depth			
					1.5						

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method
- AD auger drilling*
- HA hand auger
- MR mud rotary
- W washbore
- PT push tube
- HS hollow stem
- SS solid stem
- SD sonic drilling
- * bit shown by suffix
- e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH06**
sheet:	1 of 1
project no.	**754-SYDEN349808**
date started:	**04 Apr 2024**
date completed:	**04 Apr 2024**
logged by:	**KT**
checked by:	**JS**

client: ***Archer Office Pty Ltd***

principal:

project: ***Middle Head Oval Amenities Building***

location: ***1110 Middle Head Road, Mosman NSW 2088***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA, N	Not Observed	BH06_0.0-0.1	0.5					**TOPSOIL: SAND**: fine to medium grained, dark brown, trace root fibres.	W	S	**FILL - TOPSOIL** No ACM / No odour / No staining observed
								FILL: Gravelly SAND: fine to medium grained, pale brown, gravel comprised sandstone, some clay nodules.	W	S	**FILL**
		BH06_0.3-0.4	0.2								
					0.5		Cl	**CLAY**: medium plasticity, pale grey, mottled orange.	<Wp	D	**NATURAL**
		BH06_0.5-0.6	0.5								
								Borehole BH06 terminated at 0.60 m Refusal on dense clay			
					1.0						
					1.5						

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method
- AD auger drilling*
- HA hand auger
- MR mud rotary
- W washbore
- PT push tube
- HS hollow stem
- SS solid stem
- SD sonic drilling
- * bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH07**
sheet:	1 of 1
project no.	**754-SYDEN349808**
date started:	**04 Apr 2024**
date completed:	**04 Apr 2024**
logged by:	**KT**
checked by:	**JS**

client: ***Archer Office Pty Ltd***

principal:

project: ***Middle Head Oval Amenities Building***

location: ***1110 Middle Head Road, Mosman NSW 2088***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA / N	Not Observed	BH07_0.0-0.1						**TOPSOIL: SILTY SAND**: fine to medium grained, brown, low plasticity silt, trace root fibres, trace gravel comprising sandstone or ironstone.	M	VS	**FILL - TOPSOIL**
		BH07_0.15-0.25	0.1					**FILL: SILTY SAND**: fine to medium grained, pale brown / grey, low plasticity silt, trace gravel comprising ironstone, trace clay nodules, trace slag fragments.			No ACM / No staining observed
									D	VS	**FILL**
								FILL: Gravelly SILTY SAND: fine to medium grained, brown, low plasticity silt, gravel comprise sandstone, slag fragments.	D	H	strong odour at 0.2 m
					0.5			Borehole BH07 terminated at 0.25 m Refusal on hard sandstone			
					1.0						
					1.5						

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method
- AD auger drilling*
- HA hand auger
- MR mud rotary
- W washbore
- PT push tube
- HS hollow stem
- SS solid stem
- SD sonic drilling
- * bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- R refusal

soil group symbol & material description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Environmental Log - Borehole

Hole ID.	**BH08**
sheet:	1 of 1
project no.	**754-SYDEN349808**
date started:	**04 Apr 2024**
date completed:	**04 Apr 2024**
logged by:	**KT**
checked by:	**JS**

client: ***Archer Office Pty Ltd***

principal:

project: ***Middle Head Oval Amenities Building***

location: ***1110 Middle Head Road, Mosman NSW 2088***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / relative density	soil origin, structure and additional observations
HA / N	Not Observed	BH08_0.0-0.1						**TOPSOIL: SILTY SAND**: fine to medium grained, dark brown, low plasticity silt.	M	S	**FILL - TOPSOIL**
								FILL: Gravelly SAND: fine to medium grained, brown, gravel comprised sandstone and ironstone, trace clay nodules.	M	F	**FILL** No ACM / No odour / No staining observed
		BH08_0.15-0.25	0.2								
					0.5			Borehole BH08 terminated at 0.25 m Refusal on hard rock			
					1.0						
					1.5						

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method
- AD auger drilling*
- HA hand auger
- MR mud rotary
- W washbore
- PT push tube
- HS hollow stem
- SS solid stem
- SD sonic drilling
- * bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- R refusal

soil group symbol & material description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

APPENDIX F: RESULT SUMMARY TABLES

		BTEXN								Total Recoverable Hydrocarbons							Total Petroleum Hydrocarbons					Metals							
	Asbestos	Benzene	Toluene	Ethyl Benzene	m,p-Xylene	o-Xylene	total Xylenes	Naphthalene (VOC)	Total BTEX	C6 - C10	F1 (C6 - C10) less BTEX	C10 - C16	F2 C10 - C16 (minus Naphthalene)	F3 (C16 - C34)	F4 (C34 - C40)	C10 - C40 (Sum of total)	C6 - C9	C10 - C14	C15 - C28	C29 - C36	C10 - C36 (Sum of total)	Arsenic	cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
	Detect	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.1**	**0.3**	**0.5**	**0.2**	**10**	**10**	**50**	**50**	**100**	**100**	**50**	**10**	**20**	**50**	**50**	**50**	**2**	**0.4**	**2**	**5**	**5**	**0.1**	**2**	**5**
CRC Care HSL-C Recreational / Open Space	-	120	18,000	5,300	-	-	15,000	-	-	5,100	-	3,800	-	5,300	7,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRCCARE 2011, Table B4: HSL-D Intrusive Maintenance Worker - Direct Contact	-	1,100	120,000	85,000	-	-	130,000	-	-	-	82,000	62,000	-	85,000	120,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRCCARE 2011, Table B4: HSL-D Intrusive Maintenance Worker - Shallow Trench (0m <2m)		77	NL	NL			NL					NL																	
NEPM 2013 Table 1A(1) HILs Rec C Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	90	-	17,000	600	80	1,200	30,000
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space	-	-	-	-	-	-	-	170	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	410*	140*	1100	-	65*	360*
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil	-	50	85	70	-	-	105	-	-	-	180	-	120	300	2,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil	-	-	-	-	-	-	-	-	-	700	-	1,000	-	2,500	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP 2020 Ecological direct exposure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP 2020 Ecological indirect exposure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP 2020 Public open space (HIL C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Field ID	Media	Lab Report Number	Date																											
FC_01	Fibre Cement	ES2410727	04 Apr 2024	YES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GS_01	Fill	ES2410727	04 Apr 2024	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	8	<1	27	14	35	<0.1	<2	108
GS_02	Fill	ES2410727	04 Apr 2024	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	14	14	20	<0.1	2	123
BH1_0.2-0.3	Topsoil	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	6	<1	27	21	33	<0.1	11	48
BH1_0.4-0.5	Fill	ES2410727	04 Apr 2024	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1_0.9-1.0	Fill	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	11	8	18	<0.1	3	20
BH2_0.2-0.3	Fill	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	230	160	390	<10	<50	110	180	290	<5	<1	15	34	38	0.6	16	72
BH3_0.0-0.1	Topsoil	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	9	12	15	0.1	8	37
BH4_0.0-0.1	Topsoil	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	10	16	23	<0.1	6	39
BH4_0.8-0.9	Fill	ES2410727	04 Apr 2024	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	18	19	46	<0.1	11	32
DUP-1	Fill	ES2410727	04 Apr 2024	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	13	13	45	<0.1	5	28
TRIP-1	Fill	1085661	04 Apr 2024	-	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	<0.5	-	<20	<20	<50	<50	130	<100	130	<20	<20	65	92	157	2.2	<0.4	20	26	38	<0.1	32	48
BH5_0.0-0.1	Topsoil	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	8	8	14	<0.1	6	28
BH6_0.5-0.6	Fill	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	<5	<1	23	10	17	<0.1	<2	6
BH7_0.15-0.25	Fill	ES2410727	04 Apr 2024	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	56	<0.2	<10	<10	400	340	3,070	660	4,130	<10	230	2,370	1,150	3,750	<5	<1	22	37	28	0.1	17	38
BH8_0.15-0.25	Fill	ES2410727	04 Apr 2024	ND	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50	7	<1	20	15	22	0.1	7	32

* Calculated using a site specific data and the ASC NEMP EIL Calculator Spreadsheet (Appendix I)
** Canadian Soil Quality Guidelines for Environmental Health (SQGE) for benzo(a)pyrene (20 mg/kg for urban residential and public open space land use) were adopted as it is based on a similar methodology to that prescribed in Schedule B5b of the ASC NEPM 2013 (i.e., based on the species sensitivity distribution approach).
Environmental Standards
CRC Care, 2011, CRC Care HSL-C Recreational / Open Space
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Public open space (HIL C)

	Polycyclic Aromatic Hydrocarbons																					PCBs	Per and polyfluoroalkyl substances					OCP/OPPs
	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(a)pyrene TEQ calc (zero)	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)	PCBs (Sum of total)	Sum of PFAS (WA DER List)	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Sum (PFHxS + PFOS)	All other PFAS	ALL OCP/OPPs
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.1**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.05**
CRC Care HSL-C Recreational / Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,900	-	-	-	-	-	-	-	-		-
CRCCARE 2011, Table B4: HSL-D Intrusive Maintenance Worker - Direct Contact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29,000	-	-	-	-	-	-	-	-		-
CRCCARE 2011, Table B4: HSL-D Intrusive Maintenance Worker - Shallow Trench (0m <2m)																											
NEPM 2013 Table 1A(1) HILs Rec C Soil	-	-	-	-	-	-	3	3	3	-	-	-	-	-	-	-	-	-	-	300	1	-	-	-	-		-
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170	-	-	-	-	-	-	-	-		-
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil	-	-	-	-	-	20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
PFAS NEMP 2020 Ecological direct exposure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10	-		-
PFAS NEMP 2020 Ecological indirect exposure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-		-
PFAS NEMP 2020 Public open space (HIL C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1		-

Field ID	Media	Lab Report Number	Date																									
FC_01	Fibre Cement	ES2410727	04 Apr 2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GS_01	Fill	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	-	-	-	-	-	<0.05
GS_02	Fill	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
BH1_0.2-0.3	Topsoil	ES2410727	04 Apr 2024	1.2	<0.5	<0.5	<0.5	0.9	1.1	1.4	1.7	1.9	0.8	0.5	0.9	<0.5	2.1	<0.5	0.6	<0.5	0.8	1.9	10.8	-	0.0024	0.0018	<0.0002	0.0024	<LOR	-
BH1_0.4-0.5	Fill	ES2410727	04 Apr 2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1_0.9-1.0	Fill	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
BH2_0.2-0.3	Fill	ES2410727	04 Apr 2024	3.2	<0.5	<0.5	0.9	2.7	3.1	4	4.2	4.5	1.5	1.3	2.7	<0.5	6.3	<0.5	1.2	<0.5	2.6	6	31.5	<0.1	0.0016	0.0013	<0.0002	0.0016	<LOR	<0.05
BH3_0.0-0.1	Topsoil	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
BH4_0.0-0.1	Topsoil	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.5	-	-	-	-	-	-	-
BH4_0.8-0.9	Fill	ES2410727	04 Apr 2024	0.7	<0.5	<0.5	<0.5	0.5	0.7	0.8	1.1	1.4	<0.5	<0.5	0.6	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	1.3	5.1	<0.1	0.0008	0.0008	<0.0002	0.0008	<LOR	<0.05
DUP-1	Fill	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-
TRIP-1	Fill	1085661	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	0.7	0.8	1	1.3	1.6	<0.5	0.7	0.8	<0.5	1.5	<0.5	<0.5	<0.5	0.5	1.4	6.4	-	-	-	-	-	-	-
BH5_0.0-0.1	Topsoil	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
BH6_0.5-0.6	Fill	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
BH7_0.15-0.25	Fill	ES2410727	04 Apr 2024	27.7	5.8	14.1	26.1	31.5	27.7	38.2	38.2	38.2	9.9	9.5	29.4	2.4	74.1	15.4	8.4	40.5	110	73.7	506	<0.2	0.0004	0.0004	<0.0002	0.0004	<LOR	<0.25
BH8_0.15-0.25	Fill	ES2410727	04 Apr 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-

* Calculated using a site specific data and the ASC NEMP EIL Calculator Spreadsheet (Appendix I)
** Canadian Soil Quality Guidelines for Environmental Health (SQGE) for benzo(a)pyrene (20 mg/kg for urban residential and public open space land use) were adopted as it is based on a similar methodology to that prescribed in Schedule B5b of the ASC NEPM 2013 (i.e., based on the species sensitivity distribution approach).
Environmental Standards
CRC Care, 2011, CRC Care HSL-C Recreational / Open Space
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Public open space (HIL C)

Field or Interlab Duplicates

			Lab Report Number	ES2410727	ES2410727		ES2410727	1085661	
			Field ID	BH4_0.8-0.9	DUP-1		BH4_0.8-0.9	TRIP-1	
			Matrix Type	Soil	Soil		Soil	Soil	
			Date	04 Apr 2024	04 Apr 2024	RPD	04 Apr 2024	04 Apr 2024	RPD
	Unit	EQL							
Physical Parameters									
Moisture Content	%	1	16.3	15.3	6	16.3	-	-
Electrical Conductivity @ 25C (lab)	µS/cm	1	102	-	-	102	-	-
Cation Exchange Capacity (CEC)	meq/100g	0.2	6.4	-	-	6.4	-	-
Exchangeable Sodium Percent	%	0.2	<0.2	-	-	<0.2	-	-
Moisture Content (dried @ 103°C)	%	1	-	-	-	-	27	-
pH (lab)	pH Units	0.1	7.9	-	-	7.9	-	-
BTEXN									
Benzene	mg/kg	0.1	<0.2	<0.2	0	<0.2	<0.1	0
Toluene	mg/kg	0.1	<0.5	<0.5	0	<0.5	0.3	0
Ethyl Benzene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.1	0
m,p-Xylene	mg/kg	0.2	<0.5	<0.5	0	<0.5	<0.2	0
o-Xylene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.1	0
Total Xylenes	mg/kg	0.3	<0.5	<0.5	0	<0.5	<0.3	0
Naphthalene (VOC)	mg/kg	0.5	<1	<1	0	<1	<0.5	0
Total BTEX	mg/kg	0.2	<0.2	<0.2	0	<0.2	-	-
Total Recoverable Hydrocarbons									
C6 - C10	mg/kg	10	<10	<10	0	<10	<20	0
F1 (C6 - C10) less BTEX	mg/kg	10	<10	<10	0	<10	<20	0
C10 - C16	mg/kg	50	<50	<50	0	<50	<50	0
F2 C10 - C16 (minus Naphthalene)	mg/kg	50	<50	<50	0	<50	<50	0
F3 (C16 - C34)	mg/kg	100	<100	<100	0	<100	130	26
F4 (C34 - C40)	mg/kg	100	<100	<100	0	<100	<100	0
C10 - C40 (Sum of total)	mg/kg	50	<50	<50	0	<50	130	89
Total Petroleum Hydrocarbons									
C6 - C9	mg/kg	10	<10	<10	0	<10	<20	0
C10 - C14	mg/kg	20	<50	<50	0	<50	<20	0
C15 - C28	mg/kg	50	<100	<100	0	<100	65	0
C29 - C36	mg/kg	50	<100	<100	0	<100	92	0
C10 - C36 (Sum of total)	mg/kg	50	<50	<50	0	<50	157	103
Metals									
Arsenic	mg/kg	2	<5	<5	0	<5	2.2	0
Cadmium	mg/kg	0.4	<1	<1	0	<1	<0.4	0
Chromium (III+VI)	mg/kg	2	18	13	32	18	20	11
Copper	mg/kg	5	19	13	38	19	26	31
Iron	mg/kg	50	14,400	-	-	14,400	-	-
Lead	mg/kg	5	46	45	2	46	38	19
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	2	11	5	75	11	32	98
Zinc	mg/kg	5	32	28	13	32	48	40
NA									
Clay in soils <2um	%	1	13	-	-	13	-	-
DENSITY	g/cm3	0.01	2.37	-	-	2.37	-	-
Particulates									
Organic Matter_	%	0.5	3.9	-	-	3.9	-	-
Polycyclic Aromatic Hydrocarbons									
Benzo(b+j)fluoranthene	mg/kg	0.5	0.7	<0.5	33	0.7	<0.5	33
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Benz(a)anthracene	mg/kg	0.5	0.5	<0.5	0	0.5	0.7	33
Benzo(a) pyrene	mg/kg	0.5	0.7	<0.5	33	0.7	0.8	13
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.5	0.8	<0.5	46	0.8	1	22
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.5	1.1	0.6	59	1.1	1.3	17
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	1.4	1.2	15	1.4	1.6	13
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0.7	33
Chrysene	mg/kg	0.5	0.6	<0.5	18	0.6	0.8	29
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Fluoranthene	mg/kg	0.5	1.3	0.6	74	1.3	1.5	14
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0.5	0
Pyrene	mg/kg	0.5	1.3	0.6	74	1.3	1.4	7
PAHs (Sum of total)	mg/kg	0.5	5.1	1.2	124	5.1	6.4	23

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 50 (1 - 10 x EQL); 50 (10 - 10 x EQL); 30 (> 10 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Sample ID	Trip blank	Trip spike - 4	RINSATE
Date	02 Apr 2024	02 Apr 2024	04 Apr 2024
Lab Report Number	ES2410727	ES2410727	ES2410727
QC Type	Trip blank	Trip spike	Rinsate blank
Matrix Type	Soil	Soil	Water
Unit	mg/kg	Recovery %	mg/L
BTEXN			
Benzene	<0.2	100	<1
Toluene	<0.5	70	<2
Ethylbenzene	<0.5	75	<2
Xylene Total	<0.5	75	<2
Xylene (o)	<0.5	76	<2
Xylene (m & p)	<0.5	75	<2
Naphthalene (VOC)	<1	100	<5
Total Petroleum Hydrocarbons			
C6 - C9	<10	89	<20
C10 - C14	-	-	-
C15 - C28	-	-	-
C29 - C36	-	-	-
Total Recoverable Hydrocarbons			
F1 (C6 - C10)	<10	89	<20
F1 (C6 - C10) less BTEX	<10	-	<20
F2 (C10 - C16)	-	-	-
F2 C10 - C16 (minus Naphthalene)	-	-	-
F3 (C16 - C34)	-	-	-
F4 (C34 - C40)	-	-	-
C10 - C40 (Sum of total)	-	-	-
Heavy Metals			
Arsenic	-	-	<1
Cadmium	-	-	<0.1
Chromium (III+VI)	-	-	<1
Copper	-	-	<1
Lead	-	-	<1
Mercury	-	-	<0.1
Nickel	-	-	<1
Zinc	-	-	<5

APPENDIX G: CALIBRATION CERTIFICATE

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-119099

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm	-	-
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		100ppm Isobutylene	NATA	SY-I13		99.4 ppm

Calibrated by: **Christopher Nicdao**

Calibration date: **28/03/2024**

Next calibration due: **27/04/2024**

APPENDIX H: ANALYTICAL LABORATORY REPORTS

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

TETRA TECH COFFEY

Consigning Office: Tetra Tech Coffey, Chatswood, Level 20, Tower B, 799 Pacific Highway

Report Results to: Jessie Sixsmith Mobile: 0434 851 353 Email: jessie.sixsmith@tetratech.com

Invoices to: Phone: Email:

Project No: 754-SYDEN349808 Task No: Field work

Project Name: Middle Head Pavilion Laboratory: ALS Environmental

Sampler's Name: Katie Trevor Project Manager: Jessie Sixsmith

Quote number (if different to current quoted prices):

Special Instructions:

Analysis Request Section

Lab Batch Ref	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	S26 (TRH/BTEXN/PAH/8 Metals)	S13 (OC/OP Pesticides, PCBs	PFAS - Full Suite (28 Analytes)	Asbestos	P22 (Iron, clay content, CEC, TOC, pH)	S18 (TRH/BTEXN)	NOTES
1	BH1_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
2	BH1_0.2-0.3	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X		X	X			
3	BH1_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard				X			
4	BH1_0.7-0.8	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
5	BH1_0.9-1.0	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
6	BH1_1.4-1.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
7	BH2_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
8	BH2_0.2-0.3	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X	X	X			
9	BH2_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
10	BH3_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
11	BH3_0.5-0.6	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
12	BH4_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
13	BH4_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
14	BH4_0.8-0.9	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X	X		X		
15	BH4_1.0-1.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
16	DUP-1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X						

Environmental Division Sydney
Work Order Reference
ES2410727

Telephone : + 61-2-8784 8555

RELINQUISHED BY

Name: Katie Trevor Date: 4/04/2024
Coffey Time:

Name: Date:
Company: Time:

RECEIVED BY

Name: Dom. Date: 4/4/24
Company: ALS Time: 3:15pm

Name: Thanh L Date: 4/4/24
Company: ALS Time: 1900

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☑
All Documentation is in Proper Order ☐
Samples Received Properly Chilled ☐
Lab. Ref/Batch No. 19.8, 4.7, 0.4 EC

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

Chain of custody
Issued: 5 April 2022
UNCONTROLLED WHEN PRINTED

9/8/24 12:20

1085661

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

TETRA TECH COFFEY

Consigning Office:	Tetra Tech Coffey, Chatswood, Level 20, Tower B, 799 Pacific Highway				
Report Results to:	Jessie Sixsmith	Mobile:	0434 851 353	Email:	jessie.sixsmith@tetratech.com
Invoices to:	coffey admin	Phone:		Email:	

Project No:	754-SYDEN349808	Task No:	Field work
Project Name:	Middle Head Pavilion	Laboratory:	ALS Environmental
Sampler's Name:	Katie Trevor	Project Manager:	Jessie Sixsmith
Quote number (if different to current quoted prices):			
Special Instructions:			

Lab Batch Ref	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Analysis Request Section: S26 (TRH/BTEXN/PAH/8 Metals)	S13 (OC/OP Pesticides, PCBs	PFAS - Full Suite (28 Analytes)	Asbestos	P22 (Iron, clay content, CEC, TOC, pH)	S18 (TRH/BTEXN)	NOTES
—	TRIP-1	4/04/2024	AM/PM	Soil	J	Standard	X						
17	BH5_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			Send to Eurofins
18	BH5_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
19	BH5_0.7-0.8	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
20	BH6_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
21	BH6_0.3-0.4	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
22	BH6_0.5-0.6	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
23	BH7_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard				X			
24	BH7_0.15-0.25	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X	X				
25	BH8_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
26	BH8_0.15-0.25	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
27	FC_01	4/04/2024	AM/PM	Soil	Z	Standard				X			
28	GS_01	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X		X			
29	GS_02	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X						
30+31	Trip blank and Spike — 4	2/04/2024	AM/PM	Soil	2x V each	Standard						X	
32	Rinsate	4/04/2024	AM/PM	Water	G, 2xV	Standard	X						
33	TSC — 4												

RELINQUISHED BY		RECEIVED BY	
Name: Katie Trevor	Date: 4/04/2024	Name:	Date:
Company: Coffey	Time:	Company:	Time:
Name:	Date: →	Name:	Date:
Company:	Time:	Company:	Time:

Sample Receipt Advice: (Lab Use Only)

- All Samples Recieved in Good Condition ☐
- All Documentation is in Proper Order ☐
- Samples Received Properly Chilled ☐
- Lab. Ref/Batch No. ☐

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative

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www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

Eurofins ARL Pty Ltd

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NATA# 2561
Site# 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Asb)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Tetra Tech Coffey Environment Pty Ltd NSW
Contact name:	Jessie Sixsmith
Project name:	MIDDLE HEAD PAVILION
Project ID:	754-SYDEN349808
Turnaround time:	5 Day
Date/Time received	Apr 9, 2024 12:20 PM
Eurofins reference	1085661

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 4 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✗	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Asim Khan on phone : or by email: AsimKhan@eurofins.com

Results will be delivered electronically via email to Jessie Sixsmith - jessie.sixsmith@tetratech.com.

Note: A copy of these results will also be delivered to the general Tetra Tech Coffey Environment Pty Ltd NSW email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Tetra Tech Coffey Environment Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MIDDLE HEAD PAVILION
Project ID: 754-SYDEN349808

Order No.:
Report #: 1085661
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Apr 9, 2024 12:20 PM
Due: Apr 16, 2024
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Moisture Set	Eurofins Suite B7
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TRIP-1	Apr 04, 2024		Soil	S24-Ap0020336	X	X
Test Counts						1	1

Tetra Tech Coffey Environment Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Jessie Sixsmith**

Report **1085661-S**
Project name MIDDLE HEAD PAVILION
Project ID 754-SYDEN349808
Received Date Apr 09, 2024

Client Sample ID			**TRIP-1**
Sample Matrix			**Soil**
Eurofins Sample No.			**S24-Ap0020336**
Date Sampled			**Apr 04, 2024**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	65
TRH C29-C36	50	mg/kg	92
TRH C10-C36 (Total)	50	mg/kg	157
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	130
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	130
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	0.3
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.0
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.3
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.6
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	0.7
Benzo(a)pyrene	0.5	mg/kg	0.8
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	0.7
Chrysene	0.5	mg/kg	0.8

Client Sample ID			TRIP-1
Sample Matrix			Soil
Eurofins Sample No.			S24-Ap0020336
Date Sampled			Apr 04, 2024
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	1.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	0.5
Pyrene	0.5	mg/kg	1.4
Total PAH*	0.5	mg/kg	6.4
2-Fluorobiphenyl (surr.)	1	%	96
p-Terphenyl-d14 (surr.)	1	%	INT
Heavy Metals			
Arsenic	2	mg/kg	2.2
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	20
Copper	5	mg/kg	26
Lead	5	mg/kg	38
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	32
Zinc	5	mg/kg	48
Sample Properties			
% Moisture	1	%	27

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Apr 09, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Apr 09, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Apr 09, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Apr 09, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Sydney	Apr 09, 2024	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Apr 09, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Apr 09, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			

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web: www.eurofins.com.au
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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Tetra Tech Coffey Environment Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
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NSW 2067

Project Name: MIDDLE HEAD PAVILION
Project ID: 754-SYDEN349808

Order No.:
Report #: 1085661
Phone: +61 2 9406 1000
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Received: Apr 9, 2024 12:20 PM
Due: Apr 16, 2024
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Moisture Set	Eurofins Suite B7
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TRIP-1	Apr 04, 2024		Soil	S24-Ap0020336	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

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

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

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

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

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

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	105			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	89			70-130	Pass	
TRH C6-C10	%	104			70-130	Pass	
TRH >C10-C16	%	88			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	109			70-130	Pass	
Toluene	%	108			70-130	Pass	
Ethylbenzene	%	110			70-130	Pass	
m&p-Xylenes	%	111			70-130	Pass	
o-Xylene	%	111			70-130	Pass	
Xylenes - Total*	%	111			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	85			70-130	Pass	
Acenaphthylene	%	85			70-130	Pass	
Anthracene	%	95			70-130	Pass	
Benz(a)anthracene	%	84			70-130	Pass	
Benzo(a)pyrene	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	%	78			70-130	Pass	
Benzo(g.h.i)perylene	%	85			70-130	Pass	
Benzo(k)fluoranthene	%	93			70-130	Pass	
Chrysene	%	85			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	93			70-130	Pass	
Fluorene	%	89			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	83			70-130	Pass	
Naphthalene	%	85			70-130	Pass	
Phenanthrene	%	92			70-130	Pass	
Pyrene	%	93			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	94			80-120	Pass	
Cadmium	%	99			80-120	Pass	
Chromium	%	95			80-120	Pass	
Copper	%	97			80-120	Pass	
Lead	%	102			80-120	Pass	
Mercury	%	108			80-120	Pass	
Nickel	%	103			80-120	Pass	
Zinc	%	101			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S24-Ap0018674	NCP	%	101			70-130	Pass	
TRH C10-C14	R24-Ap0015651	NCP	%	110			70-130	Pass	
TRH C6-C10	S24-Ap0018674	NCP	%	102			70-130	Pass	
TRH >C10-C16	R24-Ap0015651	NCP	%	105			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S24-Ap0018674	NCP	%	105			70-130	Pass	
Toluene	S24-Ap0018674	NCP	%	105			70-130	Pass	
Ethylbenzene	S24-Ap0018674	NCP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	S24-Ap0018674	NCP	%	104			70-130	Pass	
o-Xylene	S24-Ap0018674	NCP	%	111			70-130	Pass	
Xylenes - Total*	S24-Ap0018674	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S24-Ap0019440	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S24-Ap0025692	NCP	%	93			70-130	Pass	
Acenaphthylene	S24-Ap0025692	NCP	%	92			70-130	Pass	
Anthracene	S24-Ap0025692	NCP	%	96			70-130	Pass	
Benz(a)anthracene	S24-Ap0025692	NCP	%	78			70-130	Pass	
Benzo(a)pyrene	S24-Ap0025692	NCP	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	S24-Ap0025692	NCP	%	80			70-130	Pass	
Benzo(g.h.i)perylene	S24-Ap0025692	NCP	%	86			70-130	Pass	
Benzo(k)fluoranthene	S24-Ap0025692	NCP	%	103			70-130	Pass	
Chrysene	S24-Ap0025692	NCP	%	98			70-130	Pass	
Dibenz(a.h)anthracene	S24-Ap0025692	NCP	%	83			70-130	Pass	
Fluoranthene	S24-Ap0025692	NCP	%	98			70-130	Pass	
Fluorene	S24-Ap0025692	NCP	%	98			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S24-Ap0025692	NCP	%	81			70-130	Pass	
Naphthalene	S24-Ap0025692	NCP	%	96			70-130	Pass	
Phenanthrene	S24-Ap0025692	NCP	%	89			70-130	Pass	
Pyrene	S24-Ap0025692	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	R24-Ap0015657	NCP	%	92			75-125	Pass	
Cadmium	R24-Ap0015657	NCP	%	98			75-125	Pass	
Chromium	R24-Ap0015657	NCP	%	95			75-125	Pass	
Copper	R24-Ap0015657	NCP	%	105			75-125	Pass	
Lead	S24-Ap0013106	NCP	%	106			75-125	Pass	
Mercury	R24-Ap0015657	NCP	%	98			75-125	Pass	
Nickel	R24-Ap0015657	NCP	%	96			75-125	Pass	
Zinc	S24-Ap0013106	NCP	%	95			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S24-Ap0013429	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S24-Ap0021055	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S24-Ap0021055	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S24-Ap0021055	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C6-C10	S24-Ap0013429	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S24-Ap0021055	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S24-Ap0021055	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S24-Ap0021055	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S24-Ap0014784	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S24-Ap0014784	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S24-Ap0014784	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S24-Ap0014784	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S24-Ap0014784	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S24-Ap0014784	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S24-Ap0014784	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S24-Ap0016604	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Ap0020050	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S24-Ap0020050	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S24-Ap0020050	NCP	mg/kg	5.4	5.2	3.8	30%	Pass	
Copper	S24-Ap0020050	NCP	mg/kg	7.0	6.7	4.9	30%	Pass	
Lead	S24-Ap0020050	NCP	mg/kg	8.0	7.2	11	30%	Pass	
Mercury	S24-Ap0020050	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S24-Ap0020050	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S24-Ap0020050	NCP	mg/kg	20	18	9.4	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S24-Ap0020605	NCP	%	18	18	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Asim Khan	Analytical Services Manager
Fang Yee Tan	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2410727**	Page	: 1 of 30
Client	: **TETRA TECH COFFEY PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JESSIE SIXSMITH	Contact	: Jason Dighton
Address	: LEVEL 19, TOWER B- CITADEL TOWER 799 PACIFIC HIGHWAY CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 754-SYDEN349808 Middle Head Pavilion	Date Samples Received	: 04-Apr-2024 15:15
Order number	: ----	Date Analysis Commenced	: 09-Apr-2024
C-O-C number	: ----	Issue Date	: 15-Apr-2024 17:44
Sampler	: Katie Trevor		
Site	:		
Quote number	: EN/000		
No. of samples received	: 33		
No. of samples analysed	: 19		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
John Williams	Lab Technician	Newcastle - Asbestos, Mayfield West, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP071: Results of sample BH7_0.15-0.25 have been confirmed by re-extraction and re-analysis.
- **EA200 Legend**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Analysis of asbestos from swabs and tapes is not covered under the current scope of NATA accreditation.
- EP080: Particular sample required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- EP068: Particular samples required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EP066 : Particular samples required dilution due to sample matrix . LOR values have been adjusted accordingly.
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2

- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
- EA200: N/A - Not Applicable
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration or as per USEPA 1633 limits where LISTED. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS and also conform to QSM 5.4 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH1_0.2-0.3	BH1_0.4-0.5	BH1_0.9-1.0	BH2_0.2-0.3	BH3_0.0-0.1
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-002	ES2410727-003	ES2410727-005	ES2410727-008	ES2410727-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	11.8	----	14.4	7.2	15.0
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	Yes	Yes	No	No	No
Sample weight (dry)	----	0.01	g	513	651	484	753	440
APPROVED IDENTIFIER:	----	-	--	J. PAGE	J. PAGE	J. PAGE	J. PAGE	J. PAGE
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	----	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	27	----	11	15	9
Copper	7440-50-8	5	mg/kg	21	----	8	34	12
Lead	7439-92-1	5	mg/kg	33	----	18	38	15
Nickel	7440-02-0	2	mg/kg	11	----	3	16	8
Zinc	7440-66-6	5	mg/kg	48	----	20	72	37
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	0.6	0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1_0.2-0.3	BH1_0.4-0.5	BH1_0.9-1.0	BH2_0.2-0.3	BH3_0.0-0.1
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-002	ES2410727-003	ES2410727-005	ES2410727-008	ES2410727-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	<0.05	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg		----	----	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	<0.05	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		----	----	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	<0.2	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		----	----	----	<0.05	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-29-3	0.05	mg/kg		----	----	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg		----	----	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH1_0.2-0.3	BH1_0.4-0.5	BH1_0.9-1.0	BH2_0.2-0.3	BH3_0.0-0.1
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-002	ES2410727-003	ES2410727-005	ES2410727-008	ES2410727-010
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	----	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	----	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	----	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg	----	----	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	**0.8**	----	<0.5	**2.6**	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	**0.9**	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	**2.1**	----	<0.5	**6.3**	<0.5
Pyrene	129-00-0	0.5	mg/kg	**1.9**	----	<0.5	**6.0**	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	**0.9**	----	<0.5	**2.7**	<0.5
Chrysene	218-01-9	0.5	mg/kg	**0.9**	----	<0.5	**2.7**	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	**1.2**	----	<0.5	**3.2**	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	**0.5**	----	<0.5	**1.3**	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1_0.2-0.3	BH1_0.4-0.5	BH1_0.9-1.0	BH2_0.2-0.3	BH3_0.0-0.1
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-002	ES2410727-003	ES2410727-005	ES2410727-008	ES2410727-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**1.1**	----	<0.5	**3.1**	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**0.6**	----	<0.5	**1.2**	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**0.8**	----	<0.5	**1.5**	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		**10.8**	----	<0.5	**31.5**	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		**1.4**	----	<0.5	**4.0**	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**1.7**	----	**0.6**	**4.2**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.9**	----	**1.2**	**4.5**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	**110**	<100
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	**180**	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	<50	**290**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	----	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	----	<100	**230**	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	----	<100	**160**	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	<50	**390**	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1_0.2-0.3	BH1_0.4-0.5	BH1_0.9-1.0	BH2_0.2-0.3	BH3_0.0-0.1
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-002	ES2410727-003	ES2410727-005	ES2410727-008	ES2410727-010
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0006**	----	----	**0.0003**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0018**	----	----	**0.0013**	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluoropropane sulfonic acid (PFPrS)	----	0.0005	mg/kg		<0.0005	----	----	<0.0005	----
Perfluorononane sulfonic acid (PFNS)	----	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	<0.0002	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH1_0.2-0.3	BH1_0.4-0.5	BH1_0.9-1.0	BH2_0.2-0.3	BH3_0.0-0.1
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-002	ES2410727-003	ES2410727-005	ES2410727-008	ES2410727-010
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	<0.0005	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0024**	----	----	**0.0016**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH1_0.2-0.3	BH1_0.4-0.5	BH1_0.9-1.0	BH2_0.2-0.3	BH3_0.0-0.1
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-002	ES2410727-003	ES2410727-005	ES2410727-008	ES2410727-010
				Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued								
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0024**	----	----	**0.0016**	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0024**	----	----	**0.0016**	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	**116**	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	----	**120**	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	----	**100**	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**82.5**	----	**85.2**	**82.3**	**81.3**
2-Chlorophenol-D4	93951-73-6	0.5	%	**82.6**	----	**84.9**	**83.9**	**82.6**
2.4.6-Tribromophenol	118-79-6	0.5	%	**61.0**	----	**69.2**	**74.5**	**72.0**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**83.4**	----	**81.0**	**78.9**	**88.3**
Anthracene-d10	1719-06-8	0.5	%	**81.6**	----	**81.8**	**85.5**	**82.4**
4-Terphenyl-d14	1718-51-0	0.5	%	**81.3**	----	**81.3**	**81.4**	**85.0**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**81.1**	----	**79.7**	**82.4**	**81.6**
Toluene-D8	2037-26-5	0.2	%	**83.6**	----	**84.3**	**88.7**	**87.9**
4-Bromofluorobenzene	460-00-4	0.2	%	**81.0**	----	**82.5**	**86.9**	**88.4**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**101**	----	----	**96.7**	----
13C8-PFOA	----	0.0002	%	**97.4**	----	----	**104**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	7.2	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	----	7.9	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	102	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	11.9	16.3	15.3	16.0	19.5
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	13	----	----	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	2.37	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	No	No
Asbestos (Trace)	1332-21-4	-	-	No	----	----	No	No
Asbestos Type	1332-21-4	-	--	-	----	----	-	-
Synthetic Mineral Fibre	----	-	--	No	----	----	No	No
Organic Fibre	----	-	--	No	----	----	No	No
Sample weight (dry)	----	0.01	g	393	----	----	490	447
APPROVED IDENTIFIER:	----	-	--	J. PAGE	----	----	J. PAGE	J. PAGE
ED006: Exchangeable Cations on Alkaline Soils								
ø Exchangeable Calcium	----	0.2	meq/100g	----	5.6	----	----	----
ø Exchangeable Magnesium	----	0.2	meq/100g	----	0.8	----	----	----
ø Exchangeable Potassium	----	0.2	meq/100g	----	<0.2	----	----	----
ø Exchangeable Sodium	----	0.2	meq/100g	----	<0.2	----	----	----
ø Cation Exchange Capacity	----	0.2	meq/100g	----	6.4	----	----	----
ø Exchangeable Sodium Percent	----	0.2	%	----	<0.2	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Iron	7439-89-6	0.005	%	----	**1.44**	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**10**	**18**	**13**	**8**	**23**
Copper	7440-50-8	5	mg/kg	**16**	**19**	**13**	**8**	**10**
Lead	7439-92-1	5	mg/kg	**23**	**46**	**45**	**14**	**17**
Nickel	7440-02-0	2	mg/kg	**6**	**11**	**5**	**6**	<2
Zinc	7440-66-6	5	mg/kg	**39**	**32**	**28**	**28**	**6**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	**3.9**	----	----	----
Total Organic Carbon	----	0.5	%	----	**2.3**	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	----	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-29-3	0.05	mg/kg	----	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	**1.3**	**0.6**	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		**0.5**	**1.3**	**0.6**	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	**0.5**	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	**0.6**	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	**0.7**	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	**0.7**	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**0.5**	**5.1**	**1.2**	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	**0.8**	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**1.1**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.4**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	----	**0.0008**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluoropropane sulfonic acid (PFPrS)	----	0.0005	mg/kg	----	<0.0005	----	----	----
Perfluorononane sulfonic acid (PFNS)	----	0.0002	mg/kg	----	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	----	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	----	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	----	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	----	<0.0002	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		----	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		----	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		----	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		----	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		----	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		----	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		----	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		----	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		----	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		----	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		----	**0.0008**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		----	**0.0008**	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		----	**0.0008**	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	**105**	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**109**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH4_0.0-0.1	BH4_0.8-0.9	DUP-1	BH5_0.0-0.1	BH6_0.5-0.6
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-012	ES2410727-014	ES2410727-016	ES2410727-017	ES2410727-022
				Result	Result	Result	Result	Result
EP068T: Organophosphorus Pesticide Surrogate - Continued								
DEF	78-48-8	0.05	%	----	110	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	91.1	77.3	80.0	83.8	83.6
2-Chlorophenol-D4	93951-73-6	0.5	%	84.4	73.5	80.9	84.3	83.2
2.4.6-Tribromophenol	118-79-6	0.5	%	75.2	70.0	61.2	76.4	69.7
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	80.4	75.5	80.9	87.8	80.0
Anthracene-d10	1719-06-8	0.5	%	82.2	83.4	84.6	82.2	82.6
4-Terphenyl-d14	1718-51-0	0.5	%	83.9	79.2	80.1	87.8	80.7
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	86.1	75.4	82.0	76.3	73.4
Toluene-D8	2037-26-5	0.2	%	95.4	84.2	91.4	83.1	85.2
4-Bromofluorobenzene	460-00-4	0.2	%	92.2	84.0	85.2	82.5	84.4
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	----	99.0	----	----	----
13C8-PFOA	----	0.0002	%	----	102	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH7_0.15-0.25	BH8_0.15-0.25	GS_01	GS_02	Trip blank
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	02-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-024	ES2410727-026	ES2410727-028	ES2410727-029	ES2410727-030
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**5.4**	**15.0**	**8.5**	**6.7**	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	**No**	----	----	----
Asbestos (Trace)	1332-21-4	-	-	----	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	----	**-**	----	----	----
Synthetic Mineral Fibre	----	-	--	----	**No**	----	----	----
Organic Fibre	----	-	--	----	**No**	----	----	----
Sample weight (dry)	----	0.01	g	----	**667**	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	**J. PAGE**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**7**	**8**	<5	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	**22**	**20**	**27**	**14**	----
Copper	7440-50-8	5	mg/kg	**37**	**15**	**14**	**14**	----
Lead	7439-92-1	5	mg/kg	**28**	**22**	**35**	**20**	----
Nickel	7440-02-0	2	mg/kg	**17**	**7**	<2	**2**	----
Zinc	7440-66-6	5	mg/kg	**38**	**32**	**108**	**123**	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.1**	**0.1**	<0.1	<0.1	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.2	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.25	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.25	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.25	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.25	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.25	----	<0.05	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH7_0.15-0.25	BH8_0.15-0.25	GS_01	GS_02	Trip blank
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	02-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-024	ES2410727-026	ES2410727-028	ES2410727-029	ES2410727-030
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Heptachlor	76-44-8	0.05	mg/kg		<0.25	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.25	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.25	----	<0.05	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg		<0.08	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.25	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.25	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.25	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.25	----	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.25	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		<0.25	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.25	----	<0.05	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.15	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.25	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.25	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.25	----	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<1.0	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.25	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<1.0	----	<0.2	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.08	----	<0.05	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-29-2	0.05	mg/kg		<0.08	----	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.25	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.25	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<1.0	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.25	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.25	----	<0.05	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH7_0.15-0.25	BH8_0.15-0.25	GS_01	GS_02	Trip blank
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	02-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-024	ES2410727-026	ES2410727-028	ES2410727-029	ES2410727-030
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.25	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<1.0	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg		<0.25	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.25	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.25	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg		<1.0	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.25	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.25	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.25	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.25	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.25	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg		<0.25	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.25	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.25	----	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		**40.5**	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		**14.1**	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		**5.8**	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		**15.4**	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		**110**	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		**26.1**	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		**74.1**	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		**73.7**	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**31.5**	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		**29.4**	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**27.7**	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		**9.5**	<0.5	<0.5	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH7_0.15-0.25	BH8_0.15-0.25	GS_01	GS_02	Trip blank
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	02-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-024	ES2410727-026	ES2410727-028	ES2410727-029	ES2410727-030
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**27.7**	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**8.4**	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		**2.4**	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**9.9**	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**506**	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**38.2**	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**38.2**	**0.6**	**0.6**	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**38.2**	**1.2**	**1.2**	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		**230**	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		**2370**	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		**1150**	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**3750**	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		**400**	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		**3070**	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		**660**	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**4130**	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		**340**	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.5	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH7_0.15-0.25	BH8_0.15-0.25	GS_01	GS_02	Trip blank
				Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	02-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2410727-024	ES2410727-026	ES2410727-028	ES2410727-029	ES2410727-030
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		**56**	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0004**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropropane sulfonic acid (PFPrS)	----	0.0005	mg/kg		<0.0005	----	----	----	----
Perfluorononane sulfonic acid (PFNS)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH7_0.15-0.25	BH8_0.15-0.25	GS_01	GS_02	Trip blank
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	02-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-024	ES2410727-026	ES2410727-028	ES2410727-029	ES2410727-030
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0004**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH7_0.15-0.25	BH8_0.15-0.25	GS_01	GS_02	Trip blank
			Sampling date / time	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	04-Apr-2024 00:00	02-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2410727-024	ES2410727-026	ES2410727-028	ES2410727-029	ES2410727-030
				Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued								
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0004**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0004**	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**85.2**	----	**117**	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**91.4**	----	**96.1**	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**81.2**	----	**98.2**	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**88.2**	**86.3**	**80.6**	**96.4**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**86.4**	**83.3**	**81.3**	**90.8**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**86.5**	**82.5**	**76.5**	**71.6**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**85.1**	**87.3**	**77.1**	**80.8**	----
Anthracene-d10	1719-06-8	0.5	%	**78.3**	**83.5**	**82.9**	**85.0**	----
4-Terphenyl-d14	1718-51-0	0.5	%	**87.9**	**93.3**	**80.5**	**82.8**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**106**	**82.9**	**78.5**	**83.1**	**78.8**
Toluene-D8	2037-26-5	0.2	%	**116**	**94.5**	**90.7**	**88.2**	**82.5**
4-Bromofluorobenzene	460-00-4	0.2	%	**127**	**107**	**84.9**	**87.2**	**82.6**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**96.8**	----	----	----	----
13C8-PFOA	----	0.0002	%	**97.2**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	Trip spike - 4	TSC - 4	----	----	----
			Sampling date / time	02-Apr-2024 00:00	02-Apr-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2410727-031	ES2410727-033	--------	--------	--------
				Result	Result	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	**3.0**	**4.3**	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	**4.1**	**5.5**	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	**3.6**	**4.8**	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	**1.3**	**1.7**	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	**12.0**	**16.3**	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg	**4.9**	**6.5**	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**72.0**	**75.9**	----	----	----
Toluene-D8	2037-26-5	0.2	%	**79.6**	**87.4**	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**80.8**	**86.5**	----	----	----

Analytical Results

Sub-Matrix: SOLID (Matrix: SOLID)			Sample ID	FC_01	----	----	----	----
			Sampling date / time	04-Apr-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2410727-027	--------	--------	--------	--------
				Result	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	**Yes**	----	----	----	----
Asbestos Type	1332-21-4	-	--	**Ch + Am**	----	----	----	----
Asbestos (Trace)	1332-21-4	-	-	**N/A**	----	----	----	----
Sample weight (dry)	----	0.01	g	**5.49**	----	----	----	----
Synthetic Mineral Fibre	----	-	-	**No**	----	----	----	----
Organic Fibre	----	-	-	**No**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	**J. WILLIAMS**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Rinsate	----	----	----	----
				Sampling date / time	04-Apr-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2410727-032	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**110**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**117**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**106**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	BH1_0.2-0.3 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH1_0.4-0.5 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH1_0.9-1.0 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH2_0.2-0.3 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH3_0.0-0.1 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH4_0.0-0.1 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH5_0.0-0.1 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH6_0.5-0.6 - 04-Apr-2024 00:00	Soil sample.
EA200: Description	BH8_0.15-0.25 - 04-Apr-2024 00:00	Soil sample.

Sub-Matrix: **SOLID**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	FC_01 - 04-Apr-2024 00:00	One piece of asbestos cement sheeting approximately 30 x 20 x 5mm.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

(SOLID) EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

QUALITY CONTROL REPORT

Work Order	: **ES2410727**	Page	: 1 of 19
Client	: **TETRA TECH COFFEY PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JESSIE SIXSMITH	Contact	: Jason Dighton
Address	: LEVEL 19, TOWER B- CITADEL TOWER 799 PACIFIC HIGHWAY CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 754-SYDEN349808 Middle Head Pavilion	Date Samples Received	: 04-Apr-2024
Order number	: ----	Date Analysis Commenced	: 09-Apr-2024
C-O-C number	: ----	Issue Date	: 15-Apr-2024
Sampler	: Katie Trevor		
Site	:		
Quote number	: EN/000		
No. of samples received	: 33		
No. of samples analysed	: 19		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5714265)									
ES2410727-002	BH1_0.2-0.3	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	27	25	7.1	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	11	10	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	21	26	20.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	33	30	10.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	48	50	3.8	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	20200	18800	7.5	0% - 20%
ES2410727-026	BH8_0.15-0.25	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	20	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	12	18.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	23	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	32	29	8.2	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	19900	17400	13.2	0% - 20%
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 5721368)									
ES2410727-014	BH4_0.8-0.9	EA001: pH (CaCl2)	----	0.1	pH Unit	7.2	7.3	0.0	0% - 20%
EA002: pH 1:5 (Soils) (QC Lot: 5714270)									
ES2410727-014	BH4_0.8-0.9	EA002: pH Value	----	0.1	pH Unit	7.9	7.9	0.0	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA002: pH 1:5 (Soils) (QC Lot: 5714270) - continued									
EW2401607-017	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.3	5.4	2.2	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 5714271)									
ES2410944-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	102	107	5.1	0% - 20%
ES2410727-014	BH4_0.8-0.9	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	102	114	11.3	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5714273)									
ES2410727-008	BH2_0.2-0.3	EA055: Moisture Content	----	0.1 (1.0)*	%	7.2	7.6	5.7	No Limit
ES2410733-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	6.1	6.1	0.0	No Limit
ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 5719919)									
ES2410727-014	BH4_0.8-0.9	ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	<0.2	0.0	No Limit
		ED006: Exchangeable Calcium	----	0.2	meq/100g	5.6	5.9	4.6	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	0.8	0.8	0.0	No Limit
		ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	0.0	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	<0.2	0.0	No Limit
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	6.4	6.7	4.8	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5714264)									
ES2410727-002	BH1_0.2-0.3	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2410727-026	BH8_0.15-0.25	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.0	No Limit
EP004: Organic Matter (QC Lot: 5721211)									
EM2404846-015	Anonymous	EP004: Organic Matter	----	0.5	%	0.6	0.5	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 5713748)									
ES2410727-008	BH2_0.2-0.3	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 5713745)									
ES2410727-008	BH2_0.2-0.3	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 5713745) - continued									
ES2410727-008	BH2_0.2-0.3	EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 5713745)									
ES2410727-008	BH2_0.2-0.3	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5713481)									
ES2411201-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.6	0.8	18.9	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.6	0.7	18.9	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5713481) - continued									
ES2411201-003	Anonymous	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.2	1.5	22.2	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2411201-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5713747)									
ES2410727-008	BH2_0.2-0.3	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.6	2.0	24.7	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.9	0.8	17.7	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5713747) - continued									
ES2410727-008	BH2_0.2-0.3	EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	6.3	5.2	18.9	0% - 50%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	6.0	5.1	16.5	0% - 50%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	2.7	2.3	16.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	2.7	2.1	23.2	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	3.2	2.7	14.8	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.3	1.2	10.3	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	3.1	2.7	12.7	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.2	1.1	13.5	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.5	1.3	13.3	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	31.5	26.5	17.2	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	4.0	3.5	13.9	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5712834)									
ES2410727-002	BH1_0.2-0.3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2410727-026	BH8_0.15-0.25	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5713482)									
ES2411201-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2411201-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5713746)									
ES2410727-008	BH2_0.2-0.3	EP071: C15 - C28 Fraction	----	100	mg/kg	110	120	10.5	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	180	150	14.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5712834)									
ES2410727-002	BH1_0.2-0.3	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2410727-026	BH8_0.15-0.25	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5713482)									
ES2411201-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2411201-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5713482) - continued									
ES2411201-001	Anonymous	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5713746)									
ES2410727-008	BH2_0.2-0.3	EP071: >C16 - C34 Fraction	----	100	mg/kg	230	220	7.3	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	160	140	9.6	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 5712834)									
ES2410727-002	BH1_0.2-0.3	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2410727-026	BH8_0.15-0.25	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5716773)									
EB2411401-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0034	0.0032	6.9	0% - 50%
		EP231X: Perfluorononane sulfonic acid (PFNS)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropropane sulfonic acid (PFPrS)	----	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5716773)									
EB2411401-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0011	0.0009	17.9	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0006	0.0005	18.8	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0005	0.0004	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5716773) - continued									
EB2411401-001	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5716773)									
EB2411401-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5716773)									
EB2411401-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 5716108)									
ES2410880-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001 (0.0010)*	mg/L	<0.0010	<0.0010	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 5716108) - continued									
ES2410880-002	Anonymous	EG020A-T: Nickel	7440-02-0	0.001 (0.010) *	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005 (0.052) *	mg/L	<0.052	<0.052	0.0	No Limit
ES2410603-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.010	0.011	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.003	85.1	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.013	0.029	75.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5716292)									
ES2409327-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	0.0006	0.0007	0.0	No Limit
ES2410826-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5712954)									
ES2411074-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EW2401640-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5712954)									
ES2411074-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EW2401640-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5712954)									
ES2411074-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EW2401640-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5714265)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	104	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	93.1	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	120	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	110	89.0	111
EG005T: Iron	7439-89-6	50	mg/kg	<50	31660 mg/kg	102	89.0	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	106	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	101	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	92.5	66.0	133
EA002: pH 1:5 (Soils) (QCLot: 5714270)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	99.5	98.8	101
				----	7 pH Unit	101	98.8	101
EA010: Conductivity (1:5) (QCLot: 5714271)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	103	92.0	108
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 5719919)								
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	2.5 meq/100g	104	80.0	110
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	4.17 meq/100g	102	80.0	110
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	1.28 meq/100g	102	80.0	110
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	2.17 meq/100g	104	80.0	110
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	----	----	----	----
ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5714264)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	102	70.0	125
EP004: Organic Matter (QCLot: 5721211)								
EP004: Organic Matter	----	0.5	%	<0.5	2.29 %	90.4	82.0	98.0
EP004: Total Organic Carbon	----	0.5	%	<0.5	1.36 %	88.2	81.0	99.0
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5713748)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	98.7	62.0	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 5713745)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	78.5	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	79.0	65.0	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 5713745) - continued								
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	90.0	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.0	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.2	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.5	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.1	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	104	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.0	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	83.6	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	81.3	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	80.4	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5713745)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	78.2	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	76.7	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	82.6	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	82.0	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	84.9	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.5	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.9	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	83.6	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	66.0	118

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5713745) - continued								
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	61.8	41.0	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5713481)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	96.2	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	101	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	102	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	100	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	99.4	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	103	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	94.8	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.4	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	96.8	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	101	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	97.1	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	100	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	101	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	100	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	97.5	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	98.1	63.0	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5713747)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	102	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	101	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	101	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	102	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	103	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	104	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	107	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	108	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	94.4	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	102	75.0	127

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5713747) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	86.0	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	98.8	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	98.8	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	74.3	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	73.0	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	69.8	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5712834)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	88.4	72.2	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5713482)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	101	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	102	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	100	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5713746)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	106	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	107	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	106	71.0	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5712834)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	74.4	72.4	133
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5713482)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	101	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	100	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	102	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5713746)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	107	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	106	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	110	63.0	131
EP080: BTEXN (QCLot: 5712834)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	87.6	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	84.7	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	81.8	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	89.2	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	81.8	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	108	78.8	122

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5716773)								
EP231X: Perfluoropropane sulfonic acid (PFPrS)	----	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.9	70.0	130
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.3	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.9	68.0	136
EP231X: Perfluorononane sulfonic acid (PFNS)	----	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	70.0	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5716773)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	85.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.1	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.9	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.3	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.3	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.7	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5716773)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.8	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.6	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.0	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5716773)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	103	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	96.1	64.0	140

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5716773) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	126	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	69.2	143

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 5716108)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.9	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.7	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.2	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.9	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.2	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	107	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5716292)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.7	77.0	111
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5712954)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	87.3	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5712954)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	84.9	75.0	127
EP080: BTEXN (QCLot: 5712954)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	111	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	96.5	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	96.1	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	108	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	99.7	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5714265)							
ES2410727-002	BH1_0.2-0.3	EG005T: Arsenic	7440-38-2	50 mg/kg	94.2	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.0	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	91.9	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	97.7	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	89.6	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	93.1	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5714264)							
ES2410727-002	BH1_0.2-0.3	EG035T: Mercury	7439-97-6	5 mg/kg	88.0	70.0	130
EP004: Organic Matter (QCLot: 5721211)							
EM2404846-015	Anonymous	EP004: Organic Matter	----	0.89 %	102	70.0	130
		EP004: Total Organic Carbon	----	0.52 %	100	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5713748)							
ES2410727-008	BH2_0.2-0.3	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	101	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 5713745)							
ES2410727-008	BH2_0.2-0.3	EP068: gamma-BHC	58-89-9	0.5 mg/kg	104	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	104	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	94.0	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	99.6	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	87.8	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	75.2	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5713745)							
ES2410727-008	BH2_0.2-0.3	EP068: Diazinon	333-41-5	0.5 mg/kg	76.5	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	90.7	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	80.7	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	103	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	91.9	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5713481)							
ES2411201-003	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	92.8	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	107	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5713747)							
ES2410727-008	BH2_0.2-0.3	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.7	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.6	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5712834)							
ES2410727-002	BH1_0.2-0.3	EP080: C6 - C9 Fraction	----	32.5 mg/kg	70.2	60.4	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5713482)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5713482) - continued							
ES2411201-003	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	99.1	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	104	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	118	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5713746)							
ES2410727-008	BH2_0.2-0.3	EP071: C10 - C14 Fraction	----	480 mg/kg	116	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	124	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	123	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5712834)							
ES2410727-002	BH1_0.2-0.3	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	65.7	61.1	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5713482)							
ES2411201-003	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	92.3	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	109	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	124	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5713746)							
ES2410727-008	BH2_0.2-0.3	EP071: >C10 - C16 Fraction	----	860 mg/kg	110	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	125	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	120	52.0	132
EP080: BTEXN (QCLot: 5712834)							
ES2410727-002	BH1_0.2-0.3	EP080: Benzene	71-43-2	2.5 mg/kg	78.4	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	77.4	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.0	67.4	123
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	74.4	66.4	121
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	77.4	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	78.6	61.1	115
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5716773)							
EB2411401-001	Anonymous	EP231X: Perfluoropropane sulfonic acid (PFPrS)	----	0.00125 mg/kg	96.1	70.0	130
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	81.2	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	100.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	96.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	94.9	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	100	68.0	136
		EP231X: Perfluorononane sulfonic acid (PFNS)	----	0.00125 mg/kg	111	70.0	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5716773)							
EB2411401-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	80.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	79.7	69.0	132

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Acceptable Limits (%) Low	Acceptable Limits (%) High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5716773) - continued							
EB2411401-001	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	79.1	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	91.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	88.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	97.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	88.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	79.3	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	96.1	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5716773)							
EB2411401-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	85.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	90.8	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	86.0	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	83.6	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	94.4	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	101	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5716773)							
EB2411401-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	95.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	109	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	94.1	69.2	143

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Acceptable Limits (%) Low	Acceptable Limits (%) High
EG020T: Total Metals by ICP-MS (QCLot: 5716108)							
ES2410603-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	111	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	104	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	114	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	120	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	112	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	112	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5716292)							
ES2409327-003	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	74.9	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5712954)							
ES2411074-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	103	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5712954)							
ES2411074-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	96.8	70.0	130
EP080: BTEXN (QCLot: 5712954)							
ES2411074-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	111	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	105	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	111	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	115	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	113	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	105	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2410727**	Page	: 1 of 11
Client	: **TETRA TECH COFFEY PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JESSIE SIXSMITH	Telephone	: +61-2-8784 8555
Project	: 754-SYDEN349808 Middle Head Pavilion	Date Samples Received	: 04-Apr-2024
Site	:	Issue Date	: 15-Apr-2024
Sampler	: Katie Trevor	No. of samples received	: 33
Order number	: ----	No. of samples analysed	: 19

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA001: pH in soil using 0.01M CaCl extract						
Soil Glass Jar - Unpreserved						
BH4_0.8-0.9	12-Apr-2024	11-Apr-2024	1	----	----	----

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001)							
BH4_0.8-0.9	**04-Apr-2024**	**12-Apr-2024**	11-Apr-2024	×	**12-Apr-2024**	12-Apr-2024	✓
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved (EA002)							
BH4_0.8-0.9	**04-Apr-2024**	**10-Apr-2024**	11-Apr-2024	✓	**10-Apr-2024**	10-Apr-2024	✓
EA010: Conductivity (1:5)							
Soil Glass Jar - Unpreserved (EA010)							
BH4_0.8-0.9	**04-Apr-2024**	**10-Apr-2024**	11-Apr-2024	✓	**10-Apr-2024**	08-May-2024	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
BH1_0.2-0.3, BH1_0.9-1.0, BH2_0.2-0.3, BH3_0.0-0.1, BH4_0.0-0.1, BH4_0.8-0.9, DUP-1, BH5_0.0-0.1, BH6_0.5-0.6, BH7_0.15-0.25, BH8_0.15-0.25, GS_01, GS_02	**04-Apr-2024**	**----**	----	**----**	**09-Apr-2024**	18-Apr-2024	✓
EA150: Soil Classification based on Particle Size							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA150H)							
BH4_0.8-0.9	**04-Apr-2024**	**----**	----	**----**	**12-Apr-2024**	01-Oct-2024	✓
EA152: Soil Particle Density							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA152)							
BH4_0.8-0.9	**04-Apr-2024**	**----**	----	**----**	**12-Apr-2024**	01-Oct-2024	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)							
BH1_0.2-0.3, BH1_0.4-0.5, BH1_0.9-1.0, BH2_0.2-0.3, BH3_0.0-0.1, BH4_0.0-0.1, BH5_0.0-0.1, BH6_0.5-0.6, BH8_0.15-0.25	**04-Apr-2024**	**----**	----	**----**	**09-Apr-2024**	01-Oct-2024	✓
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006)							
BH4_0.8-0.9	**04-Apr-2024**	**11-Apr-2024**	02-May-2024	✓	**11-Apr-2024**	02-May-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
BH1_0.2-0.3, BH1_0.9-1.0, BH2_0.2-0.3, BH3_0.0-0.1, BH4_0.0-0.1, BH4_0.8-0.9, DUP-1, BH5_0.0-0.1, BH6_0.5-0.6, BH7_0.15-0.25, BH8_0.15-0.25, GS_01, GS_02	**04-Apr-2024**	**09-Apr-2024**	01-Oct-2024	✓	**10-Apr-2024**	01-Oct-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
BH1_0.2-0.3, BH1_0.9-1.0, BH2_0.2-0.3, BH3_0.0-0.1, BH4_0.0-0.1, BH4_0.8-0.9, DUP-1, BH5_0.0-0.1, BH6_0.5-0.6, BH7_0.15-0.25, BH8_0.15-0.25, GS_01, GS_02	**04-Apr-2024**	**09-Apr-2024**	02-May-2024	✓	**11-Apr-2024**	02-May-2024	✓
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004)							
BH4_0.8-0.9	**04-Apr-2024**	**12-Apr-2024**	02-May-2024	✓	**12-Apr-2024**	02-May-2024	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
BH2_0.2-0.3, BH4_0.8-0.9, BH7_0.15-0.25, GS_01	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**11-Apr-2024**	19-May-2024	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
BH4_0.8-0.9, GS_01	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**11-Apr-2024**	19-May-2024	✓
Soil Glass Jar - Unpreserved (EP068)							
BH2_0.2-0.3, BH7_0.15-0.25	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**12-Apr-2024**	19-May-2024	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) BH4_0.8-0.9, GS_01	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**11-Apr-2024**	19-May-2024	✓
Soil Glass Jar - Unpreserved (EP068) BH2_0.2-0.3, BH7_0.15-0.25	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**12-Apr-2024**	19-May-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH1_0.2-0.3, BH1_0.9-1.0, BH3_0.0-0.1, BH4_0.0-0.1, DUP-1, BH5_0.0-0.1, BH6_0.5-0.6, BH8_0.15-0.25, GS_02	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**09-Apr-2024**	19-May-2024	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH2_0.2-0.3, BH4_0.8-0.9, BH7_0.15-0.25, GS_01	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**10-Apr-2024**	19-May-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) Trip blank	**02-Apr-2024**	**09-Apr-2024**	16-Apr-2024	✓	**09-Apr-2024**	16-Apr-2024	✓
Soil Glass Jar - Unpreserved (EP080) BH1_0.2-0.3, BH1_0.9-1.0, BH2_0.2-0.3, BH3_0.0-0.1, BH4_0.0-0.1, BH4_0.8-0.9, DUP-1, BH5_0.0-0.1, BH6_0.5-0.6, BH7_0.15-0.25, BH8_0.15-0.25, GS_01, GS_02	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**09-Apr-2024**	18-Apr-2024	✓
Soil Glass Jar - Unpreserved (EP071) BH2_0.2-0.3, BH4_0.8-0.9, GS_01	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**10-Apr-2024**	19-May-2024	✓
Soil Glass Jar - Unpreserved (EP071) BH7_0.15-0.25	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**11-Apr-2024**	19-May-2024	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
Trip blank	**02-Apr-2024**	**09-Apr-2024**	16-Apr-2024	✓	**09-Apr-2024**	16-Apr-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
BH1_0.2-0.3, BH1_0.9-1.0, BH2_0.2-0.3, BH3_0.0-0.1, BH4_0.0-0.1, BH4_0.8-0.9, DUP-1, BH5_0.0-0.1, BH6_0.5-0.6, BH7_0.15-0.25, BH8_0.15-0.25, GS_01, GS_02	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**09-Apr-2024**	18-Apr-2024	✓
Soil Glass Jar - Unpreserved (EP071)							
BH2_0.2-0.3, BH4_0.8-0.9, GS_01	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**10-Apr-2024**	19-May-2024	✓
Soil Glass Jar - Unpreserved (EP071)							
BH7_0.15-0.25	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**11-Apr-2024**	19-May-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
Trip blank, Trip spike - 4, TSC - 4	**02-Apr-2024**	**09-Apr-2024**	16-Apr-2024	✓	**09-Apr-2024**	16-Apr-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
BH1_0.2-0.3, BH1_0.9-1.0, BH2_0.2-0.3, BH3_0.0-0.1, BH4_0.0-0.1, BH4_0.8-0.9, DUP-1, BH5_0.0-0.1, BH6_0.5-0.6, BH7_0.15-0.25, BH8_0.15-0.25, GS_01, GS_02	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**09-Apr-2024**	18-Apr-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
BH1_0.2-0.3, BH2_0.2-0.3, BH4_0.8-0.9, BH7_0.15-0.25	**04-Apr-2024**	**10-Apr-2024**	01-Oct-2024	✓	**12-Apr-2024**	20-May-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
BH1_0.2-0.3, BH2_0.2-0.3, BH4_0.8-0.9, BH7_0.15-0.25	**04-Apr-2024**	**10-Apr-2024**	01-Oct-2024	✓	**12-Apr-2024**	20-May-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
BH1_0.2-0.3, BH2_0.2-0.3, BH4_0.8-0.9, BH7_0.15-0.25	**04-Apr-2024**	**10-Apr-2024**	01-Oct-2024	✓	**12-Apr-2024**	20-May-2024	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) BH1_0.2-0.3, BH2_0.2-0.3, BH4_0.8-0.9, BH7_0.15-0.25	**04-Apr-2024**	**10-Apr-2024**	01-Oct-2024	✓	**12-Apr-2024**	20-May-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) BH1_0.2-0.3, BH2_0.2-0.3, BH4_0.8-0.9, BH7_0.15-0.25	**04-Apr-2024**	**10-Apr-2024**	01-Oct-2024	✓	**12-Apr-2024**	20-May-2024	✓

Matrix: **SOLID**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) FC_01	**04-Apr-2024**	**----**	----	----	**09-Apr-2024**	01-Oct-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) Rinsate	**04-Apr-2024**	**10-Apr-2024**	01-Oct-2024	✓	**10-Apr-2024**	01-Oct-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) Rinsate	**04-Apr-2024**	**----**	----	----	**11-Apr-2024**	02-May-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080) Rinsate	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**09-Apr-2024**	18-Apr-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber VOC Vial - Sulfuric Acid (EP080) Rinsate	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**09-Apr-2024**	18-Apr-2024	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) Rinsate	**04-Apr-2024**	**09-Apr-2024**	18-Apr-2024	✓	**09-Apr-2024**	18-Apr-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Organic Matter	EP004	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Exchangeable Cations on Alkaline Soils	* ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).

Analytical Methods	Method	Matrix	Method Descriptions
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.4, table B-15 requirements.
Asbestos Identification in Bulk Solids	EA200	SOLID	In house: Referenced to AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Lyons 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations Preparation Method (Alkaline Soils)	* ED006PR	SOIL	In house: Referenced to Rayment and Lyons method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Lyons method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

TETRA TECH COFFEY

Consigning Office:	Tetra Tech Coffey, Chatswood, Level 20, Tower B, 799 Pacific Highway				
Report Results to:	Jessie Sixsmith	Mobile:	0434 851 353	Email:	jessie.sixsmith@tetratech.com
Invoices to:		Phone:		Email:	

Project No:	754-SYDEN349808	Task No:	Field work
Project Name:	Middle Head Pavilion	Laboratory:	ALS Environmental
Sampler's Name:	Katie Trevor	Project Manager:	Jessie Sixsmith
Quote number (if different to current quoted prices):			
Special Instructions:			

Lab Batch Ref	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	S26 (TRH/BTEXN/PAH/8 Metals)	S13 (OC/OP Pesticides, PCBs	PFAS - Full Suite (28 Analytes)	Asbestos	P22 (Iron, clay content, CEC, TOC, pH)	S18 (TRH/BTEXN)	NOTES
1	BH1_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
2	BH1_0.2-0.3	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X		X	X			
3	BH1_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard				X			
4	BH1_0.7-0.8	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
5	BH1_0.9-1.0	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
6	BH1_1.4-1.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
7	BH2_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
8	BH2_0.2-0.3	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X	X	X			
9	BH2_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
10	BH3_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
11	BH3_0.5-0.6	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
12	BH4_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
13	BH4_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
14	BH4_0.8-0.9	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X	X		X		
15	BH4_1.0-1.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
16	DUP-1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X						

Environmental Division Sydney
Work Order Reference
ES2410727

Telephone : +61-2-8784 8555

RELINQUISHED BY				RECEIVED BY			
Name:	Katie Trevor	Date:	4/04/2024	Name:	Dom	Date:	4/4/24
Company:	Coffey	Time:		Company:	ALS	Time:	5:15pm
Name:		Date:	→	Name:	Thanh L	Date:	4/4/24
Company:		Time:		Company:	ALS	Time:	1900

Sample Receipt Advice: (Lab Use Only)	
All Samples Recieved in Good Condition	☐
All Documentation is in Proper Order	☐
Samples Received Properly Chilled	☐
Lab. Ref/Batch No.	19.8, 4.7, 0.1 SC

*Container Type & Preservation Codes: **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

TETRA TECH COFFEY

Consigning Office:	Tetra Tech Coffey, Chatswood, Level 20, Tower B, 799 Pacific Highway				
Report Results to:	Jessie Sixsmith	Mobile:	0434 851 353	Email:	jessie.sixsmith@tetratech.com
Invoices to:	coffey admin	Phone:		Email:	

Project No:	754-SYDEN349808	Task No:	Field work
Project Name:	Middle Head Pavilion	Laboratory:	ALS Environmental
Sampler's Name:	Katie Trevor	Project Manager:	Jessie Sixsmith

Quote number (if different to current quoted prices):

Special Instructions:

Lab Batch Ref	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	S26 (TRH/BTEXN/PAH/8 Metals)	S13 (OC/OP Pesticides, PCBs	PFAS - Full Suite (28 Analytes)	Asbestos	P22 (Iron, clay content, CEC, TOC, pH)	S18 (TRH/BTEXN)	NOTES
—	TRIP-1	4/04/2024	AM/PM	Soil	J	Standard	X						Send to Eurofins
17	BH5_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
18	BH5_0.4-0.5	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
19	BH5_0.7-0.8	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
20	BH6_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
21	BH6_0.3-0.4	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
22	BH6_0.5-0.6	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
23	BH7_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard				X			
24	BH7_0.15-0.25	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X	X				
25	BH8_0.0-0.1	4/04/2024	AM/PM	Soil	J, P, Z	Standard							
26	BH8_0.15-0.25	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X			X			
27	FC_01	4/04/2024	AM/PM	Soil	Z	Standard				X			
28	GS_01	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X	X		X			
29	GS_02	4/04/2024	AM/PM	Soil	J, P, Z	Standard	X						
30+31	Trip blank and Spike — 4	2/04/2024	AM/PM	Soil	2x V each	Standard						X	
32	Rinsate	4/04/2024	AM/PM	water	G, 2xV	Standard	X						
33	TSC — 4												

Newcastle (2, 3, 5, 8, 10, 12, 17, 22, 26, 27)
Asbestos
Eurofins (576)
M.A 8/4/24
ES2410727

RELINQUISHED BY			RECEIVED BY		
Name:	Katie Trevor	Date: 4/04/2024	Name:		Date:
Company:	Coffey	Time:	Company:		Time:
Name:		Date:	Name:		Date:
Company:		Time:	Company:		Time:

Sample Receipt Advice: (Lab Use Only)

- All Samples Recieved in Good Condition ☐
- All Documentation is in Proper Order ☐
- Samples Received Properly Chilled ☐
- Lab. Ref/Batch No.

***Container Type & Preservation Codes:** P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

SAMPLES RECEIVED WITHOUT COC

CLIENT: Coffey	CARRIER:	ALS WO Label
PROJECT / QUOTE: Middlehead SYDEN 349808	CONNOTE #:	
CONTACT NAME:	AWB #:	
CONTACT NUMBER:	# OF ESKIES: 2 eskies SECURITY SEAL: Y N N/A	
SAMPLER NAME: Katie Trevor	TYPE OF ESKIES: 2 plastic bags	
SAMPLER NUMBER:	ESKY NUMBERS:	
SAMPLES RECEIVED BY: Dom	# OF SAMPLES:	
DATE/TIME RECEIVED: 4/4/24 3:15pm CLIENT SERVICES NOTIFIED BY:	TEMPERATURE:	

LAB ID	SAMPLE DETAILS: SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS	ADDITIONAL INFORMATION / COMMENTS:
					OTHER INFORMATION: ☐ MICRO ☐ BIOSECURITY ☐ BROKEN CONTAINERS ☒ COC EMAILED ☐ ALS COMPASS
1					
2					
3					
4					
5					
			TOTAL		

CORRESPONDENCE (DATE, INITIALS - DETAILS OF CORRESPONDENCE):

APPENDIX I: NEPM SITE SPECIFIC EIL OUTPUT

NEPC
National Environment Protection Council

Ecological Investigation Level Calculation Spreadsheet

Developed by CSIRO for the National Environment Protection Council

DISCLAIMER

This work has been prepared in good faith exercising due care and attention. However, no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this work in respect to any particular user's circumstances. Users of this work should satisfy themselves concerning its application to, and where necessary seek expert advice about, their situation. The Environment Protection and Heritage Council, the National Environment Protection Council and the NEPC Service Corporation shall not be liable to any persons or entity with respect to liability, loss or damage caused or alleged to have been caused directly or indirectly by this work.

Instructions on how to use the Ecological Investigation Level Calculation Spreadsheet

1. Select the ‘Data input and EILs’ worksheet.
2. Within the ‘Inputs’ box click on the cell containing the name of a contaminant (cell B5) and a drop-down menu symbol will appear. Click on the drop-down menu symbol and select the contaminant appropriate to your investigation. The name of the selected contaminant will then automatically appear in the contaminant cell (B5).
3. Depending on the contaminant selected in step 2 the ‘Inputs’ box will be modified.
4. In the cases of arsenic, DDT, lead and naphthalene being selected the ‘Inputs’ box will be cleared of all other cells and no further information is required. The EILs for fresh (present in soil for < 2 years) and aged (present in soil for ≥ 2 years) contamination for these contaminants in the three land-uses are presented in the ‘Outputs’ box.
5. When chromium (III), copper, nickel, or zinc is selected then other cells within the ‘Inputs’ box will appear and each of these cells require information to be added.
6. To obtain EILs for fresh copper contamination you will need to enter a value for the cation exchange capacity, soil pH, soil organic carbon content and either the measured background concentration or the soil iron content. If you do not enter a value into all the necessary cells then a fresh EIL can not be calculated and '# Num!' will appear in the EIL output cells. To obtain EILs for aged copper contamination you will need to enter a value for cation exchange capacity, soil pH, soil organic carbon content and either the measured background concentration or the name of the state where the site is located (or the nearest state) and whether the traffic volume is high or low. If you do not enter a value into all the necessary cells then an aged EIL can not be calculated and '# Num!' will appear in the EIL output cells. After you have entered each value press the ‘enter’ button. If you do not have a measured background concentration ensure that this cell (B16) is empty (not having a number, including 0). This cell can be emptied by using the 'delete' or 'backspace' keys. Do not use any other buttons to clear the cells.
7. To obtain EILs for fresh nickel contamination you will need to enter a value for the cation exchange capacity and either a measured background concentration or the soil iron content. If you do not enter a value into all the necessary cells then a fresh EIL can not be calculated and '# Num!' will appear in the EIL output cells. To obtain EILs for aged nickel contamination you will need to enter a value for the cation exchange capacity and either a measured background concentration or the name of the state where the site is located (or the nearest state) and whether the traffic volume is high or low. If you do not enter a value into all the necessary cells then an aged EIL can not be calculated and '# Num!' will appear in the EIL output cells. After you have entered each value press the ‘enter’ button. If you do not have a measured background concentration ensure that this cell (B16) is empty (not having a number, including 0). This cell can be emptied by using the 'delete' or 'backspace' keys. Do not use any other buttons to clear the cells.
8. To obtain EILs for fresh chromium III contamination you will need to enter a value for the soil clay content and either a measured background concentration or the soil iron content. If you do not enter a value into all the necessary cells then a fresh EIL can not be calculated and '# Num!' will appear in the EIL output cells. To obtain EILs for aged chromium III contamination you will need to enter a value for the soil clay content and either a measured background concentration or the name of the state where the site is located (or the nearest state) and whether the traffic volume is high or low. If you do not enter a value into all the necessary cells then an aged EIL can not be calculated and '# Num!' will appear in the EIL output cells. After you have entered each value press the ‘enter’ button. After you have entered each value press the ‘enter’ button. If you do not have a measured background concentration ensure that this cell (B16) is empty (not having a number, including 0). This cell can be emptied by using the 'delete' or 'backspace' keys. Do not use any other buttons to clear the cells.
9. To obtain EILs for fresh zinc contamination you will need to enter a value for the cation exchange capacity, soil pH and either a measured background concentration or the soil iron content. If you do not enter a value into all the necessary cells then a fresh EIL can not be calculated and '# Num!' will appear in the EIL output cells. To obtain EILs for aged zinc contamination you will need to enter a value for cation exchange capacity, soil pH and either a measured background concentration or the name of the state where the site is located (or the nearest state) and whether the traffic volume is high or low. If you do not enter a value into all the necessary cells then an aged EIL can not be calculated and '# Num!' will appear in the EIL output cells. After you have entered each value press the ‘enter’ button. If you do not have a measured background concentration ensure that this cell (B16) is empty (not having a number, including 0). This cell can be emptied by using the 'delete' or 'backspace' keys. Do not use any other buttons to clear the cells.

Background information on the EIL Calculation Spreadsheet

This spreadsheet is to be used to calculate the Ecological Investigation Levels (EILs) that are to be used in the National Environment Protection (Assessment of Site Contamination) Measure when assessing a contaminated site. The EILs are numerical limits that are designed to protect soil and terrestrial flora and fauna (including pets and wildlife) and soil microbial processes from experiencing substantial deleterious effects caused by contaminants. Ecological Investigation Levels are the ecological equivalents of the investigation levels that aim to protect human health (HILs) and groundwater (GILs). Measured concentrations of contaminants in the soil at a site are compared to the appropriate EILs and if they exceed the EILs then further investigation in the form of an ecological risk assessment that conforms to Schedule B5a (NEPC, 2011) should be conducted.

This spreadsheet uses the methodology set out in Heemsbergen et al. (2008) and Schedule B(5)b (NEPC, 2011) to calculate EILs for contaminated sites that have three land-uses: (1) national parks and areas of high conservation value; (2) urban residential and open public space; and (3) commercial and industrial land.

The toxicity data used and the actual calculations of the EILs for arsenic, chromium III, copper, DDT, lead, naphthalene, nickel and zinc are presented in Warne et al (2009) and Schedule B(5)c (NEPC, 2010). However, it should be noted that the example EIL values presented in Warne et al. (2009) have been rounded off during their calculation and therefore the values presented in that report will not match exactly with those derived by the EIL calculation spreadsheet. The EIL values calculated by the spreadsheet ALWAYS take precedence over those presented in Warne et al. (2009).
The method for deriving the EILs was developed in order to overcome all of the major limitations of the previous EILs (NEPM, 1999). The exact method used to calculate each EIL varied according to

(1) the physicochemical properties of the contaminant – which modified the key exposure pathways that were considered;

(2) whether the toxicity data could be expressed in terms of added contaminant concentrations (obtained by subtracting the background concentration from the total contaminant concentration). When such data were available a limit of how much contaminant could be added to soil before ecotoxicological effects commenced was determined – termed the Added Contaminant Level (ACL). Either a measured or predicted ambient background concentration (ABC) was then added to the ACL to obtain the EIL (see below)

EIL = ACL + ABC

The advantage of this 'added risk' method is that the EILs can never be less than the ambient background concentration.

When the toxicity data could not be expressed in terms of added concentration then the EIL was expressed as a total concentration, and it does not consider the ambient background concentration at the site.

(3) whether high quality empirical relationships were available that could predict the toxicity of contaminants using soil physicochemical properties. When these were available soil-specific EILs could be derived (where soils with different properties will have their own unique EIL). When these relationships were not available generic EILs (where a single numerical EIL applies to all Australian soils of a particular land-use) were derived.

(4) whether an ageing leaching factor (ALF) was available. The vast majority of toxicity data is derived from laboratory-based experiments that use freshly spiked contaminants. The two characteristics that differ between such laboratory experiments and field-based experiments are ageing and leaching of contaminants. Toxicity data from laboratory-based experiments were used to derive EILs for fresh contamination (i.e. when the contaminant has been present in the soil for less than 2 years). When ALFs were available they were used to adjust laboratory-based toxicity data to field-based data that was combined with actual field data to derive EILs for aged contamination (i.e. where the contaminant has been present in the soil for 2 or more years).

References

Heemsbergen D, Warne MStJ, McLaughlin MJ, Kookana R. 2008. A Proposed Australian Methodology to Derive Ecological Investigation Levels in Contaminated Soils. CLW Science Report. Prepared for the NEPM Review Team. 76p.

NEPC (National Environment Protection Council). 1999. National Environment Protection (Assessment of Site Contamination) Measure 1999. Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater. NEPC, Adelaide, Australia.16p.

NEPC (National Environment Protection Council). 2011. National Environment Protection (Assessment of Site Contamination) Measure. Schedule B(5)a. Guideline on Risk Assessment. National Environment Protection Council, Adelaide, South Australia. 42p.

NEPC (National Environment Protection Council). 2011. National Environment Protection (Assessment of Site Contamination) Measure. Schedule B(5)b. Guidelines on the Australian methodology to derive Ecological Investigation Levels in contaminated soils. National Environment Protection Council, Adelaide, South Australia. 85p.

NEPC (National Environment Protection Council). 2011. National Environment Protection (Assessment of Site Contamination) Measure. Schedule B(5)c. Soil quality guidelines for arsenic, chromium III, copper, DDT, lead, naphthalene, nickel and zinc. National Environment Protection Council, Adelaide, South Australia. 185p.

Background information on the EIL Calculation Spreadsheet

Warne MStJ, Heemsbergen DA, McLaughlin MJ, Kookana RS. 2009. Proposed soil quality guidelines for arsenic, chromium (III), copper, DDT, lead, naphthalene, nickel and zinc. CSIRO Land and Water Science Report 44/09. 195p.

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
6.4
Enter soil pH (calcium chloride method) (values from 1 to 14)
8
Enter organic carbon content (%OC) (values from 0 to 50%)
2.3
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
1.44
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Cu soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	40	60
Urban residential and open public spaces	70	140
Commercial and industrial	100	190

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
6.4
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
1.44
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Ni soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	10	15
Urban residential and open public spaces	25	65
Commercial and industrial	45	100

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged ACLs
Enter % clay (values from 0 to 100%)
14
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
1.44
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Cr III soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	75	140
Urban residential and open public spaces	180	410
Commercial and industrial	290	670

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
6.4
Enter soil pH (calcium chloride method) (values from 1 to 14)
8
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
1.44
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	40	140
Urban residential and open public spaces	120	360
Commercial and industrial	190	520

APPENDIX J: STATISTICAL ANALYSIS

	A	B	C	D	E	F	G	H	I	J	K	L
1					**Outlier Tests for Selected Variables**							
2				**User Selected Options**								
3				From File	WorkSheet.wst							
4				Full Precision	OFF							
5				Test for Suspected Outliers with Dixon test	1							
6				Test for Suspected Outliers with Rosner test	1							
7												
8												
9	**Dixon's Outlier Test for C6**							BaP TEQ				
10								Sample ID	Media	mg.kg		
11	Number of data = 14							GS_01	Fill	0.6		
12	10% critical value: 0.492							GS_02	Fill	0.6		
13	5% critical value: 0.546							BH1_0.2-0.3	Topsoil	1.7		
14	1% critical value: 0.641							BH1_0.4-0.5	Fill	-		
15								BH1_0.9-1.0	Fill	0.6		
16	**1. Data Value 38.2 is a Potential Outlier (Upper Tail)?**							BH2_0.2-0.3	Fill	4.2		
17								BH3_0.0-0.1	Topsoil	0.6		
18	Test Statistic: 0.976							BH4_0.0-0.1	Topsoil	0.6		
19								BH4_0.8-0.9	FIll	1.1		
20	For 10% significance level, 38.2 is an outlier.							DUP-1	FIll	0.6		
21	For 5% significance level, 38.2 is an outlier.							TRIP-1	FIll	1.3		
22	For 1% significance level, 38.2 is an outlier.							BH5_0.0-0.1	Topsoil	0.6		
23								BH6_0.5-0.6	Fill	0.6		
24	**2. Data Value 0.5 is a Potential Outlier (Lower Tail)?**							BH7_0.15-0.25	Fill	38.2		
25								BH8_0.15-0.25	Fill	0.6		
26	Test Statistic: 0.000											
27												
28	For 10% significance level, 0.5 is not an outlier.											
29	For 5% significance level, 0.5 is not an outlier.											
30	For 1% significance level, 0.5 is not an outlier.											
31												

	A	B	C	D	E	F	G	H	I	J	K	L
1					**Outlier Tests for Selected Variables**							
2				**User Selected Options**								
3				From File	WorkSheet.wst							
4				Full Precision	OFF							
5				Test for Suspected Outliers with Dixon test	1							
6				Test for Suspected Outliers with Rosner test	1							
7												
8												
9	**Dixon's Outlier Test for C4**							BaP				
10								Sample ID	Media	mg.kg		
11	Number of data = 14							GS_01	Fill	<0.5		
12	10% critical value: 0.492							GS_02	Fill	<0.5		
13	5% critical value: 0.546							BH1_0.2-0.3	Topsoil	1.1		
14	1% critical value: 0.641							BH1_0.4-0.5	Fill	-		
15								BH1_0.9-1.0	Fill	<0.5		
16	**1. Data Value 27.7 is a Potential Outlier (Upper Tail)?**							BH2_0.2-0.3	Fill	3.1		
17								BH3_0.0-0.1	Topsoil	<0.5		
18	Test Statistic: 0.978							BH4_0.0-0.1	Topsoil	<0.5		
19								BH4_0.8-0.9	FIll	0.7		
20	For 10% significance level, 27.7 is an outlier.							DUP-1	FIll	<0.5		
21	For 5% significance level, 27.7 is an outlier.							TRIP-1	FIll	0.8		
22	For 1% significance level, 27.7 is an outlier.							BH5_0.0-0.1	Topsoil	<0.5		
23								BH6_0.5-0.6	Fill	<0.5		
24	**2. Data Value 0.5 is a Potential Outlier (Lower Tail)?**							BH7_0.15-0.25	Fill	27.7		
25								BH8_0.15-0.25	Fill	<0.5		
26	Test Statistic: 0.000											
27												
28	For 10% significance level, 0.5 is not an outlier.											
29	For 5% significance level, 0.5 is not an outlier.											
30	For 1% significance level, 0.5 is not an outlier.											
31												

	A	B	C	D	E	F	G	H	I	J	K	L
1					**Outlier Tests for Selected Variables**							
2				**User Selected Options**								
3				From File	WorkSheet.wst							
4				Full Precision	OFF							
5				Test for Suspected Outliers with Dixon test	1							
6				Test for Suspected Outliers with Rosner test	1							
7												
8								TRH F3				
9				**Dixon's Outlier Test for C0**				Sample ID	Media	mg.kg		
10								GS_01	Fill	<100		
11	Number of data = 14							GS_02	Fill	<100		
12	10% critical value: 0.492							BH1_0.2-0.3	Topsoil	<100		
13	5% critical value: 0.546							BH1_0.4-0.5	Fill	-		
14	1% critical value: 0.641							BH1_0.9-1.0	Fill	<100		
15								BH2_0.2-0.3	Fill	230		
16	**1. Data Value 3070 is a Potential Outlier (Upper Tail)?**							BH3_0.0-0.1	Topsoil	<100		
17								BH4_0.0-0.1	Topsoil	<100		
18	Test Statistic: 0.990							BH4_0.8-0.9	FIII	<100		
19								DUP-1	FIII	<100		
20	For 10% significance level, 3070 is an outlier.							TRIP-1	FIII	130		
21	For 5% significance level, 3070 is an outlier.							BH5_0.0-0.1	Topsoil	<100		
22	For 1% significance level, 3070 is an outlier.							BH6_0.5-0.6	Fill	<100		
23								BH7_0.15-0.25	Fill	3070		
24	**2. Data Value 100 is a Potential Outlier (Lower Tail)?**							BH8_0.15-0.25	Fill	<100		
25												
26	Test Statistic: 0.000											
27												
28	For 10% significance level, 100 is not an outlier.											
29	For 5% significance level, 100 is not an outlier.											
30	For 1% significance level, 100 is not an outlier.											
31												

	A	B	C	D	E	F	G	H	I	J	K	L
1					**Outlier Tests for Selected Variables**							
2				**User Selected Options**								
3				From File	WorkSheet.wst							
4				Full Precision	OFF							
5				Test for Suspected Outliers with Dixon test	1							
6				Test for Suspected Outliers with Rosner test	1							
7												
8												
9				**Dixon's Outlier Test for C10**								
10								Total PAHs				
11	Number of data = 14							Sample ID	Media	mg.kg		
12	10% critical value: 0.492							GS_01	Fill	<0.5		
13	5% critical value: 0.546							GS_02	Fill	<0.5		
14	1% critical value: 0.641							BH1_0.2-0.3	Topsoil	10.8		
15								BH1_0.4-0.5	Fill	-		
16	**1. Data Value 506 is a Potential Outlier (Upper Tail)?**							BH1_0.9-1.0	Fill	<0.5		
17								BH2_0.2-0.3	Fill	31.5		
18	Test Statistic: 0.980							BH3_0.0-0.1	Topsoil	<0.5		
19								BH4_0.0-0.1	Topsoil	0.5		
20	For 10% significance level, 506 is an outlier.							BH4_0.8-0.9	FIII	5.1		
21	For 5% significance level, 506 is an outlier.							DUP-1	FIII	1.2		
22	For 1% significance level, 506 is an outlier.							TRIP-1	FIII	6.4		
23								BH5_0.0-0.1	Topsoil	<0.5		
24	**2. Data Value 0.5 is a Potential Outlier (Lower Tail)?**							BH6_0.5-0.6	Fill	<0.5		
25								BH7_0.15-0.25	Fill	506		
26	Test Statistic: 0.000							BH8_0.15-0.25	Fill	<0.5		
27												
28	For 10% significance level, 0.5 is not an outlier.											
29	For 5% significance level, 0.5 is not an outlier.											
30	For 1% significance level, 0.5 is not an outlier.											
31												

	Outlier Tests for Selected Uncensored Variables	
User Selected Options		
Date/Time of Computation	ProUCL 5.2 23/04/2024 11:40:07 AM	
From File	WorkSheet_a.xls	
Full Precision	OFF	

Dixon's Outlier Test for BaP TEQ

Number of Observations = 14

10% critical value: 0.492

5% critical value: 0.546

1% critical value: 0.641

1. Observation Value 38.2 is a Potential Outlier (Upper Tail)

Test Statistic: 0.971

For 10% significance level, 38.2 is an outlier.

For 5% significance level, 38.2 is an outlier.

For 1% significance level, 38.2 is an outlier.

2. Observation Value 0.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.6 is not an outlier.

For 5% significance level, 0.6 is not an outlier.

For 1% significance level, 0.6 is not an outlier.

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.2 23/04/2024 11:39:48 AM
From File	WorkSheet_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BaP TEQ

General Statistics

Total Number of Observations	13	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	0.6	Mean	1.054
Maximum	4.2	Median	0.6
SD	1.01	Std. Error of Mean	0.28
Coefficient of Variation	0.958	Skewness	2.927

Normal GOF Test

Shapiro Wilk Test Statistic	0.531	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.814	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.366	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.271	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.553	95% Adjusted-CLT UCL (Chen-1995)	1.757
		95% Modified-t UCL (Johnson-1978)	1.591

Gamma GOF Test

A-D Test Statistic	2.242	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.405	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.239	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.352	k star (bias corrected MLE)	1.861
Theta hat (MLE)	0.448	Theta star (bias corrected MLE)	0.566
nu hat (MLE)	61.16	nu star (bias corrected)	48.38
MLE Mean (bias corrected)	1.054	MLE Sd (bias corrected)	0.773
		Approximate Chi Square Value (0.05)	33.41
Adjusted Level of Significance	0.0301	Adjusted Chi Square Value	31.65

Assuming Gamma Distribution

95% Approximate Gamma UCL	1.526	95% Adjusted Gamma UCL	1.611

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.645	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.889	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.403	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.215	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

	A	B	C	D	E	F	G	H	I	J	K	L
59					Minimum of Logged Data	-0.511				Mean of logged Data		-0.175
60					Maximum of Logged Data	1.435				SD of logged Data		0.603
61												
62					**Assuming Lognormal Distribution**							
63					95% H-UCL	1.488				90% Chebyshev (MVUE) UCL		1.507
64					95% Chebyshev (MVUE) UCL	1.741				97.5% Chebyshev (MVUE) UCL		2.065
65					99% Chebyshev (MVUE) UCL	2.702						
66												
67					**Nonparametric Distribution Free UCL Statistics**							
68					**Data do not follow a Discernible Distribution**							
69												
70					**Nonparametric Distribution Free UCLs**							
71					95% CLT UCL	1.514				95% BCA Bootstrap UCL		1.885
72					95% Standard Bootstrap UCL	1.51				95% Bootstrap-t UCL		2.648
73					95% Hall's Bootstrap UCL	3.058				95% Percentile Bootstrap UCL		1.569
74					90% Chebyshev(Mean, Sd) UCL	1.894				95% Chebyshev(Mean, Sd) UCL		2.274
75					97.5% Chebyshev(Mean, Sd) UCL	2.803				99% Chebyshev(Mean, Sd) UCL		3.84
76												
77					**Suggested UCL to Use**							
78					95% Student's-t UCL	1.553						
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												

APPENDIX K: ASBESTOS CLEARANCE CERTIFICATE (ADE, 7 MAY 2024).

Asbestos Materials Clearance Inspection Report

Middle Head Oval Pavilion, Mosman NSW

Prepared for: Mosman Municipal Council

A301022.0173.01.W02 | CLR1.V1F | Date: 07/05/2024

Document Information

Report Title: Asbestos Materials Clearance Inspection Report
Prepared for: Mosman Municipal Council
Project Address: Middle Head Oval Pavilion, Mosman NSW
File Reference: A301021.0173.01.W02
Report Reference: CLR1.V1F
Date: 07/05/2024

Document Control

Version	Date	Author	Revision description	Reviewer
V1D	06/05/2024	Sijan Shrestha Makaju	Draft for internal review	Sanu Niraula
V1F	07/05/2024	Sijan Shrestha Makaju	Final for issue	Sanu Niraula

For and on behalf of
ADE Consulting Group Pty Ltd

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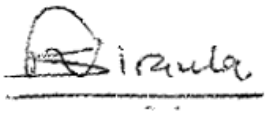
M. Sci (Env Sci)

Reviewed / Issued by:



Sanu Niraula
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CONTENTS

Executive Summary

ADE Consulting Group Pty Ltd (ADE) was commissioned by Mosman Municipal Council to undertake an Asbestos Materials Clearance Inspection Middle Head Oval Pavilion, Mosman NSW. The inspection was commissioned following the removal of non-friable (bonded) asbestos cement debris within gravelly fill of soil surface.

The removal of the asbestos containing materials (ACM) was undertaken by Absolute Environmental Services Pty Ltd, a Class A licensed asbestos removal company, on the 3rd of May 2024. The Asbestos Materials Clearance Inspection was undertaken on the same day. The inspection was carried out by Siddhartha Sapkota, Occupational Hygienist representing ADE.

The subject area of the inspection is defined as Middle Head Oval Pavilion accessed via Middle Head Road, approximately 10 meters (m), south of the pavilion, adjacent to water hydrant system, gravelly area, former location of asbestos cement debris, ground surface (refer to *Appendix I – Aerial Photograph and Appendix II –Photograph*).

The inspection revealed no visible or accessible asbestos remaining within the subject area at the time of inspection.

Based on the information presented in this report, it is the opinion of ADE that:

- The non-friable (bonded) asbestos cement debris was removed from the subject area to a satisfactory standard.

Please remain diligent and adhere to the limitations (*Appendix III – Statement of Limitations*) and restrictions (Section 2.2) stated within this report.

1 Introduction

1.1 Background

ADE was commissioned by Mosman Municipal Council to undertake an Asbestos Materials Clearance Inspection of the subject area located at Middle Head Oval Pavilion, Mosman NSW. The site inspection was carried out by Siddhartha Sapkota, an Occupational Hygienist representing ADE. This report represents the results of the inspection.

Table 1. Summary of Site Information.

Site Details	
Client Name:	Mosman Municipal Council
ADE Project Number:	A301021.0173.01. W02
Site Address:	Middle Head Oval Pavilion, Mosman NSW
Removal Contractor:	Absolute Environmental Services Pty Ltd
Date of Inspection:	03/05/2024
Date of Report:	07/05/2024
Subject Area:	The subject area of the inspection is defined as Middle Head Oval Pavilion accessed via Middle Head Road, approximately 10 meters (m), south of the pavilion, adjacent to water hydrant system, gravelly area, former location of asbestos cement debris, ground surface (refer to *Appendix I – Aerial Photograph and Appendix II – Photograph*).

1.2 Scope of Work

The scope of work included the following:

- Develop a site-specific Safety, Health and Environment Work Method Statement prior to undertaking the inspection.
- Visual inspection of the subject area following removal works; and
- Preparation of an Asbestos Materials Clearance Inspection Report outlining the site data and conclusions.

1.3 Legislative Requirements

The survey works, and production of this report have been undertaken in accordance with the requirements of:

- *Work Health and Safety Regulation* (2017).
- *Work Health and Safety Act* (2011).
- SafeWork NSW *Code of Practice: How to manage and control asbestos in the workplace* (2022); and

- SafeWork NSW *Code of Practice: How to safely remove asbestos* (2022.

1.4 Whole Report

No one section or part of a section of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the entire report, including its appendices and attachments.

2 Inspection Details

2.1 General

A thorough visual inspection was conducted by a Hygienist who walked parallel, overlapping paths over a grid pattern so not to miss any surface within the subject area to ensure a comprehensive coverage, thus informing the Clearance.

Visual examination of the subject area at approximately 11:00 AM AEST on the 3rd of May 2024 revealed the non-friable (bonded) asbestos cement debris within gravelly area had been removed from the subject area by Absolute Environmental Services Pty Ltd, a Class A licensed asbestos removal contractor (Refer to *Appendix II – Photographs*).

No debris associated with the asbestos removal works were visually observed on the surfaces directly along or adjacent to the subject area at the time of inspection (refer to *Appendix I – Aerial Photograph and Appendix II –Photograph*). The ACM was disposed of at a licensed asbestos waste-receiving facility.

2.2 Restrictions on Survey / Areas Not Accessed

Please note this report does not include any subsurface, grass covered areas or adjacent areas to the subject area. These areas are considered outside the scope of this report and may therefore still have asbestos containing materials. ACM may still be present in these areas. Please remain diligent and contact ADE immediately should any further contamination be discovered.

3 Conclusions

Based on the information presented in this report, it is the opinion of ADE that:

- The non-friable (bonded) asbestos cement debris was removed from the subject area to a satisfactory standard.

Please remain diligent and adhere to the limitations (*Appendix III – Statement of Limitations*) and restrictions (Section 2.2) stated within this report.

Appendix I – Aerial Photograph

Figure 1. Approximate location of the subject area located Middle Head Oval Pavilion, Mosman NSW (Map adapted from ***nearmap***, accessed on 06/05/2024).

Appendix II – Photographs

Photograph 1. Representative photograph of the subject material within the subject area, prior to removal, as observed on 03/05/2024.

Photograph 2. Representative photograph of the subject area, following removal, as observed on 03/05/2024.

Photograph 3. Representative photograph of the subject area, following removal, as observed on 03/05/2024.

Photograph 4. Representative photograph of the subject area, following removal, as observed on 03/05/2024.

Appendix III – Statement of Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only and has been based on information provided by the client. The advice herein relates only to this project and all results, conclusions and recommendations made should be reviewed by a competent and experienced person with experience in occupational hygiene, before being used for any other purpose ADE accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced or amended in any away without prior approval by the client or ADE and should not be relied upon by any other party, who should make their own independent enquiries.

This report does not provide a complete assessment of the status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, ADE reserves the right to review the report in the context of the additional information.

ADE's professional opinions are based upon its professional judgment, experience, training, and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and/or opinions. ADE has limited investigation to the scope agreed upon with its client.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable member of the Environmental Industry within Australia. No other warranty, expressed or implied, is made or intended.

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SOLUTIONS THROUGH INNOVATION

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