Construction Soil & Water Management Plan

Secondary Innovation Precinct (SIP) and Campus Commons, Pymble Ladies' College, 20 Avon Road, Pymble NSW 2073

Prepared For:	Pymble Ladies' College
Reference:	25-1941
Date:	25 March 2025

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Document History:		
Document No	**Revision No.**	**Issue Date**
25-1941	A	06.03.2025
25-1941	B	07.03.2025
25-1941	C	10.03.2025
25-1941	D	11.03.2025
25-1941	E	13.03.2025
25-1941	F	25.03.2025

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TABLE OF ABBREVIATIONS

3XN	3XN Architects
ANZECC/ARMCANZ	Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000 Water Quality Guidelines
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soils Management Plan
AS/NZS	Australian Standard / New Zealand Standard
CSWMP	Construction Soil and Water Management Plan
COP	Code of Practice
DA	Development Application
DPHI	Department of Planning, Housing and Infrastructure
EPA	Environmental Protection Agency
EPL	Environmental Protection License
ESCP	Erosion and Sediment Control Plan
IS	Infrastructure Sustainability Rating Scheme
LAA	Licensed Asbestos Assessor
LGA	Local Government Area
NCP	National Code of Practice
NCR	Non-Conformance Report
NEPM	National Environment Protection Measures
OEH	Office of Environment and Heritage
PLC	Pymble Ladie's College
POEO	Protection of the Environment Operations Act 1997
PPE	Personal Protective Equipment
PIRMP	Pollution Incident Response Management Plan
RRO	Resource Recovery Order
SEAR	Secretary's Environmental Assessment Requirements
SIP	Secondary Innovation Precinct
SSDA	State Significant Development Application (SSDA-79146716)
SWMP	Soil & Water management plan
SWMS	Safe Work Method Statement
VENM	Virgin Excavated Natural Material
WHS	Work Health and Safety

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TABLE OF DEFINITIONS

ABBREVIATION	DESCRIPTION
Environmental Impact	Defined by AS/NZS ISO 14001:2004 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisations environmental aspects.
Environmental Incident	An unexpected event that causes or has the potential to cause harm to the environment and requires some action to minimise the impact or to restore the environment. Any occurrence that has resulted in or has the potential to result in adverse consequences to the environment, including air, water, land, natural resources, flora, fauna, habitats, ecosystems and/or biodiversity.
Non-compliance	Failure to comply with the requirements of the project approval or any applicable license, permit or legal requirements
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
Reportable incident	As defined in the *Protection of the Environment Operations Act 1997,* pollution incidents causing or threatening harm to the environment must be notified. A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur.
Sensitive Receivers	Includes residences, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres and passive recreation areas (including outdoor grounds used for teaching). Receivers that may be considered to be sensitive include commercial premises (including film and television studios, research facilities, entertainment spaces, temporary accommodation such as caravan parks and camping grounds, restaurants, office premises, and retail spaces), and industrial premises as identified by the Planning Secretary.
Unexpected Find	An object or place that is discovered which may be a heritage item but was not identified in the documents listed in the consent or suspected to be present.
Waste	1. Waste includes anything, other than a resource approved that is— (a) left over, or an unwanted by-product, from an industrial, commercial, domestic, or other activity; or (b) Surplus to the industrial, commercial, domestic, or other activity generating the waste. 2. Waste can be a gas, liquid, solid or energy, or a combination of any of them. 3. A thing can be waste whether or not it is of value. 4. The administering authority may approve a resource, or a stated type of resource, or has a beneficial use other than disposal.

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TABLE OF CONTENTS

ECON Environmental Pty Ltd | ABN 25 641 106 783 | 1 St Aidans Avenue Oatlands NSW 2117
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1. INTRODUCTION

1.1 Purpose and Application

ECON Environmental Pty Ltd has been commissioned by Pymble Ladies' College (the College) to prepare this Construction Soil and Water Management Plan (CSWMP), in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs) and in support of the preparation of an Environmental Impact Statement (EIS) and State Significant Development Application (SSD- 79146716) to the Department of Planning, Housing and Infrastructure (DPHI).

This report has been prepared with reference to architectural plans prepared by 3XN and dated March 2025.

1.2 SEARS Table Response

Table 1: Project SEAR SSDA 79146716

Condition	Section of the Report
12. Ground and Water Conditions	
Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils	Section 9
Provide a Surface and Groundwater Impact Assessment that assess potential impacts on: • Surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses. • Groundwater resources in accordance with the Groundwater Guidelines	Section 9

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2. SITE IDENTIFICATION

2.1 Site Details

The subject site is located south of Avon Road and set amongst Low and Medium and High Density Residential properties. Figures 1 below shows an aerial photograph of the subject site relative to its surrounding land. Figure 2 below shows the proposed development plans.

Table 2: Site Identification	
Street Address	20 Avon Road Pymble NSW 2073
Lot and DP Number (current)	Lot 1 in DP69541, and Lots 11-17 in DP7131
Subject Site Area	20.25ha *(approximately)*
Project Development Area	10,856 sqm *(approximately)*
Zoning	SP2 – Educational Establishment
Local Government Area	Ku-Ring-Gai Council

2.2 Key Features of the Subject Site

- The site accommodates the existing Pymble Ladies' College which accommodates Kindergarten to Year 12 students.
- Vehicular access to the College is provided via separate ingress and egress driveways on the northern and western sections of Avon Road.
- Pedestrian access is provided through multiple gates along Avon Road.
- The project area that is subject to this SSDA is located at the entrance to the College west of the oval.
- The project area slopes down from south to north with a fall from RL 124.50 at the southern corner to RL 116 at the north west corner.

2.3 Key Features of the Locality

The development context surrounding the site is a leafy suburban environment, predominantly made up of detached residential properties set within expansive gardens and along avenues lined with mature trees.

Recent developments of moderate-scale residential apartment buildings occur closer to the railway corridor. Two storey commercial establishments are located near to Pymble train station, specifically along the Pacific Highway and on the northern flank of the railway line.

- The site is located approximately 19km north west of the Sydney Central Business District.

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- The College is situated approximately 200m from Pymble train station, situated on Pacific Highway and Pymble town centre.

2.4 Surrounding Land Use

The subject site adjoins:

- **North:** Avon Road and Pacific Highway (approximately 400m).
- **East:** Residential uses, accommodating a mixture of dwelling houses and residential flat buildings.
- **South:** Avondale Golf Course.
- **West:** Avon Road, beyond which is a residential area characterised by detached dwelling houses.

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3. PROJECT DESCRIPTION

3.1 Brief Description

The project comprises demolition of several existing buildings and the construction of the Secondary Innovation Precinct, associated landscaping and Campus Commons at the Pymble Ladies College. The SIP is a five-storey building that will consolidate STEM based learning opportunities within the College.

3.2 Detailed Description

The proposal seeks development approval for the Secondary Innovation Precinct (SIP) and Campus Commons at Pymble Ladies' College. The development comprises:

- Demolition of the existing Isabel Harrison, Dorothy Knox, John Vicars and Robert Vicars Buildings.
- Tree removal.
- Excavation of the basement level.
- Construction of the new five storey SIP building of RL 146.98m and including:
    - General Learning Spaces.
    - STEM teaching spaces.
    - Senior student facilities.
    - Function spaces.
    - Food and beverage facilities.
    - Associated amenities.
    - Storage and building services.
- Within the basement, there will be one loading space (for utes and vans) for services and deliveries, accessible from the existing service vehicle access road. There will be no car parking. Minor kerb realignment of the existing access road to the east of the SIP.
- Landscaping on the outdoor terraces and surrounding the building.
- The project also includes the Campus Commons, a significant garden lawn and amphitheatre connecting the SIP precinct to the rest of the campus.

3.3 Hours of Operation

Monday – Friday - 7.30am- 6pm

Saturday - Open for special events

Sunday - Open for special events

It is anticipated that the venue would be primarily used during the school term time however the SIP may operate during school holiday times within the hours nominated above.

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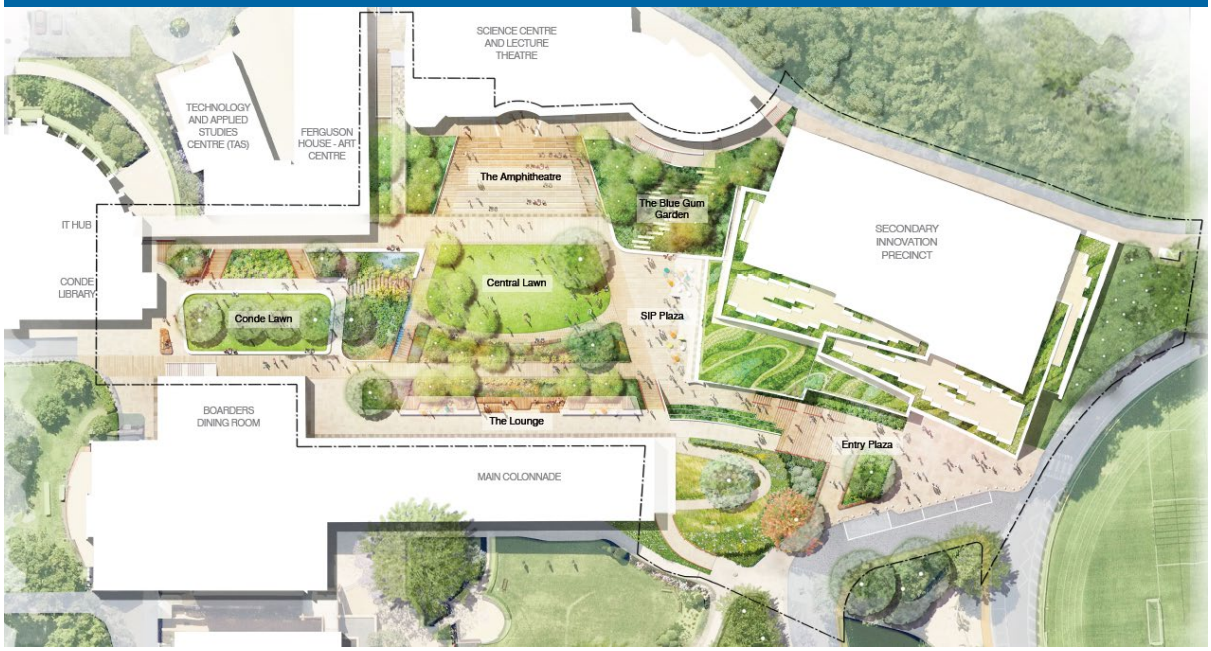
3.4 Site Layout and Work Areas

Figure 1: Aerial View of subject site. *Source: Urbis*

Figure 2: Concept Drawings of the Proposed SIP Development Site & Campus Commons. *Source: TCL*



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3.5 Construction Program

- Approval is sought for the detailed development of the project.
- Construction will occur in a single stage over 24 months from December 2026 to December 2028.
- Construction will occur within standard construction hours

3.6 Employment Numbers

- 80-100 full-time employment (1.00 FTE) construction jobs per annum.

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4. EMERGENCY & AUTHORITY CONTACTS

An environmental incident is an occurrence as a consequence of pollution, or an unexpected adverse environmental impact has occurred, is occurring, or is likely to occur.

The requirement to notify regulatory agencies is triggered when an environmental incident has or is threatening to cause environmental harm in accordance with Section 147 of the Protection of the Environment Operations Act 1997, as follows:

1. *harm to the environment is material if:*
    a. *it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or*
    b. *it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and*
2. *loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.*

    For the purposes of this Part, it does not matter that harm to the environment is caused only in the premises where the pollution incident occurs.

Material harm to the environment could include, but not be limited to:

- Pollutant discharge to water or stormwater drains,
- Spill of chemicals to land,
- Unapproved handling of waste,
- Soil & Water Quality degradation, and
- Adverse impacts to the community.

Table 3: Emergency Contacts and Procedures	
Action	Responsibility
Assess the incident: If the incident is not safely containable, call 000 immediately for emergency assistance. If the incident is causing or threatens to cause material harm to the environment or is "significant" or "major", notify the following immediately: • NSW EPA Pollution Hotline – 131 500 • Hornsby Shire Council – 02 9847 6666 • The Ministry of Health – 1300 066 055 – *directed to the local public health unit or visit the NSW Health website.* • SafeWork NSW – 13 10 50 • Fire and Rescue NSW – 02 9265 2999 • Hornsby Ku-ring-gai Hospital – 02 9477 9123 • Site Owner - Pymble Ladies College 02 9855 7628 • Project Director – Greg Hastie – Project Director 0411 477 006	Person first on scene
If required, identify materials and obtain appropriate PPW: PPE such as gloves, masks, suits, breathing apparatus etc. should be used appropriately for self-protection.	Person first on scene
Contain the incident: Take suitable action to contain the incident, e.g. emergency bunding for spills, closing off valves for pipe leaks, stopping machinery etc.	Person first on scene
Inform Project Manager: Isolate the area from pedestrians and vehicles.	Person first on scene
Project Manager notifies Delivery Manager: Delivery Manager to provide direction to team.	Delivery Manager
Determine cause of the incident: For major environmental incidents, contact the General Manager.	Delivery Manager
Protect adjacent areas from impact: For example, protect nearby downstream drains or waterways by placing sand-bags around them.	Project Manager
Clean up area or repair as required: For example, use spill kit absorbents to clean up spills.	Project Manager
Dispose of waste as required: Arrange for waste disposal to a facility that is licensed to accept the waste.	Project Manager
Complete Environmental Incident Report: Report incident and review procedures as required.	Project Manager

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5. PURPOSE AND SCOPE

5.1 Background

This Soil and Water Management Plan (CSWMP) is a key element of the overall Construction Environmental Management Plan (CEMP) and describes how principal contractor will manage obligations and performance with regards to aspects and potential impacts associated with soil and water during the construction of the Project.

The potential soil and water impacts associated with the construction of the Project includes the following:

- Surface water impacts due to construction activities (working above water),
- Inundation of upstream land and tributaries,
- Erosion and sedimentation,
- Construction waste including spoil management/contamination and transport, and
- Flood flows.

5.2 Purpose

This CSWMP describes the soil and water management approach that will be utilised by the principal contractor, their employees and its subcontractors during construction of the Project. This CSWMP forms an integral part of the project' CEMP. It applies to all works associated with the SIP development works and establishes the environmental management controls to be implemented by the principal contractor's employees and its subcontractors.

The CSWMP addresses the soil, surface water and groundwater requirements of the:

- SEAR SSDA-79146716

5.3 Scope

The CSWMP outlines the mitigation and management the principal contractor will use to address potential soil and surface water quality impacts during the construction of the Project, while complying with relevant approvals, statutory and contract requirements.

Specifically, this CSWMP will address the impacts relating to the following environmental aspects, which is addressed in the SEAR SSDA-79146716:

- Earthworks and Spoil management
- Surface water reuse and discharge
- Construction phase flooding
- Saline soils and Acid sulfate soils
- Chemical storage and spill response.

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6. OBJECTIVES AND TARGETS

The key objective of the CSWMP is to describe how the principal contractor will manage and protect soils and water within the permitted criteria during the construction of the Project. Table 4 below outlines the principal contractor's soil and water objectives and targets for the Project. These objectives and targets have been developed with consideration of key performance indicators within the SEAR SSDA-79146716. Specific CEMP construction objectives in relation to soil and water management have also been outlined in Table 4.

Table 4: Soil and Water Targets and Performance Criteria

Objective	Target	Performance Indicators
Minimise pollution of surface waters through appropriate erosion and sediment control	• Prepare and implement Erosion and Sediment Control Plans in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004; the Blue Book) at all sites	• Weekly inspections checklist (i.e. inspection of erosion and sediment control measures with controls rectified as soon as practicable. • Audit reports • Weather monitoring records • Pre and Post rainfall inspections/checklists
Minimise Leaks and spills from construction activities	• Zero leaks or spills resulting in environmental harm	• Plant maintenance records, pre-delivery inspection report, and prestart inspection records • Internal weekly inspections checklist (i.e., spill kits are well stocked).
Maintain existing water quality of surrounding surface watercourses	• Surface water quality monitoring in receiving waterways demonstrates the NSW Water Quality Objectives are improved and maintained (where values are not achieved) • No discharging without completing a permit to discharge (GA-FRM-HSE-138 Permit to Discharge Water)	• Monitoring program and associated reporting
Source construction water from non-potable sources, where feasible and reasonable	• >50% of construction water is sourced from non-potable sources	• Sustainability monitoring program and associated reporting • Water balance study

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The construction performance outcomes for the Project and those relevant to this CSWMP is summarised in Table 5 below.

Table 5: Construction Performance Outcomes

Performance Outcome Requirement	CSWMP Performance Outcomes	Proposed Method to Achieve Outcome
Spoil generated during the construction is effectively stored, handled, treated (if necessary), reused, and/or disposed of lawfully and in a manner that protects environmental values	• 100% of useable spoil I reused in accordance with the spoil hierarchy • The use of potable water for non-potable purposes is avoided if non-potable water is available • The reuse of water is maximised, either onsite or offsite	• Spoil would be classified in accordance with Waste Classification Guidelines (NSW Environmental Protection Authority, 2014). Spoil that is classified as virgin excavated natural material, excavated natural material, subject to a resource recovery order/resource recovery exemption under the Protection of the Environment Operations (Waste) Regulation 2014 or is otherwise reusable would be reused (consistent with 100% beneficial reuse performance outcome). • The water treatment plant would minimise water use and use non-potable water where feasible.
To protect the NSW Quality Objectives where they are currently being achieved and contribute towards achievement of the Water Quality Objectives over time where they are currently not being achieved, including downstream of the project to the extent of the project impact including estuarine and marine waters (if applicable).	• The discharge water quality requirements outlined in applicable environment protection licence(s) are met. • Existing water quality of receiving surface watercourses is maintained.	• Wastewater would be treated, and standard erosion and sediment control measures would be implemented for all surface works areas to minimise pollutant loading to the downstream waterways during construction. • Wastewater would be treated to comply with the ANZECC/ARMCANZ (2000) and ANG (2018) guidelines and runoff from construction works would be designed to meet the standards outlined in the Blue Book. • Discharges from construction would be monitored for compliance with the discharge criteria in the Project's environmental protection license.

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7. ENVIRONMENTAL REQUIREMENTS

7.1 Legislation and Standards

The principal contractor's obligations include satisfying the requirements and complying with the provisions of the relevant legislation, guidelines, and policies, as well as SEAR SSDA-79146716. Details are provided in Table 6.

Table 6: Legislation, Standards, Policies and Guidelines relevant to the Project

Legislation	• (NSW) Protection of the Environment Operations Act 1997 (POEO Act) • (NSW) Protection of the Environment Operations (General) Regulation 2009 • (NSW) Protection of the Environment Operations (Waste) Regulation 2014 • (NSW) Contaminated Land Management Act 1997 (CLM Act) • (NSW) Environmental Trust Act 1998 • (NSW) Water Management Act 2000 (WM Act) • Sydney Water Act 1994 • Environmental Planning and Assessment Act 1979 (where modification require assessment) • Dangerous Goods (Road and Rail Transport) Regulation 2009
Standards	• AS/NZS ISO 14001:2015 Environmental Management • AS 1940-2017: The Storage and Handling of Flammable and Combustible Liquids • AS 4452-1997: The Storage and Handling of Toxic Substances
Guidelines and Specifications	• A Framework for Assessing the Sustainability of Soil and Groundwater Remediation (SuRF-UK 2010) • Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (EPA 2022) • Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018) • Consultants Reporting on Contaminated Land – Contaminated Land Guidelines (EPA 2020) • Department of Environment and Conservation (DEC): Bunding & Spill Management. • Insert to the Environment Protection Manual for Authorised Officers – Technical section "Bu" November 1997 • Guidelines for the Assessment and Management of Groundwater Contamination (DEC 2007) • Guidelines on the Duty to Report Contamination under the *Contaminated Land Management Act 1997* (EPA 2015) • Guidelines for the NSW Site Auditor Scheme, 3rd edition (EPA 2017) • Managing Urban Stormwater: Soils and Construction, Volume 1 and Volume 2 (Landcom 2004) (the "Blue Book"). • National Environment Protection Council (NEPC) 1999 (amended 2013), National Environment Protection (Assessment of Site Contamination) Measure (NEPM) • NSW Acid Sulfate Soil Manual (ASSMAC 1998) • NSW Groundwater Dependent Ecosystem Policy (DLWC 2002) • NSW Groundwater Policy Framework Document (DLWC 2002) • NSW Groundwater Quality Protection Policy (DLWC 1998) • NSW Groundwater Quality Management Policy (DLWC 2007) • NSW Water Extraction Monitoring Policy (DWE 2007) • NSW Aquifer Interface Policy (NoW 2012) • PFAS National Environmental Management Plan 2.0 (HEPA, 2020). • Requirements for publishing pollution monitoring data (EPA 2013)

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	• Water Sharing Plan, Greater Metropolitan Reginal Groundwater • Sources Background Document, Sydney (NoW 2011).

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8. EXISTING ENVIRONMENT SETTINGS

The existing environment relevant to this CSWMP is detailed in the following previous environmental investigations:

- *JK Geotechnics, Geotechnical Investigation for Proposed Secondary Innovation Precinct and Campus Commons at Pymble Ladies College, Avon Road, Pymble NSW, Ref: 34901SCrptRev2, dated 28 February 2025.*
- *ECON Environmental, Waste Classification Assessment, for Proposed Secondary Innovation Precinct and Campus Commons, Pymble Ladies College, Avon Road, Pymble NSW, Ref: 24-1683_revC, dated 13 March 2025.*
- *Greywacke Geotechnics, Preliminary Acid Sulfate Soils Assessment, Proposed SIP and Campus Commons, Pymble Ladies College, Avon Road, Pymble NSW, Ref: ECOE0977-GEO AA Rev03, dated 25 March 2025.*

The following sections summarise the existing environment with respect to soil and water, using relevant information from the abovementioned previous investigation reports.

8.1 Topography

Imagery available on the Department of Lands and Spatial Information Exchange website and plans provided by the client show that the site is located at approximate elevations between 116, AHD (Australian Height Datum) and 126m AHD. The site terrain is moderately sloping down from east to west with slopes up to 14^{O}.

The topography of the surrounding area comprises low rolling and steep hills. Local relief 50-120m slopes 5-20%.Convex narrow (20-300m) ridges and hillcrests grade into moderately inclined side slopes with narrow concave drainage lines. Moderately inclined slopes of 10-15% are the dominant landform elements.

8.2 Regional Geology

The Geological Map (Seamless Geology) provided by the Department of Primary Industries and Regional Development – NSW Resource online portal shows that the site is primarily underlain by Hawkesbury Sandston (Rh) and contains medium to coarse grained quartz, sandstone with very minor shale and laminite lenses.

A geology map excerpt is provided in Figure 3 below with the location of the subject site.

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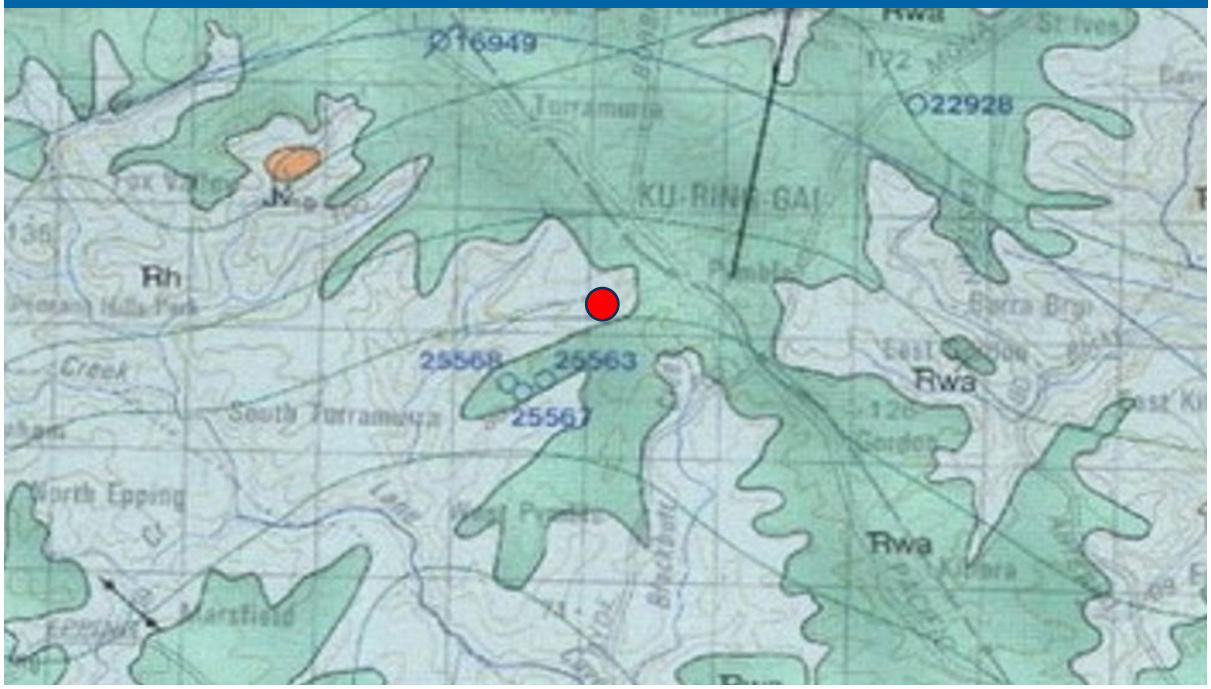
Figure 3: Geological Excerpt

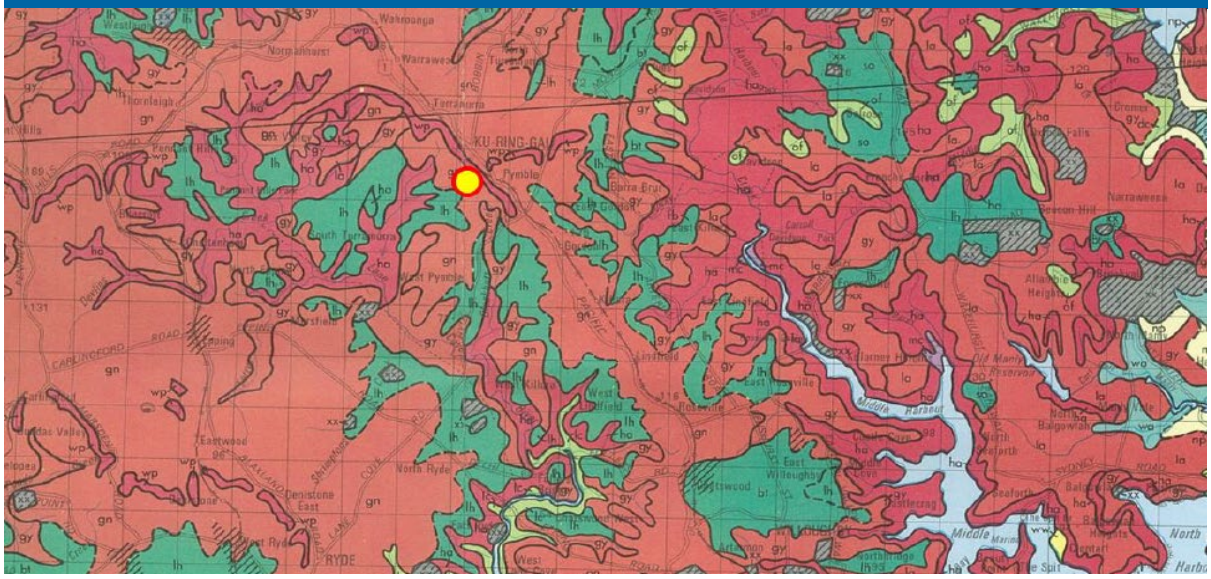


Hawkesbury Sandstone consists of medium to coarse-grained quartz sandstone with minor shale and laminite lenses.

8.3 Soil Landscapes

The Soil Landscapes of the Wollongong-Port Hacking 1:100,000 Sheet indicates the site is located within the Glenorie **(gn)** subgroup. A map excerpt of the Wollongong-Port Hacking Soil Landscape map is provided in Figure 4 below.

Figure 4: Soil Landscape Map Excerpt



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Glenorie Landscape (Erosional) – Undulating to rolling hills on Wianamatta Group Shales. Local relief 50m-80m, slopes 5%-20%. Narrow ridges, hillcrests and valleys. Extensively cleared tall open-forest (wet sclerophyll forests).

Soils – Shallow to moderately deep (<100cm) Red Podzolic Soils on crests; moderately deep (70-150cm) Red and Brown Podzolic Soils on upper slopes: deep (>200cm) Yellow Podzolic Soils and Gleyed Podzolic Soils along drainage lines.

Limitations – High soil erosion hazard, localised impermeable highly plastic soil, moderately reactive.

8.4 Secondary School Innovation Precinct Geotech Findings

The geotechnical report provided by *JK Geotechnics (Ref: 34901SCrptRev2, dated 28 February 2025)* indicated that the boreholes encountered fill covering residual silty clay graded into weathered siltstone and sandstone bedrock. Summary of the sub-surface profile within the subject site is described below:

Pavements: Pavers with a thickness of 40mm overlying concrete with thicknesses ranging from 100mm to 250mm were encountered in BH2 to BH4. In BH3 and BH4 a sand blinding layer was encountered between the pavers and the concrete. At the surface of BH103 a concrete pavement with a thickness of 140mm was encountered. BH101, BH102 and BH104 encountered asphaltic concrete (AC) with thicknesses ranging from 20mm to 40mm. Concrete was encountered below the AC within BH102 and BH104 and had thicknesses of 180mm and 160mm, respectively.

Fill: Fill was encountered in all boreholes to depths ranging from 0.4m to 2.3m. The fill predominantly comprised silty clay, with varying proportions of gravel. The gravel component within the fill comprised igneous, siltstone and ironstone gravel. Based on the SPT 'N' values, the fill was assessed to be poorly or moderately compacted with some localised well compacted bands.

Residual Silty Clay: Residual silty clay assessed to mostly be of medium to high plasticity and of very stiff to hard strength extended to the underlying siltstone bedrock.

Weathered Sandstone and Siltstone: Weathered siltstone bedrock was encountered at depths ranging from 0.9m to 4.2m, with the level of the surface of the rock falling down towards the north from about RL121.8m in BH1 to about RL111m in BH102. The siltstone was initially assessed to be extremely weathered to highly weathered and of hard (soil strength) to very low strength. Within the cored portions of the boreholes, the weathering and strength improved with depth to generally moderately or slightly weathered and of low to medium or medium to high strength below depths ranging from 5.2m (~RL110.8m) to 10.7m (or ~RL115.1m).

In BH3, BH4 and BH103 interbedded siltstone/sandstone, laminite and sandstone were encountered below the siltstone profile. The cored rock in BH3 and BH4 was of higher strength and contained fewer defects that the rock cored in BH1 and BH2. In BH102 and BH104, slightly weathered or fresh sandstone bedrock was encountered below the siltstone profile. The sandstone bedrock was assessed to be generally of medium to high strength.

Defects within the cored bedrock comprised extremely weathered seams of generally less than 110mm, sub horizontal bedding partings, and joints inclined at up to 90°. Significant core loss zones were also noted within BH1, BH101 and BH104 which are indicative of extremely weathered bands.

The following table summarises the rock levels and the rock classification in the cored boreholes in accordance with Classification of Sandstone and Shales in the Sydney Region: Forty Year Review by Pells et al 2019.

Groundwater: Groundwater seepage was not encountered during auger drilling of the boreholes, which were dry on completion of auger drilling. Once coring is commenced water is introduced which obscures the true groundwater level. The groundwater within the monitoring wells allowed to stabilise over several weeks and return visits were made to measure the groundwater levels.

Campus Commons: All boreholes encountered fill to depths ranging from 0.5m to 0.8m. With exception of BH202, the fill initially comprised silty sand to depths ranging from 0.1m to 0.4m and then silty clay. In BH2 silty clay fill was encountered directly below the Aspahltic Concrete (AC) surface. The fill contained varying fractions of slag, ash, ironstone gravel and root fibres. Based on DCP tests, the fill was assessed to be poorly to moderately compacted.

Residual silty clay was encountered within all boreholes and was assessed to be of medium to high plasticity and of stiff to very stiff strength. The boreholes refused within the clays at depths ranging from 0.97m to 1.53m.

The DCP tests refused at depths ranging from 1.5m (DCP202) to 2.1m (DCP207), but since these tests do not provide sample recovery the nature of the material that caused refusal cannot be confirmed. Refusal may have occurred on the surface of the underlying siltstone, but it may also have occurred on ironstone layers within the residual silty clay. We note that we have previously drilled boreholes to the north-east of the site for the proposed secondary school building and weathered siltstone was encountered at depths ranging from 0.9m to 4.2m.

Groundwater was not encountered during or on completion of drilling of the boreholes.

Reference should be made to the borehole logs, DCP test results within the *JK Geotechnics report (Ref: 34901SCrptRev2, dated 28 February 2025)* for detailed descriptions of the subsurface conditions encountered.

Laboratory Test Results: The point load strength index test results showed reasonably good correlation with our field assessment of rock strength. The Unconfined Compressive Strength (UCS) of the rock core, estimated from the point load strength index test results, generally ranged from 1MPa to 36MPa with some locally higher results of up to 60MPa.

The pH values on samples of the fill, residual silty clay and weathered sandstone ranged from 4.7 to 6.0, indicating acidic soil conditions. The sulphate contents ranged from 20mg/kg to 57mg/kg, the chloride contents ranging from <10mg/kg to 38mg/kg, and the resistivity ranged from 16,000ohm.cm to 51,000ohm.cm. Based on these results, the fill would be classified as 'non-aggressive' and the residual soil and bedrock would be classified as 'mild' exposure classification for concrete piles in accordance with Table 6.4.2(C) of AS2159-2009 'Piling – Design and Installation'. The fill, residual soil

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and bedrock samples would all classify as 'non-aggressive' exposure classification for steel piles in accordance with Table 6.5.2(C) of AS2159-2009.

Excavation and Groundwater: Due to the sloping nature of the site and the proposed stepped profile of the lower levels, excavations to a maximum depth of about 5m will be required to achieve the proposed Lower Ground Floor and Partial Basement level. Excavation to such depths is expected to encounter concrete, clayey fill, residual soils and weathered siltstone bedrock.

Excavation of the soils and upper rock of up to very low strength should be achievable using conventional excavation equipment, such as the buckets of hydraulic excavators. Some ripping of higher strength bands may be necessary if they are encountered within the weaker rock.

Excavation of bedrock of low strength or higher strength will require assistance with rock excavation equipment and is likely to be required for a limited depth along the south-eastern side of the site. Such equipment may comprise hydraulic rock hammers, ripping hooks, rotary grinders or rock saws. Hydraulic rock hammers must be used with care due to the risk of damage to the neighbouring school buildings and accessways. If hydraulic rock hammers are to be used the vibrations transmitted to the nearby buildings should be quantitatively monitored at least at the start of rock hammer operation to confirm that the transmitted vibrations are within acceptable limits. If during the initial monitoring the transmitted vibrations are close to acceptable limits full time monitoring may then be warranted. Reference should be made to the attached Vibration Emission Design Goals sheet for acceptable limits of transmitted vibrations. Where the transmitted vibrations are excessive it would be necessary to change to alternative excavation equipment, such as a smaller rock hammer, ripping hooks, rotary grinders or rock saws.

No groundwater seepage was encountered during auger drilling of the boreholes, but groundwater was measured within the monitoring wells between RL123.2m and RL113.8m, which is likely intersect the proposed lower ground floor level of RL121.1 and also the partial basement with a finished floor level of RL116m. The measured groundwater levels fall towards the north-west and given sites position on the slope we expect these groundwater levels represent ephemeral flow across the soil/rock interface and through joints within the rock. Therefore, we expect seepage to occur into the excavation and this would tend to occur along the soil/rock interface and through joints and bedding partings within the rock, particularly during and following rainfall and that initial flows will diminish with time. Any such seepage that does occur should be able to be controlled during construction using gravity drainage and conventional sump and pump techniques. In the long term, drainage should be provided behind all retaining walls and below the lowest floor slab. The completed excavation should be inspected by the hydraulic consultant to confirm that the designed drainage system is adequate for the actual seepage flows.

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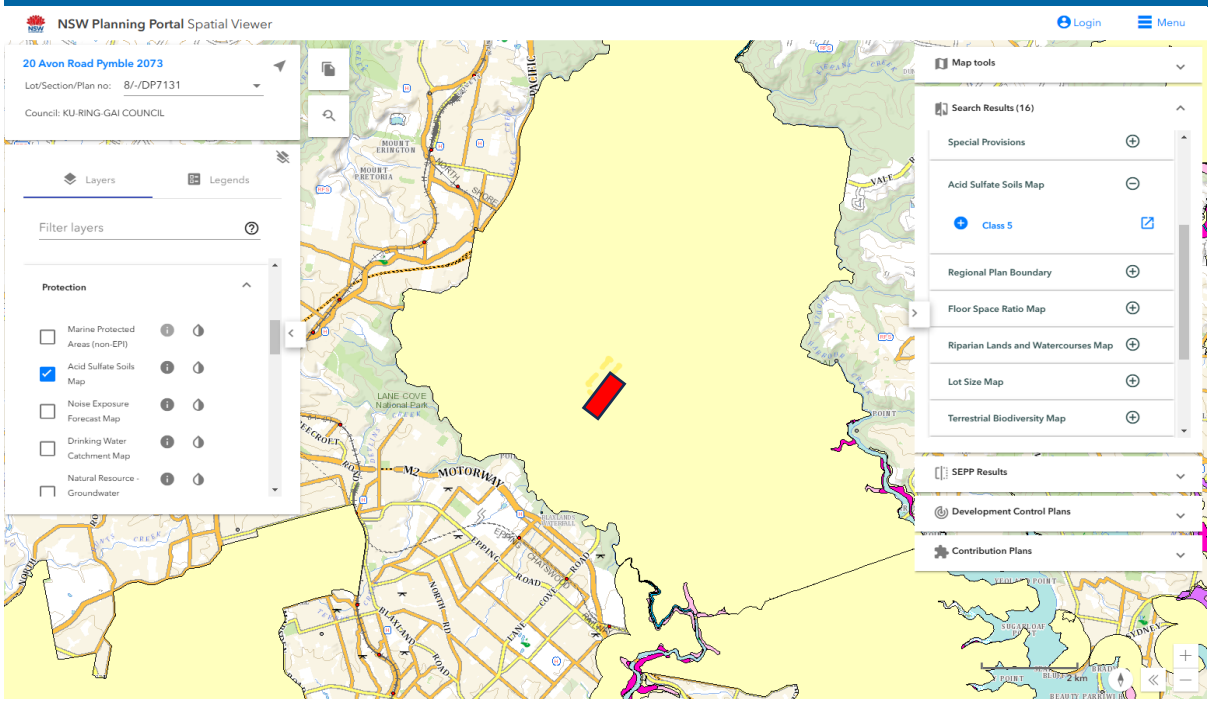
8.5 Acid Sulfate Soils

The geotechnical report provided by *Greywacke Geotechnics (Reference No: ECOE0977-GEO AA Rev03, dated 25 March 2025)* indicated that the subject site is located within a Class 5 of the Acid Sulfate Soils Planning Map. Summary of the sub-surface profile within the subject site is described below:

Figure 5: Acid Sulfate Soil Planning Map Excerpt



If the proposal is likely to disturb areas which meet any criteria (or are mapped as having a probability of acid sulfate soils being present) soil and water indicators should be checked to determine if acid sulfate soils are likely to be present.

If activities are proposed in locations which do not meet these geomorphic or site criteria and are not ins areas mapped as Class 1-4 on the planning maps, proponents can be confident that acid sulfate soils will not be present in the landscape. Soils of older geological age or those not derived from sedimentary deposition can be excluded from further investigation (unless very deep disturbances is proposed).

The topographic and geomorphic features of the subject site indicate that the occurrence of ASS at the proposed development site is LOW. As such, development and construction activities are UNLIKELY to be impacted by acid sulfate soil materials.

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8.6 Preliminary Assessment of Soils within the Proposed SIP Development Site

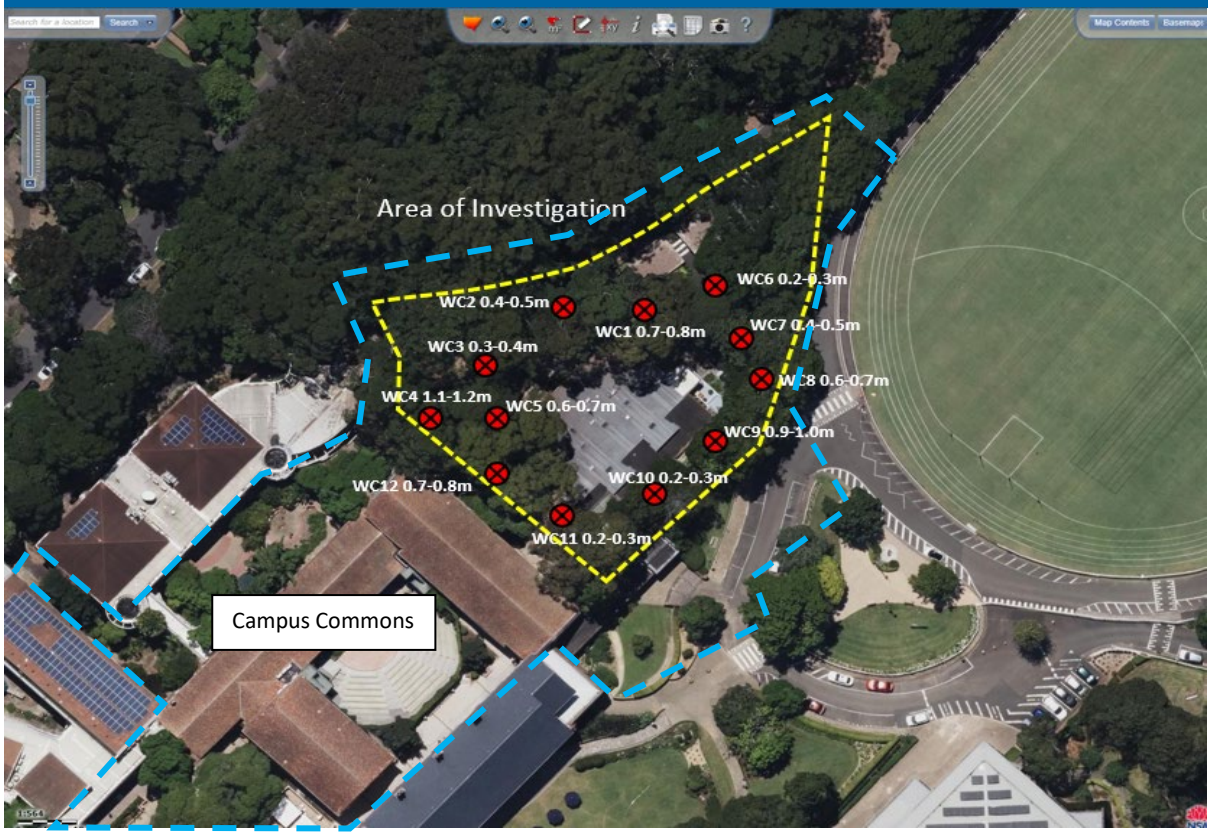
A preliminary assessment of insitu soils within the SIP development site within Pymble Ladies College, was undertaken by *ECON Environmental Pty Ltd Reference: 24-1683_revC, dated 13 March 2025* on Thursday 16 May 2024 to provide an initial classification of the insitu soils in preparation for the site's redevelopment. Twelve (12) insitu soil samples were collected for laboratory chemical analysis, from within the proposed SIP development site.

All twelve (12) soil samples were reported by the laboratory to have concentrations **BELOW** the HIL 'A' residential land use as per the NEPM 2013 guidelines.

Also, with reference to the *Waste Classification Guidelines 2014 – Part 1: Classifying Waste (NSW EPA, 2014)*, the insitu soils within the SIP development site of the site located at Pymble Ladies College, Avon Road, Pymble NSW, were classified as : ***General Solid Waste (non-putrescible).***

Refer to Attachment D for Report.

Figure 6: Preliminary Assessment of Soils within SIP Development Area



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8.7 Desktop Preliminary Site Assessment of Soils within the remainder of Common Campus

Based on the data and evidence collected during the preliminary assessment of soils within the SIP development area, as described in Section 8.6, a desktop preliminary review was then undertaken on the remainder of the Campus Commons area to determine if there was any potential areas of environmental concern within the remainder of the Common Campus area.

Based on historical data, there is historical evidence to suggest that importation of fill material within the subject site may had taken place in the past to level the site for school building developments within the Campus Commons area. However, evidence from the preliminary soil sampling assessment within the SIP development area, refer to Section 8.6, shows that it is unlikely that potential contaminants of concern would also be identified within the remainder of the Common Campus.

Subsequently, in accordance with the preliminary soil sampling undertaken within the SIP development area, in our opinion, it is also likely that the soils within the remainder of the Campus Commons will also potentially have concentrations BELOW the adopted site assessment criteria for HIL 'A', residential land use as per the NEPM, 2013.

However, a Preliminary or Detailed Site Investigation with soil sampling may be warranted to ensure that no contaminants of concern are identified within the remainder of the Commons Campus areas.

8.8 Contamination and Remediation

In accordance with Chapter 4 of SEPP (Resilience and Hazards) 2021, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.

- Preliminary Site Investigation

If required, provide:

- Detailed Site Investigation
- Remedial Action Plan
- Preliminary Long-term Environmental Management Plan

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9. POTENTIAL ENVIRONMENTAL IMPACTS

9.1 Impacts

The potential for impacts on soil and water will depend on several factors. Primarily impacts will be dependent on the nature, extent and magnitude of construction activities and their interaction with the natural environment. Construction-related risks associated with climate change such as more frequent extreme rainfall events, extreme heat and wind conditions and increased bushfire risks may also exacerbate the below impacts.

Potential impacts to soil and water quality from construction are summarised in Table 7.

Table 7: Summary of Potential Construction Soil and Water Quality Impacts

Aspect	Potential Impacts
Demolition of infrastructure	• Requirement to manage potential hazardous building materials during any demolition works – noting there will be significant demolition works at the subject site.
Continuing site establishment including setting up long term facilities, and trenching to facilitate utility adjustments	• Potential for dust or sediment from construction materials to be blown offsite, impacting neighbours • Erosion of the natural ground surface and subsurface through vegetation removal and structures requiring demolition • Transportation of soils, spoil, construction products (such as sand and aggregates) into surface water runoff and surrounding watercourses
Material storage including chemicals storage	• Potential leak or spill of petroleum hydrocarbons from refuelling and hydraulic hose bursts causing land and water contamination • Potential leaks and spills from water treatment chemicals used in the construction water treatment plants (the design for these plants is ongoing, hence the list of chemicals is not finalised yet)
Operation and management of site and heavy vehicles	• Potential leak or spill causing land and water contamination caused by the release of hydrocarbons • Potential for tracking of sediment onto public roads, leading to traffic safety issues and pollution of stormwater systems and receiving waters
Drilling works	• Potential for soil and sediment transport from cuttings and dust • Erosion due to temporary exposure around drilling locations from environmental conditions (wind/rain)
Concreting and grouting	• Potential for water quality impacts on surface and groundwater from concreting and grouting • Potential for spills of excess or waste concrete • Potential for waste concrete to be discharged into stormwater systems • Concrete spillage and runoff from washout areas
Material and spoil stockpiling, loading and haulage	• Mud tracking from site onto shared public roads • Sediment tracking onto roads • Stockpiled soils migrating offsite • Migration of sediment into nearby stormwater system and/or waterways

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Handling of contaminated soil, surface water and / or groundwater	• Potential for cross contamination during excavation, stockpiling, or during the mobilisation of contaminant laden sediment • Potential for mixing of stormwater and groundwater (possibly contaminated)
Operation of water treatment plants	• Water treatment plant failure leading to uncontrolled discharge or discharge into nearby stormwater system and/or waterways
Discharge of water detained onsite following heavy rainfall / localised flooding	• Potential for polluted water to be discharged offsite

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10. ENVIRONMENTAL MITIGATION AND MANAGEMENT MEASURES

Measures to manage soil and surface water quality impacts and reduce the risk of impact to sensitive receivers will be implemented throughout construction of the Project.

10.1 Standard Mitigation and Management Measures

The following sub-sections in Section 10 outline the management measures that will be implemented to address soil and surface water quality risks. As a minimum, the following will be incorporated at the construction site and documented in the Project's Environmental Control Maps (ECMs) of the CEMP.

Specific measures and requirements to meet the objectives of this CSWMP and to address impacts on soil and water are outlined in Table 8. As a minimum the following will be incorporated at each construction site and documented on the environmental control map, as applicable:

- Clean water diversions around disturbed site areas, stockpiles, and contaminated areas.
- Erosion and sediment control measures will be installed downstream of works, stockpiles, and other disturbed areas.
- Exposed surfaces will be minimised, and stabilised / revegetated as soon as feasible and reasonable upon completion of construction.
- Dangerous goods and hazardous materials will be stored within bunded areas with a capacity of 110 per cent of the maximum single stored volume.
- Chemicals will be stored and handled in accordance with relevant Australian standards.
- Known or potential areas of contamination
- Spill kits will be provided at the pre-cast yard, storage areas and main work sites in locations associated with chemical use

Table 8: Environmental Control Measures

ID	Mitigation and Management Measure and Project Site Requirements	Timing	Responsibility	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor				
1	Environmental incidents where material harm to the environment is caused or threatened will be managed in accordance with this CSWMP. These procedures include the initial actions required to be undertaken to avoid or minimise environmental harm and notify relevant Project personnel.	Construction	SEA/EA	CSWMP CEMP
2	Except as may be provided by an EPL, the Project shall be constructed and operated to comply with Section 120 of the POEO Act, which prohibits the pollution of waters.	Construction	SEA/EA	POEO Act
3	Training will be provided to relevant staff and subcontractors on sound erosion and sediment control practices and the requirements from this Plan through inductions, toolboxes, or general training. Specific targeted	Prior to and during construction	SEA/EA	CEMP

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	training for constructions teams involved in the management of soil and water will be provided before the commencement of construction. If key documentation is updated during the project, the training materials will be updated, and refresher sessions provided. Further details on training are provided in Section 11.2.			
4	Preparation of ESCP's for the site in accordance with Volume 2D of Managing Urban Stormwater: Soils and Construction (Landcom, 2004). These plans will be updated as required as the work progresses, and the sites change.	Prior to and during construction	SEA/EA	Landcom 2004 CEMP
5	Site water discharge will be designed so that the water will be of suitable quality for discharge to the receiving environment in compliance with the discharge criteria, the Project EPL, and the POEO Act.	Design	Project Engineers	CEMP
6	All erosion and sediment controls will be installed in accordance with the CEMP and the Blue Book. This may include (but not limited to): • Geotextile linings, soil binders, tarps or similar will be used to provide temporary surface protection were appropriate • Designing and constructing diversion banks upslope of areas to be disturbed, where practical, to direct clean water runoff away from disturbed areas and allow clean surface water to return to natural watercourses • Locating stockpiles away from traffic areas and watercourses • Disturbed ground and exposed soils will be temporarily stabilised during periods of site inactivity, for more than ten days, to minimise the potential for erosion • Key management structures such as sediment traps and clean water diversions will be installed as interim measures to assist in effective site management before more permanent controls are installed • Level or gently sloping areas will be selected as stockpile sites to minimise erosion and potential soil loss where possible • Staging of works where possible, when working adjacent to and within particularly sensitive areas The specific management and mitigation measures will be defined as the construction layouts are completed and the ECMs are developed. This will also be done in accordance with the management and mitigation measures provided in the CEMP.	Prior to and during construction	SEA/EA	Landcom 2004 CEMP
7	Works will be designed and programmed to minimise the extent and duration of disturbance to vegetation	Prior to and during construction	Project Engineers	SEAR SSDA CEMP
8	Minimise the extent of ground disturbance and exposed soil where practical to minimise the potential for erosion	Construction	SS	Best Practice
9	Measures will be implemented to minimise dust, soil or mud from being deposited by vehicles on public roads. This includes: • Site access and egress points to be fitted with wheel wash facilities and rumble grids to prevent tracking of sediment off site • Streetsweepers to be used to manage residual sediment tracking	Construction	SS	CEMP

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	• Cleaning of hardstand areas as soon as practically possible • Washing/sweeping/cleaning of tyres by any other means necessary as required • Maintaining cleanliness of internal haul routes, particularly access/egress points to mitigate mud tracking The same mitigation measures apply in full for trucks transporting material offsite.			
10	Before commencement of any construction that would result in the disturbance of moderate to high-risk contaminated sites, investigation and management in accordance with the requirements of guidance endorsed under section 105 of the CLM Act will be completed. This may require further investigations in areas of potential contamination identified in the Project footprint. If contamination posing a risk to human or ecological receptors is identified, a Remediation Action Plan (RAP) will be prepared. The location of contaminated areas will be documented in the contaminated land register and conveyed to workers prior to working in these areas. If there are specific HSE risks these will be managed by the Health and Safety, and or Environment Manager and appropriate controls put in place. The contaminated land management process is detailed in Section 10.4.	Construction	SEA/EA	SEAR SDDA CEMP
11	An Unexpected Contaminated Land and Asbestos Finds procedure has been developed and is to be implemented throughout construction. This is included in Attachment C.	Prior to and during construction	SEA/EA	CSWMP
12	Spoil stockpiles will be managed to reduce potential impacts associated with dust generation, erosion and sedimentation including by battering slopes or wetting to keep moist. Stockpiles will also be managed to separate clean and contaminated spoil. Stockpile management will include identification measures such as signage detailing information such as source and classification..	Construction	SS/SEA/EA	CEMP
13	Hydrocarbon spill kits must be kept onsite, and all staff inducted in their use. Used spill kits will be replaced as soon as practical.	Construction	SS	CEMP
14	Storage of chemicals on site will occur in accordance with suppliers' instructions and relevant Australian Standards and legislation including the: • *Work Health and Safety Act 2011* (NSW) • Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005) • Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (Department of Planning, 2011) • AS 1940-2004 The storage and handling of flammable and combustible liquids • AS/NZS 4452:1997 The storage and handling of toxic substances • AS/NZS 5026:2012 The storage and handling of Class 4 dangerous goods • AS/NZS 1547:2012 On-site domestic wastewater management	Construction	SS	Best Practice

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	• Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (EPA 1997).			
15	All chemicals stored on site must be securely sealed and bunded to 110% of their capacity. Incompatible chemicals will be stored separately in accordance with manufactures specifications and compatibility chart.	Construction	SS	Best Practice
16	Ensure all chemicals are clearly labelled. Clean and reattach labels as necessary and ensure any pipe work or plant that contains hazardous chemicals is identified through a label, sign or other measure.	Construction	SS	Best Practice
17	An up-to-date register of hazardous chemicals and dangerous goods will be kept onsite at all times	Construction	SEA/EA	Best Practice
18	The refuelling of plant and maintenance of machinery will be undertaken in designated bunded areas where possible, and generally away from sensitive receiving environments (i.e streams). Refuelling will be attended at all times.	Construction	SS	Best Practice
19	A Water Reuse Strategy will be prepared prior to the commencement of construction.	Prior to construction	SEA/EA	CEMP
20	Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Suitable areas will be hardstand or lined areas that are appropriately stabilised and bunded, with sufficient area for stockpile storage.	Prior to and during construction	SS	Best Practice
21	Vehicles will be properly maintained to minimise the risk of fuel/oil leaks and routine inspections of construction equipment will be undertaken to identify any fuel/oil leaks and repairs made as required. Plant will be inspected prior to arriving on site to ensure it is fit for operation. Daily pre-start plant checks will be undertaken to check for oil, fuel or other liquids leaks.	Construction	SS	Best Practice
22	All pills or leakages will be immediately contained and absorbed	Construction	SS	Best Practice
23	Identify the appropriate design standard for flood mitigation based on the duration of construction, proposed activities and flood risks	Design	Project Engineers	SEAR SDDA CEMP
24	The rainfall forecast will be monitored to identify and communicate the risk of potentially flooding rains	Construction	SEA/EA	Best Practice

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10.2 Erosion and Sediment Control Plans

Erosion and sediment control measures will be guided by the Erosion and Sediment Control Plan (ESCP) procedure in Attachment 1, which has been developed in accordance with the requirements of Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Managing Urban Stormwater: Soils and Construction Volume 2A and 2D (DECC 2008) (the Blue Book).

In accordance with the ESCP procedure (Attachment 1), an ESCP will be developed and implemented prior to the commencement of construction at each construction site. Depending on the size and complexity of each construction site, it may be necessary to develop ESCPs for subareas. These will be developed as a Hold Point prior to the commencement of intrusive activities/ground disturbance.

Progressive Erosion and Sediment Control Plans would be developed, whereby they are gradually updated to reflect the changing construction progress and site conditions. The application of best practice erosion and sediment control will be based upon the appropriate integration of three groups of control measures:

- Drainage control measures
- Erosion control measures
- Sediment control measures.

10.3 Contamination Management Actions

Where contamination is known or expected, mitigation and management measures will be implemented to manage and prevent the spread of contamination within the construction sites. These measures will be site specific and where appropriate will be documented in ECMs for the individual sites. Mitigation and management measures will include the following:

- Establishment and maintenance of a Contamination Register and plans to list and identify contamination locations, proposed future land use, and track investigations and their findings
- Tracking of spoil both within and off site as detailed in the Spoil Management Plan
- Managing onsite stormwater runoff in accordance with TfNSW Technical Guideline EMS-TG-010: Stockpile Site Management and the Blue Book
- Stockpile management (e.g.siting/location, stockpile height, etc) as detailed in the Spoil Management Plan
- Establishing and maintaining erosion control and sediment capture measures
- Diversion of offsite stormwater
- Signage and exclusion zones
- Odour controls (if required).

The management of surface water is discussed in detail in sections below. However, the intent is to manage clean surface water (from rainfall events) separately from groundwater, whether contaminated or not. Surface water that falls directly into excavations and that may come into contact with contaminants of concern will be treated within the associated water treatment plant (depending on the construction site).

Where contamination is likely to be encountered, workers will wear appropriate Personal Protective Equipment (PPE). The PPE will depend on the contaminant type and the works to be undertaken. Appropriate PPE will be decided upon in consultation with an Occupational Hygienist. Workers will also participate in appropriate inductions and toolbox meetings prior to working in contaminated areas.

In accordance with this CSWMP, an Unexpected Finds Procedure has been prepared for the commencement of construction and will be followed should unexpected, contaminated land or asbestos (or suspected contaminated land or asbestos) be excavated or otherwise discovered during construction. This is included as Attachment C. The procedure will apply to unexpected finds or contamination identified outside the areas that are subject to the DSIs. Unexpected finds will be documented in a contaminated land register for the Project.

10.4 Waste Classification and Offsite Disposal

The waste classification and disposal will be carried out in accordance with relevant standards and requirements, including the NSW EPA (2014) Waste Classification Guidelines – Part 1: Classifying Wastes. Section 3.1 of the Spoil Management Plan defines targets for reuse and recycling including specific targets for the following material classifications:

- Virgin excavated natural material (VENM) – targeting 100% reuse
- Soils without a resource recovery exemption and order - 100% that is permitted to be beneficially reused in accordance with Project Specifications, RAP, Legislation, and relevant Guidelines
- Potential or Actual Acid Sulphate Soils (PASS/ASS) - 100% that is permitted to be beneficially reused in accordance with Project Specifications, RAP, Legislation and relevant Guidelines.

10.5 Salinity

Soil salinity refers to the movement and concentration of salt in soils because of weathering rock materials, historic inland seas and deposition of salt from the ocean onto land by wind or rain. Saline soils can degrade ecosystems and habitats and reduce the productive agricultural capacity of land. The probability of encountering saline soils within the project footprint is low.

10.6 Water Storage and Reuse

Water management addressed within this SWMP will focus on surface water collected within the construction site footprint. Water generated from construction activities including stormwater collected within basins, and other process water are assessed separately. This is due to the majority of these flows coming from groundwater sources/underground processes.

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Where practicable, any water collected in excavations / work sites will be reused within the construction site (e.g., dust suppression, watering retained vegetation, re-use in wheel washes and/or wheel baths). In-line with the CEMP, reuse onsite will further support the following water resource management objectives:

- Minimise demand for, and use of potable water
- Maximise opportunities for water re-use of rainwater, captured stormwater, wastewater and groundwater.

Where water is collected in detentions basins, holding tanks and/ or excavations, this will be tested and treated, as detailed in the CEMP. Sediment basins proposed for the Project, however their design and associated controls should would be confirmed during detailed design and would generally be in compliance with the requirements detailed in CEMP.

It is not anticipated that odour will be an issue for stormwater that is collected from the surface of the sites. Generally, stormwater falling on hardstand will be diverted through the ERSED controls. ERSED plans will be developed by the Sites Environmental Representative and signed off by the Site Supervisor and Project Engineer. There will be limited opportunity for contact with materials that may result in odour. As detailed above, stormwater falling in excavations will be treated within one of the construction water treatment plants.

Concrete equipment will be washed down in designated lined or bunded areas. Waste products will be left to harden and then the solid material beneficially reused. Concrete washout water would be contained within the washout area and allowed to either evaporate or harden. In the event that capacity is reached, it would be removed by vacuum truck or pumped to an appropriately bunded container. This is in accordance with the Waste Management Plan.

10.7 Water Reuse Strategy

The strategy aims to minimise the use of both potable and non-potable water.

The water reuse strategy considers the following activities:

- Operation of site facilities
- Dust control across each construction site
- Trenching and piling activities
- Subgrade treatments
- Establishment of landscaping
- Ongoing water demand for operation and maintenance

Examples of potential initiatives include the following:

- Smart metering – to track water discharge and reuse
- Water efficient controls, fixtures, and fittings (e.g., push button taps)
- Rainwater harvesting

- Reuse of non-potable water (e.g., treated groundwater and harvested rainwater) for activities such as dust suppression, landscaping, wheel washes, wheel baths, cleaning, laundering
- Water efficient construction methods and equipment
- Specifying recycled water be used within offsite concrete batching

The Water Reuse Strategy includes, but is not limited to:

- evaluation of reuse options
- details of the preferred reuse option(s), including volumes of water to be reused, proposed reuse locations and/or activities, proposed treatment (if required), and any additional licences or approvals that may be required
- measures to avoid misuse of recycled water as potable water
- consideration of the public health risks from water recycling
- time frame for the implementation of the preferred reuse option(s).

10.8 Water Quality and Discharge

Water collected in excavations will be appropriately treated prior to discharge to avoid potential contamination or local stormwater impacts.

A permit will be raised for every discharge event and will monitor compliance with the criteria provided. Water discharges to stormwater or waterways will comply with the requirements of the POEO Act and requires written approval of the Environmental Manager (or delegate) as part of the Discharge Permit process.

10.9 Groundwater Management

Some groundwater seepage into excavations may occur and will be managed as detailed in this CSWMP. Contaminated groundwater will be managed in accordance with the RAPs, the Groundwater Management Plan and Groundwater Monitoring Programs (where relevant).

10.10 Flooding during Construction

Potential flooding during the construction phase will be considered by the design team in the temporary works design, with appropriate safeguards implemented during construction.

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11. COMPLIANCE MANAGEMENT

11.1 Roles and Responsibilities

The table below defines the roles and responsibilities of personnel in charge of the soil and water management of the project:

Table 9: Management Roles and Responsibilities

Roles	Authority and Responsibilities
Environmental and Sustainability Lead (or Manager)	• Develop and implement the CSWMP • Oversee all required activities outlined in Section 7 and in accordance with this sub-plan • Oversee compliance tracking and reporting • Oversee the keeping of all environmental records • Engage suitably qualified consultants to support implementation of this sub-plan • In consultation with the Project Director and Site Supervisor, oversee the investigation and reporting of environmental incidents • Regularly engage with the key stakeholders and other interface contractors to achieve environmental alignment. • Responsible for management of system documents and for auditing site activities against this procedure
Senior Environmental Advisor	• Have a responsibility to comply with the requirements of this CSWMP and to manage their works accordingly. • Personnel responsible for undertaking specific management actions as specified in this CSWMP • Complete inspections and monitoring. • Complete reporting (refer to in this CSWMP) • Prepare ECMs to outline the controls in this sub-plan relevant to each work activity • Respond to inquiries raised by the ER or Client's representatives • Attend inspections with the ER, the Client, or other stakeholders • Respond to environmental incidents and non-conformances
Environmental Advisor	• Delivery of toolbox / prestart presentation (or other specific training) to inform work crews of the controls documented in the CSWMP • Perform regular on-site liaison and inspections • Provide environmental advice and assistance to construction personnel • Manage implementation of CSWMP • Respond to environmental incidents and non-conformances • Plan, manage and execute contaminated land strategy • Investigate the extent (horizontal and vertical) of soil salinity and ASS • Prepare site-specific action management plans for soil salinity or ASS that will be disturbed by the works
Soil Conservationist (Certified Professional in Erosion and Sediment Control)	• Provide specialist advice and input on an ad-hoc basis as instructed by the principal contractor. • Specialists may include external consultants, or specialists within the principal contractor. • Duties would typically include the review of Erosion and Sediment Control Plans in accordance with the Blue Book including calculations of soil loss from site and basin sizing

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Environmental Representative (ER)	• Endorse this CSWMP • Endorse the Construction Monitoring Programs
Site Auditor	• Review key documents to ensure contamination management activities, including fieldwork and reporting, are completed in accordance with relevant guidance • Review SAQP and DSI reports • Review and approve the RAP and any revisions to the RAP • Review and approve the Validation Report • Prepare and issue Site Audit Statements and Site Audit Reports
Construction Manager	• Ensures compliance with this CSWMP, procedures and ECMs • Work collaboratively with environment teams to ensure the mitigation and management measures in this CSWMP are integrated into construction works • Ensure that soil and water management impacts are always considered in forward planning and scheduling
Site Supervisor	• Install and maintain environmental control in accordance with this CSWMP and SSDA • Attend inspections with the Environmental Coordinator, Pymble Ladies College or other stakeholders • Implement corrective actions raised during environmental inspections in agreed timeframes • Obtain and comply with Water Discharge Permits prior to any discharge of water from site • Notify the Environmental Coordinator of any observations of Visual difference in water quality (turbidity) from upstream to down of works or site discharge or other pollution event evident in waterway including discolouration, fish kill or strong odour
All personnel	• Notify Site Supervisor of any observations of visual difference in water quality (turbidity) from upstream to down of works or site discharge or other pollution event evident in waterway including discolouration, fish kill or strong odour

This CSWMP would remain in place and be maintained for the duration of construction works within the subject site, located at 20 Avon Road, Pymble NSW.

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11.2 Training

All employees and contractors will undergo site induction training relating to soil and water management issues. The induction training will address elements related to soil and water management including:

- Relevant details and requirements of this SWMP, including attachments
- Relevant legislation and guidance
- Roles and responsibilities for soil and water management
- Procedures to be implemented in the event of an unexpected discovery of contaminated land
- Water quality management and protection measures
- Flood mitigation measures
- Conditions of environmental licences, permits and approvals
- Incidence response and reporting procedures
- Maintenance of environmental controls
- Water discharge requirements
- Management of contamination/exclusion zones
- Details of ECMs.

Targeted training in the form of toolbox talks or tailored training sessions will also be provided to personnel with a key role in soil and water management. Specific training may include:

- Spill response training for all operational personnel to ensure all emergency response requirements are clearly communicated and understood.
- Pollution Incident Response Management Plan (PIRMP) requirements for construction management, including EPL reporting requirements.
- Blue book (ERSED) requirements and discharge procedures for all surface and civil workforce (including water testing and treatment).
- Water treatment plant management (which may include a verification of competency (VOC) or similar process for water treatment plant operators to maintain compliant operations across all shifts.

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11.3 Monitoring, Reporting and Inspections

General monitoring, inspection, and reporting requirements are outlined in Table 9. Additional requirements and responsibilities in relation to monitoring and inspections are documented in the CEMP.

Table 10: Inspection and Monitoring Requirements

Title	Scope	Frequency	Responsibility	Records / Reporting
Monitoring				
Surface Water Quality Monitoring	Surface Water Quality Monitoring Program in accordance with CEMP	In accordance with the CEMP	Senior Environmental Advisor	CEMP
Weather Forecasts	Monitoring of weather observations from the BoM Sydney Olympic Park Aws (Archery Centre) weather station (site number 066212) to determine when adverse weather conditions are predicted. Specific notifications to the construction teams will be made if rainfall exceeding the 5-day 85th %tile (36.6 mm) rainfall depths are forecast. Monitoring weather using the real-time on-site weather stations installed at the subject site	Weekly forecast Daily updates when adverse weather is predicted	Environmental Advisor	Project Alerts (e.g., email distribution)
Weather observations	Monitoring of weather observations from the BoM Sydney Olympic Park Aws (Archery Centre) weather station (site number 066212) Monitoring weather using the real-time on-site weather stations installed at the subject site	Monthly summary placed into Annual Report	Environmental Advisor	Construction Monitoring Report (as deemed necessary)
Inspections				
Weekly inspections including erosion and sediment control measures	Inspection of the environmental controls and implementation of the soil and water quality mitigation measures outlined in Attachment 3 including: • Erosion and sediment controls • Measures to prevent tracking of material onto the surrounding road network • Construction water reuse and discharge inspection practices • Chemical and fuel storage and spill response readiness • Refuelling areas • Contaminated land management activities • Concrete disposal and washout facilities	Weekly Ad following significant rainfall events (greater than 20mm in 24 hours)	Senior Environmental Advisor	Weekly Environmental

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	• Management of potential and/or actual acid sulfate soils (if present)			
Erosion and sediment control measures	Ensure that all erosion and sediment control measures installed on the premises are inspected and works undertaken to repair and/or maintain these controls if practicable and safe to do so.	• Weekly (even if work is not occurring onsite) • Daily during periods of rainfall • Immediately before site closure greater than 48 hours • 24 hours prior to a rainfall event. • Within 24 hours of the cessation of a rainfall event causing: • runoff to occur on or from the premises	Environmental Advisor	Environmental Inspection Checklist
Site Auditor Inspections	As required to review and approve documentation associated with contamination investigations and remediation	As required	Site Auditor	Details recorded within the Site Audit Memos or within Site Audit Reports
Inspections	Monitor the implementation of the SWMP in accordance with CEMP	Regularly (TBD by the Environmental Representative)	Environmental Representative	Incorporated within the ER Monthly Report

11.4 Auditing

Audits (both internal and independent) will be undertaken to assess the effectiveness of environmental controls, compliance with this CSWMP, CEMP and other relevant approvals, licenses, and guidelines. These audits will be undertaken at planned intervals to provide information on whether the Project:

- Is meeting its compliance obligations
- Conforms to this sub-plan
- Determines if this sub-plan is effectively implemented and maintained.

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11.5 Environmental Incidents

All Incidents will be classified by the Environment and Sustainability Lead and Environment Manager in consultation with the Project Director.

All incidents will be reported in accordance with the Environmental Incident and Non-compliance Reporting Procedure, relevant licenses and legislation.

The report Environmental Incident And Non-Compliance Notification Report will be completed, and details of the incident will be entered into an electronic incident register, which is to be always accessible from site. This will be done through the Project Safety and Environmental Manager Software. The Incident Register will include:

- Details of any incidents where impacts to soil and surface water quality causes public nuisance
- Details of any accidental impacts to soil and surface water quality, including accidental spills, unexpected contaminated land and unapproved ground disturbance
- Details of any other soil and surface water quality related incidents.

Examples of incidents as they relate to soil and surface water quality may typically include:

- Dispersion of contaminated material into nearby waterways
- Generation and dispersion of sediments during uncontrolled construction activities
- Flood events.

The Project Director, Construction Manager and relevant Project Manager will be made aware of the incident as soon as possible.

In the event an actual or potential incident is reported through the Community Complaints line, the Environment Manager (or delegate) will be contacted immediately to respond and investigate.

The approved ER will review all relevant notifications of incidents.

Where relevant, incidents will also be notified to the environmental consultant and Site Auditor for advice, assessment (if required) and to ensure appropriate inclusion in the Contaminated Site Audit.

11.6 Complaints Register

All complaints made by the community and stakeholders will be managed in accordance with the CEMP requirements.

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12. REVIEW AND IMPROVEMENT

12.1 Continuous Improvement

The Project Management Team will review the status and adequacy of the SWMP including the CEMP and CEMP Sub-plans. The objective of the review will be to ensure that it meets current Project requirements as well as relevant environmental standards.

Continuous improvement of this SWMP will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives, and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any nonconformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

In order to ensure continual improvement and prevent recurring issues, this sub-plan will be reviewed in response to:

- Corrective actions arising from non-conformance, incidents, or audits.
- Opportunity for improvement in environmental management performance which may be identified by the project team, ER or the client.

Review of this SWMP will occur annually as a minimum, or as needed in consultation with the client and the ER. A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the document control procedure outlined in the CEMP.

12.2 Document Updates

The processes described above may result in the need to update or revise this CSWMP. This will occur annually as a minimum, or as required, and may only be approved by the Environmental Manager, or delegate.

Where minor amendments are required to this SWMP, the revised SWMP will be issued to the ER for review and endorsement in accordance with SEAR SDDA.

12.3 Distribution

All personnel and contractors will have access to this SWMP via the project document control management system.

The approved SWMP will be made publicly available on the project director's website soon after its approval or before the commencement of any work to which it relates.

The document is uncontrolled when printed.

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13. WORK HEALTH AND SAFETY

A Work Health and Safety (WHS) plan is an essential part of all remediation projects, to ensure the health and safety of all personnel working on or visiting the site. All remediation work would be undertaken in accordance with the provisions set out by the Work Health and Safety Act (2011) and associated Regulations 2017, and any other regulations or directions set out by regulatory authorities. Prior to commencing any remediation works, a specific WHS Plan would be prepared by the Remediation Contractor covering the following minimum aspects:

- Method statements,
- Identification of the remediation area and exclusion zones,
- Induction of personnel,
- Personal protective equipment (PPE),
- Hazard identification / locations,
- Identification of contaminants of concern and their physical and toxicological properties,
- Description of exposure pathways and personal protection requirements,
- Location of all underground/aboveground services,
- Details of specific work practice procedures to be followed within the designated contaminated areas,
- Monitoring protocols to identify a potentially hazardous practice,
- Emergency information, and
- Incident reporting.

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ATTACHMENT A: EROSION AN SEDIMENT CONTROL (ESCP) PROCEDURE

This procedure outlines the fundamental principles and process that will be followed in the development of Erosion and Sediment Control Plans to ensure they are planned and implemented in accordance with Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004 (reprinted 2006) (the "Blue Book") Volume 1, 2 and Volume 2D Main Roads Construction (DECCW 2008).

It is noted that the Blue Book is a comprehensive technical guideline, and this procedure only addresses the key management principles that are likely to be relevant to the Project works. Where relevant, other erosion and sediment control techniques that are outlined in the Blue Book, however not included in this procedure, may be used.

Preparation of Erosion and Sediment Control Plans

Erosion and sediment control plans (ESCP) will be prepared prior to the commencement of construction at each surface worksite in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Volume 2 (Department of Environment and Climate Change, 2008).

ESCPs will be prepared and maintained by Environmental Coordinators and progressively updated as construction progresses and the site conditions change.

A template ESCP is provided in Attachment D1 of this procedure.

Key Management Principles

Managing Urban Stormwater: Soils and Construction (Landcom, 2004) Volume 1 and Volume 2 and Volume 2D: Main Road Construction, DECC, 2008 is a comprehensive guideline that will be used as reference in the planning and implementation of the erosion and sediment control measures. Table: provides a summary of the key principles of the Blue Book. It is acknowledged that this table does not cover all the requirements of the Blue Book.

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Table A: Key erosion and sediment control principles	
Key Principle	Control Measures
Minimise extent and duration of disturbance	• Limit the extent of disturbance to the area required for construction. • Clearly delineate the limits of disturbance on ESCP. • Program works to minimise the duration of works in sensitive environments (e.g. in stream works) • Before clearing commences, identify the limits of clearing and use on site markers to delineate clearance limits. • Staging of clearing operations where possible • Maximising and maintaining surface vegetative cover • Special emphasis on management of construction activities adjacent to creeks or areas of concentrated flows (e.g. drains) • Use of temporary covers on stockpiles when unused, and temporarily exposed soil surfaces.
Divert non-site water away from disturbed areas	• Intercept, divert and safely dispose of 'clean' water from undisturbed areas so that it does not flow onto the works. • Pass 'clean' water through the site without mixing it with 'dirty' water from disturbed areas. This may require temporary solutions to convey water across a working site.
Conserve topsoil	• Strip and stockpile topsoil for use in reinstatement.

Erosion control management of soils	• Protection of disturbed areas as soon as practical. Short to medium term protection (0–3 months) may include:
	  ○ Soil polymer application
	  ○ Geotextiles/linings/coverings
	Longer term protection may include:
	  ○ Geotextile linings or
	  ○ Topsoil, jute matting and seeding with cover crop
	  ○ Hydro mulching / hydroseeding.
	  ○ Geotextile or plastic linings areas of concentrated flow such as flow channels or batter chutes.
	  ○ Stockpiling in low hazard areas clear of watercourses.
	  ○ Additional protection to be afforded with vegetation, diversion banks and sediment fences if required.

Sediment control	• Utilisation of cleared/mulched vegetation for sediment traps and filters. • Installation of diversion bunds or sediment fences around the perimeter or work areas. • Use of sandbags / coir logs / rock checks to break slopes. • Construction of control measures as close to the potential source of sediment as possible. • Controlling the deposition of mud and soil material onto local road (wheel wash / rumble grids).

Sediment basins	• Sediment basins will be designed by a hydrologic engineer.
	• Sediment basin management of turbid water immediately after rain as required with one or a combination of:
	  ○ Flocculation with gypsum (or approved alternative flocculant)
	  ○ Pump-out for construction purposes or dust control
	• Water will not be released from sediment basins prior to achieving EPL discharge criteria
	• Regulating water quality during dewatering activities (e.g., filtering techniques and flocculation with gypsum or approved flocculant).

Stormwater pit controls	• Installation of stormwater pit control around live stormwater pits.
Rapid stabilisation of disturbed areas	• Progressive revegetation of disturbed areas utilising appropriate species at the completion of works.

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Inspection, Review and Audit

Inspections will also take into consideration the best practice requirements (IECA, 2008). Best practice site management requires all ESC measures to be inspected by GLC' s nominated representative at least daily when rain is occurring, within 24 hours prior to expected rainfall, and within 18 hours of a rainfall event of sufficient intensity and duration to cause onsite runoff (IECA, 2008). Additional inspections will be undertaken following significant rainfall events (greater than 20 mm in 24 hours). Such inspections must check:

- Daily site inspections (during periods of runoff producing rainfall)
    - All drainage, erosion, and sediment control measures
    - Occurrences of excessive sediment deposition (whether on-site or off-site)
    - All site discharge points
- Weekly site inspections (even if work is not occurring on-site)
    - All drainage, erosion, and sediment control measures
    - Occurrences of excessive sediment deposition (whether on-site or off-site)
    - Occurrences of construction materials, litter or sediment placed, deposited, washed, or blown from the site, including deposition by vehicular movements
    - Litter and waste receptors
    - Oil, fuel, and chemical storage facilities
- Prior to anticipated runoff producing rainfall
    - All drainage, erosion, and sediment control measures
    - All temporary flow diversion and drainage works
- Following runoff producing rainfall
    - Treatment and de-watering requirements of sediment basins
    - Sediment deposition within sediment basins and the need for its removal
    - Condition of all drainage, erosion, and sediment control measures
    - Occurrences of excessive sediment deposition (whether on-site or off-site)
    - Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements.

Competency, Training and Awareness

Persons involved in the preparation and review of ESCPs would have completed the IECAApproved Erosion and Sediment Control Workshops, Blue Book Training.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in soil and water management including:

- ERSED control planning and installation methodology
- Stockpile location criteria
- Sediment basin construction
- Sediment basin maintenance
- Preparedness for high rainfall events.

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ATTACHMENT B: CONSTRUCTION SITE WATER REUSE AND DEWATERING PROCEDURE

Introduction

This procedure regulates both onsite reuse of water and provides dewatering guidance.

Dewatering, for the purposes of this procedure, is any activity that involves the removal of ponded stormwater or infiltrated groundwater from any location on site and the subsequent reuse or discharge of that water.

Captured stormwater and infiltrating groundwater will fill sedimentation controls and pool in low lying areas of construction formations and excavations. These areas will be dewatered to maintain the effectiveness of sedimentation controls and to ensure formations and excavations are not adversely affected by long periods of inundation.

Legislative Obligations

The *Protection of the Environment Operations (NSW) Act 1997* (POEO Act) is the key piece of environment protection legislation in NSW, administered by the Environment Protection Authority (EPA). Under section 120 of this Act, the pollution of waters, no matter how minor, is illegal.

Under the POEO Act, the pollution of waters is broad and captures the introduction of anything that alters the physical, chemical or biological condition of the receiving waters. Waters include the whole or any part of:

- Any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea), or
- Any water stored in artificial works, any water in water mains, water pipes or water channels, or any underground or artesian water

To avoid causing pollution and breaches of section 120, any water discharged from site must be of the same quality, or better, than the quality of the receiving waters (at the time of discharge).

Water Reuse – assessing potential reuse opportunities.

In accordance with the water reuse strategy, opportunities for reuse of water generated through construction activities will be assessed. Onsite reuse of stormwater or detained groundwater should be considered as the first option for dewatering activities. Re-use of groundwater or stormwater on site however, would occur following treatment from the water treatment plan. Onsite reuse may include applications such as dust suppression, earthworks compaction, vegetation establishment/rehabilitation, and plant/vehicle wash-down. Reuse of water on the construction site may reduce the need for imported or extracted water and provide a lower risk to the environment than direct discharge to the environment.

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Where water is to be re-used on site the Water Discharge and Reuse Permit will be utilised.

Discharge Criteria

Water Pollution Impact Assessment

The assessment takes into consideration the environmental values of the receiving waterway(s) to establish suitable discharge criteria to maintain the identified NSW Water Quality Objectives.

The Water Pollution Impact Assessments will prepared in consultation with the EPA and are consistent with the National Water Quality Guidelines, with a level of detail commensurate with the potential water pollution risk. Separate Water Pollution Impact Assessments will be prepared for each discharge point as required. The Water Pollution Impact Assessment will be termed the Water Discharge Impact Assessment for consistency with the EPA's adopted nomenclature.

Correlating Total Suspended Solid (TSS) with Turbidity

Consideration may be given to establishing a site-specific relationship between TSS concentrations and turbidity, measured in nephelometric turbidity units (NTU). This allows the TSS and turbidity to be inferred from an NTU reading. The benefit of using NTU is that it can be quickly measured onsite with a hand-held meter, whereas water quality meters that measure TSS are expensive and the results from samples sent for laboratory analysis will not be available immediately. However, NTU is affected by factors other than suspended solids, such as colour, e.g. tannins may alter the NTU reading.

As such, a correlation analysis must be undertaken between TSS and NTU that is specific to the site to confirm the relationship. The correlation must be determined via analysis by a NATA accredited laboratory. Thorough records of the site-specific correlation must be kept, and any recommendations and/or limitations should be documented as part of the CEMP. Further information on this can be found in Attachment 5 of the Blue book.

Discharge Location

On site discharge locations were selected to avoid the potential for scouring, prevent water from flowing back onto site and avoid sensitive areas (e.g. wetlands). Energy dissipation must be provided at all dewatering discharge points.

Discharge Point Register

Dewatering locations will be identified though detailed design, in development of the ESCPs and during construction as earthworks and construction phases result in changing site drainage conditions. These may include:

- Sedimentation controls (e.g., sedimentation basins and sumps)

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- Excavations
- Culvert and drainage constructions
- Low lying areas of road formations.
- All proposed dewatering locations must be identified on the EPL Discharge Point Register to Be maintained by the EPA. The EPA must be notified at least 48hrs prior to a discharge point being added or removed from the Discharge Point Register.

Locational Criteria

Consideration will be given to the following factors when determining a suitable offsite location:

- Direction of groundwater flow – recharging groundwater that will subsequently flow either back onto site, into excavations or low-lying areas should be avoided.
- Erosion – the receiving area must have complete groundcover (e.g., grass) and established vegetation to minimise the risk of erosion.
- Flora and fauna – water must not be discharged to areas where there is potential to have an adverse effect on any flora or fauna species.
- Flooding – the receiving area must have the infiltration capacity to receive the volume of water to be discharged, without causing flooding or significantly increasing the risk of flooding should subsequent rainfall occur.

Treating Water Prior to Discharge

The treatment and discharge of water on-site is managed through the Permit to Discharge process. Treatments will be designed to achieve the water quality outcomes specified in the Project EPL, as well as to cater for the time constraints that may be applicable to the activity (i.e., 5 day management period for sedimentation basins). Treatments should be applied to waters as soon as the requirement is determined and should be applied only by experienced, trained and competent personnel. Care needs to be taken to ensure treatment methods do not adversely affect water quality.

Turbidity (Total Suspended Solids)

If Total Suspended Solids are greater than the discharge criteria for the relevant Discharge Point in the EPL, the sediment must settle or be removed prior to discharge. This can be achieved via the following methods:

- Natural settlement – process can be timely and is heavily dependent on local soil types.
- Flocculation – chemical treatment with a flocculent (e.g. gypsum). If the flocculant is being applied manually, an even application over the surface of the water is essential. Only environmentally safe flocculants are to be used, with the Environment and Sustainability Managers approval.

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- Filtration – using pumps to pass water through a filter medium (e.g., geofabric) to another storage area (e.g., container or sediment basin) to remove sediment.

Re-testing of water is required once treatment has been undertaken to ensure criterion for TSS is met.

pH Levels

If pH is outside the range 6.5-8.5 the water will need to be neutralised. This may be achieved via three methods which are independent on site and time constraints:

- Natural – allowing the water to sit for a period of time, allowing pH to neutralise.
- Mixing – by mixing with water collected from other parts of site, that have a higher or lower pH
- Acid/Base Addition – If the water is above 8.5, acid is used to lower the pH (i.e – HCl). If the water is below 6.5 a based is used to raise the pH (i.e – NaHCO3). To treat water with acid or base, safety requirements must be followed as outlined in the relevant Safety Data Sheet (SDS).

Prior to discharge and following treatment, ensure water is re-tested to meet the desired pH of 6.5-8.5. If not, repeat treatment and testing until the required criteria is achieved.

Oil and Grease

Examine surface of water immediately prior to discharge for evidence of oil and grease (e.g., Sheen, discolouration). No action is required if there is no visual contamination.

If there is contamination, the contaminated water will either be disposed of at a licensed disposal facility, or treated using appropriate absorbent materials, which must be spread on the surface of the water. Any used absorbent materials are to be disposed of appropriately.

Management of dewatering process

The following controls and safeguards are to be implemented when dewatering:

- Pump inlet - pumps inlets require controls to be installed to ensure they do not come into contact with sediment settled at the bottom of the basin or pond. Preventing sediment being drawn up can be achieved using floats to hold the pump inlet high in the water column. In shallow water bodies, a bucket with holes cut in or a stake may be used to ensure the hose inlet does not lower to the floor of the dewatering area.
- Pump outlet - the discharge point chosen should be safe from erosion/scour risks in the first instance. Where the discharge point selected is not already scour protected, it must be protected using temporary measures such as lining with geofabric or rock. In the context of

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basin spillways, spillways must be appropriately protected prior to use. i.e lined with geo-fabric followed by scour protection rocks.

- Pre-commencement inspection - all dewatering activities must be inspected and monitored by trained, experienced and or competent personnel.
- Commencement of pumping / discharge – monitor the initial flow path of the water away from the job. Ensure water is not flowing back onto the project or across other disturbed ground. If water is flowing over land, the flow path must be free of loose sediment/pollutants to ensure it is not impacting water quality downstream.
- Supervision of discharge – supervision of the discharge process should include:
- Visual checks of suspended solids within the water body being de-watered.
- Visual checks of the position of the pump inlet and outlet.
- General monitoring of downslope water quality to ensure the discharge process is not causing negative downstream water quality impacts.

Continuous supervision of a dewatering activity may be replaced by periodic inspections at basins where hard (fail safe) controls (i.e., basin spears) have been installed that eliminate the risk of causing environmental harm.

It is not anticipated that odours will be present in the stormwater. Stormwater will be generated only from clean surfaces and diverted offsite through appropriate controls.

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ATTACHMENT C: UNEXPECTED FINDS PROTOCOL

See following documents.

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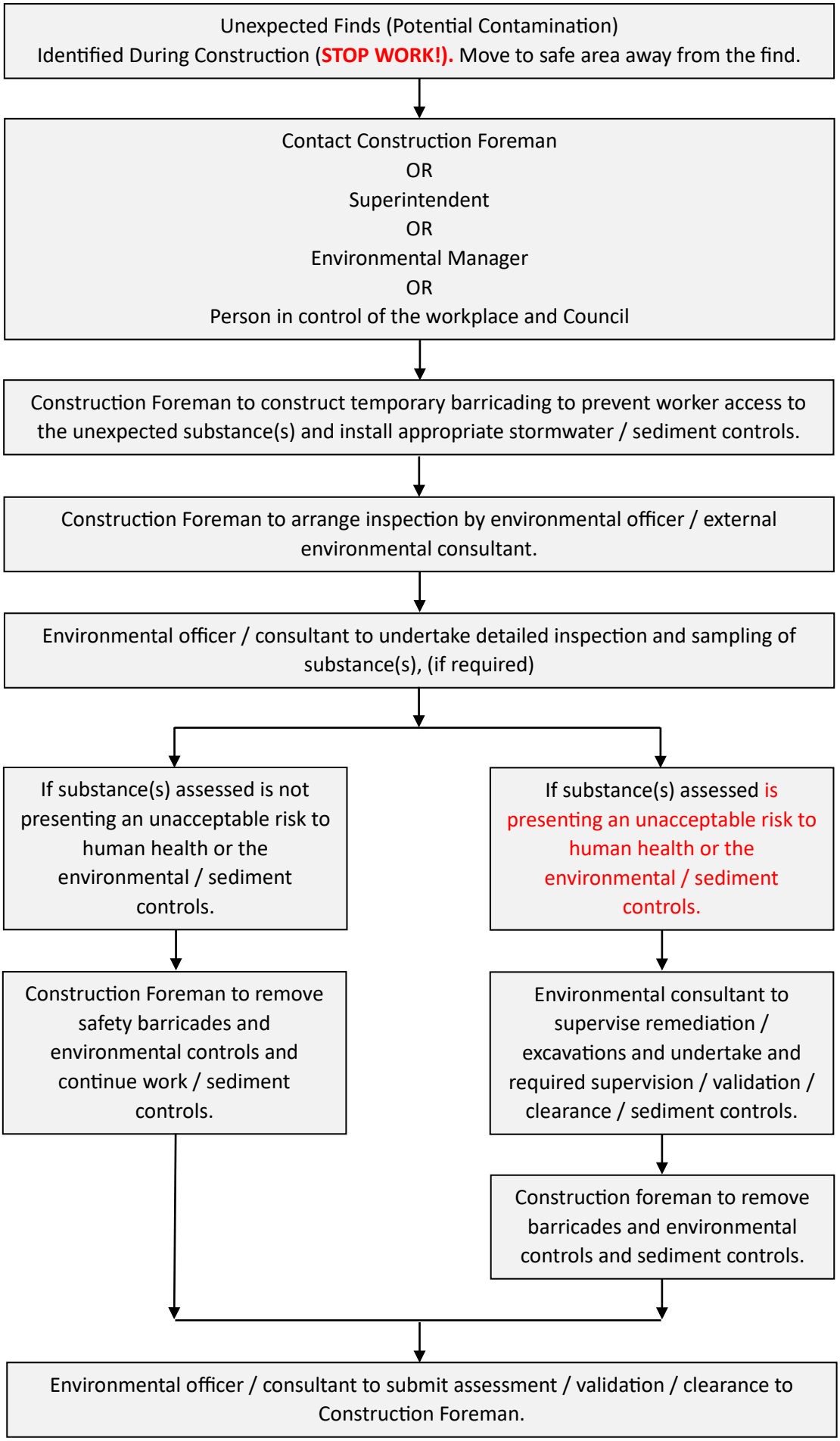
UNEXPECTED FINDS (POTENTIAL CONTAMINATION)



UNEXPECTED FINDS REGISTER

Find No.	Time & Date	Contractor & Worker Name	Location		Item Found	Comments & Observations	Who was notified	Outcome
			Easting	Northing				
Example	*10am 01/01/2024*	*Contractor, sub-contractor, workers name*	*Location of find (GPS reference if possible)*		*Description (e.g., Asbestos sheeting, buried drum of unknown liquid*	*Area features / condition at time of find, activities taking place, was work stopped, etc.*	*Site manager notified at 10am on day of find*	*Environmental consultant engaged, material disposed offsite, area cleared (documentation provided – see attached)*
001								
002								
003								
004								
005								
006								
007								
Continue with register as required during construction activities								

Important Register Notes:

1. All unexpected finds must be recorded in the register and the register must be kept on site by the environmental manager or nominated representative. The register must be kept on site until the end of construction activity and provided to CIP or their representative for future reference as required.
2. All unexpected finds must be reported to the Construction Foreman OR Superintendent OR Environmental Manager OR Person in control of the workplace to ensure correct actions can be undertaken.
3. Comments and observations should clearly document the suspect material (i.e., asbestos, hydrocarbon-stained soil, buried construction and demolition waste, buried drums with liquids), the estimated volume or extent, and odours and specific visual or olfactory observations.

ATTACHMENT D: PRELIMINARY SOIL ASSESSMENT REPORT

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Waste Classification Assessment

Secondary Innovation Precinct (SIP) and Campus Commons, Pymble Ladies' College, 20 Avon Road, Pymble NSW 2073

Prepared For:	Pymble Ladies College
Reference:	24-1683
Date:	13 March 2025

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Document History:		
Document No	**Revision No.**	**Issue Date**
24-1683	A	21.05.2024
24-1683	B	11.03.2025
24-1683	C	13.03.2025

Report Author & Technical Reviewer:	
	
Con Kariotoglou Managing Director *BSc, Cert IV WHS, AFMIML, MEIANZ, MALGA* *SafeWork NSW Approved Asbestos Assessor, License No. LAA001006*	

This report is to be read in its entirety and should not be review in individual section to provide any level of information independently. Each section of the report relates to the rest of the document and as such is to be read in conjunction, including its appendices and attachments.

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EXECUTIVE SUMMARY

ECON Environmental Pty Ltd was engaged by Pymble Ladies' College (the College) to conduct a Waste Classification Assessment on insitu soils within the proposed new Secondary Innovation Precinct (SIP) and Campus Commons area of Pymble Ladies College located at Avon Road, Pymble NSW. This was undertaken to provide a waste classification of insitu soils being removed from site as part of the site's redevelopment. Twelve (12) insitu soil samples were collected for laboratory chemical analysis, from within the proposed SIP development site.

Secondary Innovation Precinct (SIP)

With reference to the site inspection undertaken on site on Thursday 16 May 2024, samples collected and the laboratory analysis, and with reference to the *Waste Classification Guidelines 2014 – Part 1: Classifying Waste (NSW EPA, 2014)*, the following insitu soils, within the proposed new Secondary Innovation Precinct (SIP) area of Pymble Ladies College located at Avon Road, Pymble NSW, will be excavated and disposed of offsite at a licensed facility as: ***General Solid Waste (non-putrescible).***

Also, all twelve (12) soil samples collected within the proposed new Secondary Innovation Precinct (SIP) area of Pymble Ladies College located at Avon Road, Pymble NSW were reported by the laboratory to have concentrations BELOW the HIL 'A' residential land use as per the NEPM 2013 guidelines.

Campus Commons

Based on the data and evidence collected during the preliminary assessment of soils within the SIP development area, a desktop preliminary review was then undertaken on the remainder of the Campus Common area to determine if there was any potential areas of environmental concern within the remainder of the Common Campus area.

Based on historical data, there is historical evidence to suggest that importation of fill material within the subject site may had taken place in the past to level the site for school building developments within the Campus Common area. However, evidence from the preliminary soil sampling assessment within the SIP development area, shows that it is unlikely that potential contaminants of concern would also be identified within the remainder of the Common Campus.

Subsequently, in accordance with the preliminary soil sampling undertaken within the SIP development area, in our opinion, it is also likely that the soils within the remainder of the Common Campus will also potentially have concentrations BELOW the adopted site assessment criteria for HIL 'A', residential land use as per the NEPM, 2013.

However, a Preliminary or Detailed Site Investigation with soil sampling may be warranted to ensure that no contaminants of concern are identified within the remainder of the Commons Campus areas.

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TABLE OF CONTENTS

ECON Environmental Pty Ltd | ABN 25 641 106 783 | PO Box 85 Oatlands NSW 2117

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1. INTRODUCTION

1.1 Background

ECON Environmental Pty Ltd was engaged by Pymble Ladies' College (the College) to conduct a Waste Classification Assessment on insitu soils within the proposed new Secondary Innovation Precinct (SIP) and Campus Commons area of Pymble Ladies College located at Avon Road, Pymble NSW. This was undertaken to provide a waste classification of insitu soils being removed from site as part of the site's redevelopment. Twelve (12) insitu soil samples were collected for laboratory chemical analysis, from within the proposed SIP development site.

This waste classification refers to the insitu soil material within the proposed new Secondary Innovation Precinct (SIP) and Campus Commons area, as indicated in Figure 2. The total volume of soil location material to be excavated and disposed of as part of the Primary School development is approximately **2,000m^3.**

This Waste Classification report was completed in accordance with the *Waste Classification Guidelines 2014 – Part 1: Classifying Waste (NSW EPA, 2014).*

1.2 Scope of Works

The scope of works included the following:

- A site inspection of the proposed new SIP development site area of the subject site and the Campus Commons surrounding areas,
- Collection of representative insitu and stockpiled soil samples for soil classification purposes,
- Analysis of those soil samples at a laboratory accredited with NATA,
- Interpretation of all available information and compilation of a final waste classification report, and
- Reporting in accordance with the associated legislations and guidelines.

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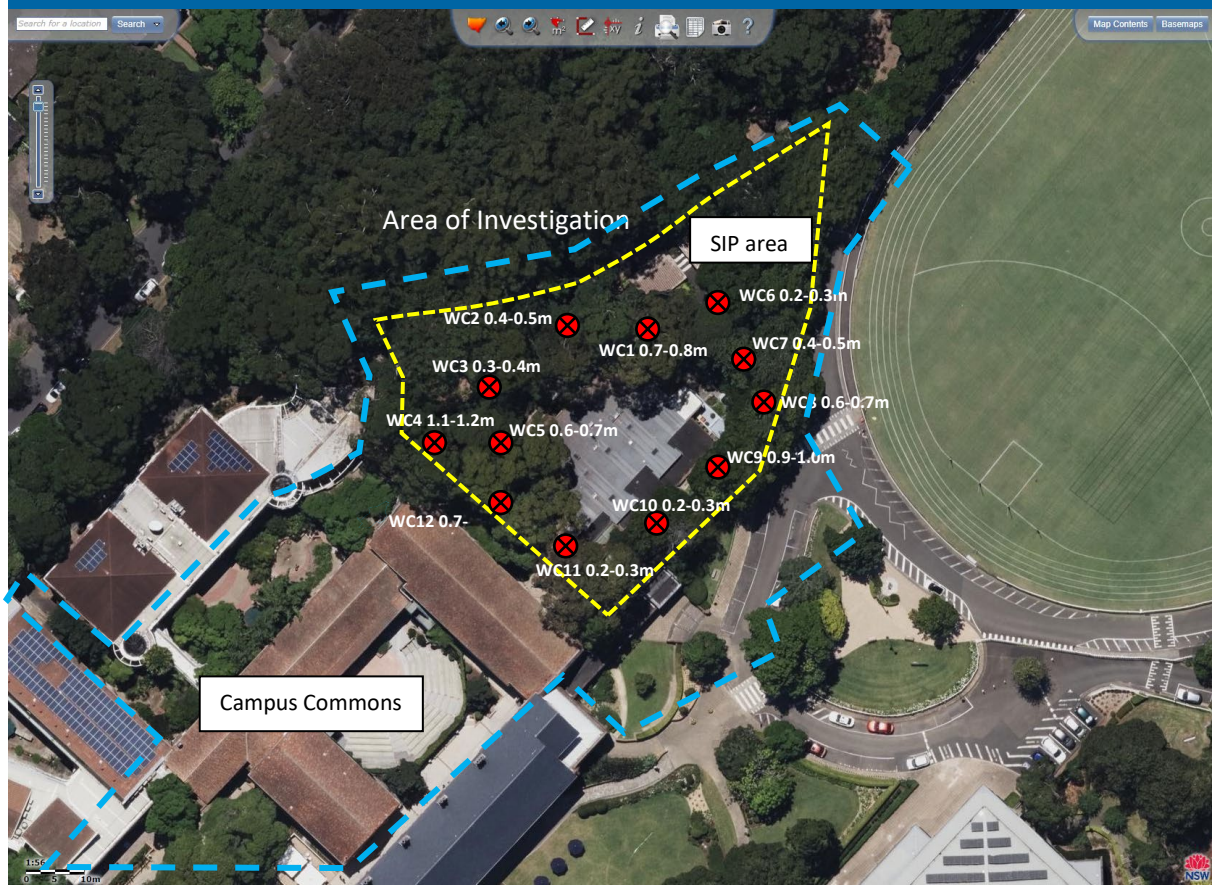
2. AREA OF INVESTIGATION

2.1 Site Investigation

The area of the inspection was within the proposed Secondary Innovation Precinct (SIP) area of Pymble Ladies College covering an area of 10,856m^2 within the subject site located at Avon Road, Pymble NSW, (Figure 1), with a potential average depth of fill material approximately 0.05m BGL. The area of the Campus Commons is shown below.

Figure 1: Preliminary Assessment of Soils within SIP Development Area



2.2 Proposed Development or Intended Land Use.

The project comprises demolition of several existing buildings and the construction of the Secondary Innovation Precinct, associated landscaping and Campus Commons at the Pymble Ladies College. The SIP is a five-storey building that will consolidate STEM based learning opportunities within the College.

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3. SITE DESCRIPTION

3.1 Site Inspections

On Thursday 16 May 2024, a site investigation was conducted by ECON Environmental's representative Con Kariotoglou. Field work was carried out in accordance with the methodology described in the NEPM (2013). At the time of inspection, the following observations were noted:

- Several school buildings were noted within the area of investigation.
- The exposed soil surfaces were covered with garden mulch or natural vegetation leaf litter.
- Several concrete pathways were noted within the area connecting the school buildings.

3.2 Topography

According to https://www.environment.nsw.gov.au/eSpade2Webapp the topography of the site includes low rolling and steep hills. Local relief 50–120 m, slopes 5–20%. Convex narrow (20–300 m) ridges and hillcrests grade into moderately inclined side slopes with narrow concave drainage lines. Moderately inclined slopes of 10–15% are the dominant landform elements.

The topography of the Proposed Administration Precinct Development area is with a slope decline towards the north of the school at approximately 10-15^0, with some levelled areas for existing building pads.

3.3 Geology and Soils

The Geological Map of Sydney (Geological Series Sheet 9130, Scale 1:100,000, 1983), published by the Department of Mineral Resources indicated the site is located in an area underlain by Wianamatta Group Ashfield Shale and Bringelly Shale formations. The Ashfield Shale is comprised of laminite and dark grey shale. Bringelly Shale consists of shale, calcareous claystone, laminite, fine to medium grained lithic-quartz sandstone (Herbert, 1983).

3.4 Surface Water Hydrology

The surface water runoff is presumed to follow in sympathy with the overall slope of the site towards the north. A network of stormwater drains was observed across the site and presumed to be plumbed into the local stormwater system of the school.

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4. SOIL SAMPLING AND ANALYSIS

4.1 Optimize Design for Obtaining Data

Soil sampling and analysis for this Assessment has been undertaken in accordance with the *NSW EPA Waste Classification Guidelines* (EPA, 2014).

The *NSW EPA Waste Classification Guidelines* (EPA, 2014) provides tight maximum average and absolute maximum concentration values for a suite of chemical and other attributes.

4.2 Analytes

The *NSW EPA Waste Classification Guidelines* (EPA, 2014) outlines an initial screening test for the classification of waste. Chemical concentrations of concern listed in Column 1 of Table 2, were measured against the Maximum values for specific contaminant concentration to comply with the concentrations provided in Columns 2 and 3. That table is duplicated here as Tables 4 and 5. Each sample was also analysed for Asbestos (presence or absence). The laboratory used for the analysis of all primary samples was ALS Environmental located at 277-289 Woodpark Road, Smithfield NSW Australia. The laboratory is NATA accredited for the selected analyses.

4.3 Soil Sample Methodology

Twelve (12) soil samples were collected on Thursday 16 May 2024 from within the insitu soils at a depth (between 0.0-1.2m) to characterise the insitu soil material within the proposed new SIP development area, for the purposes of disposing off site to an EPA licenced facility.

During the collection of soil samples, any features such as seepage, discoloration, staining, odours, or other physical indicators of contamination were noted.

All site work was undertaken by Con Kariotoglou, Environmental Scientist of ECON Environmental. Soil samples were transferred directly from the boreholes into laboratory supplied 150 mL sample jars sealed with Teflon lids. Asbestos samples were collected in asbestos sample bags and zip locked. The samples were stored in a chilled esky and transferred to ALS Environmental Division under stringent chain of custody (COC) procedures.

4.4 Waste Classification Criteria

Contaminant	Maximum values of *specific contaminant concentration* (SCC) for classification without TCLP		CAS Registry Number
	General solid waste[1]	Restricted solid waste	
	CT1 (mg/kg)	CT2 (mg/kg)	
Arsenic	100	400	
Benzene	10	40	71-43-2
Benzo(a)pyrene[2]	0.8	3.2	50-32-8
Beryllium	20	80	
Cadmium	20	80	
Carbon tetrachloride	10	40	56-23-5
Chlorobenzene	2,000	8,000	108-90-7
Chloroform	120	480	67-66-3
Chlorpyrifos	4	16	2921-88-2
Chromium (VI)[3]	100	400	
m-Cresol	4,000	16,000	108-39-4
o-Cresol	4,000	16,000	95-48-7
p-Cresol	4,000	16,000	106-44-5
Cresol (total)	4,000	16,000	1319-77-3
Cyanide (amenable)[4]	70	280	
Cyanide (total)	320	1,280	
2,4-D	200	800	94-75-7
1,2-Dichlorobenzene	86	344	95-50-1
1,4-Dichlorobenzene	150	600	106-46-7
1,2-Dichloroethane	10	40	107-06-2
1,1-Dichloroethylene	14	56	75-35-4
Dichloromethane	172	688	75-09-2
2,4-Dinitrotoluene	2.6	10.4	121-14-2
Endosulfan[5]	60	240	See below[5]
Ethylbenzene	600	2,400	100-41-4
Fluoride	3,000	12,000	
Fluroxypyr	40	160	69377-81-7
Lead	100	400	

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Contaminant	Maximum values of *specific contaminant concentration* (SCC) for classification without TCLP		CAS Registry Number
	General solid waste[1]	Restricted solid waste	
	CT1 (mg/kg)	CT2 (mg/kg)	
Mercury	4	16	
Methyl ethyl ketone	4,000	16,000	78-93-3
Moderately harmful pesticides[6] (total)	250	1,000	See below[6]
Molybdenum	100	400	
Nickel	40	160	
Nitrobenzene	40	160	98-95-3
C6–C9 petroleum hydrocarbons[7]	650	2,600	
C10–C36 petroleum hydrocarbons[7]	10,000	40,000	
Phenol (non-halogenated)	288	1,152	108-95-2
Picloram	60	240	1918-02-1
Plasticiser compounds[8]	20	80	See below[8]
Polychlorinated biphenyls[9]	<50	<50	1336-36-3
Polycyclic aromatic hydrocarbons (total)[10]	200	800	
Scheduled chemicals[11]	<50	<50	
Selenium	20	80	
Silver	100	400	
Styrene (vinyl benzene)	60	240	100-42-5
Tebuconazole	128	512	107534-96-3
1,2,3,4-Tetrachlorobenzene	10	40	634-66-2
1,1,1,2-Tetrachloroethane	200	800	630-20-6
1,1,2,2-Tetrachloroethane	26	104	79-34-5
Tetrachloroethylene	14	56	127-18-4
Toluene	288	1,152	108-88-3
1,1,1-Trichloroethane	600	2,400	71-55-6
1,1,2-Trichloroethane	24	96	79-00-5
Trichloroethylene	10	40	79-01-6
2,4,5-Trichlorophenol	8,000	32,000	95-95-4
2,4,6-Trichlorophenol	40	160	88-06-2
Triclopyr	40	160	55335-06-3

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Contaminant	Maximum values of *specific contaminant concentration* (SCC) for classification without TCLP		CAS Registry Number
	General solid waste[1]	Restricted solid waste	
	CT1 (mg/kg)	CT2 (mg/kg)	
Vinyl chloride	4	16	75-01-4
Xylenes (total)	1,000	4,000	1330-20-7

Notes

1. Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible).
2. There may be a need for the laboratory to concentrate the sample to achieve the TCLP limit value for benzo(a)pyrene with confidence.
3. These limits apply to chromium in the +6 oxidation state only.
4. Analysis for cyanide (amenable) is the established method for assessing potentially leachable cyanide. The EPA may consider other methods if it can be demonstrated that these methods yield the same information.
5. Endosulfan (CAS Registry Number 115-29-7) means the total of Endosulfan I (CAS Registry Number 959-98-8), Endosulfan II (CAS Registry Number 891-86-1) and Endosulfan sulfate (CAS Registry Number 1031-07-8).
6. The following moderately harmful pesticides are to be included in the total values specified:

5. QUALITY ASSURANCE / QUALITY CONTROL

5.1 Site Procedures

The following field quality assurance and quality control measures were implemented:

- All sample jars and sample bags were clearly labelled prior to site visit
- All soil samples were collected by hand (after shallow excavation using a clean mattock)
- Disposable gloves were worn throughout the process and changed between the collection of each soil sample
- All sampled jars and bags were immediately placed in an ice-block chilled esky
- All samples were clearly labelled and sealed for couriering
- The ALS Environmental chain-of-custody form was completed and emailed to the lab as well as a hard copy placed with the esky with the samples
- All samples were kept in the office of ECON Environmental until collected by courier, and
- Ice blocks were interchanged prior to couriering.

5.2 Laboratory

The following is an extract from the quote for service provided by ALS Environmental Division.

"ALS has a comprehensive QA/QC program. Our QA/QC procedures are designed to provide reliable and defensible analytical results. Our analytical services are based on internal QCS3 schedule, which includes Laboratory Control Samples (LCS), Method Blanks (MB), Matrix Spikes (MS), Laboratory Duplicates (Dups) and Surrogates (for target organics) where applicable, at frequencies at or above that detailed in the 1999 NEPM guidelines.

The basis of the QCS3 Schedule is the 'analytical lot' (process analytical batch) of samples. Generally, the laboratory processes samples of similar matrices in groups called 'Lots'. 'Lots' are made up of 20 samples that may consist of several discrete batches and may be independent of project and / or client. The selection of samples for QC purposes will be biased towards the larger batches within the process lot…".

The following summarizes the frequency that QC samples are processed:

1. 5% Method Blanks (MB) –1 analysed within each process lot of 20 samples
2. 10% Laboratory Duplicates (Dups) –2 analysed within each process lot of 20 samples
3. 5% Laboratory Control Samples (LCS) –1 analysed within each process lot of 20 samples
4. 5% Matrix Spikes (MS) – 1 analysed within each process lot of 20 samples (except for dioxins)
5. Surrogate Spikes on all 'target' organics analyses.

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5.3 QA/QC Results

5.3.1 Site

- All soil samples arrived at ALS Environmental within specified holding times
- All soil samples arrived at ALS Environmental within specified temperature requirements
- No potential OHS incidents were recorded on site
- No quality assurance incidents (such as cross contamination or similar) were recorded
- The RPDs for all analytes (for the sampling set Saturday 06 April 2024) were within their respective control limits. Therefore, the data set is considered to be adequately precise.

5.3.2 Laboratory

ALS Environmental Division provided a Quality Control Report and Interpretive Quality Control Report (Appendix D). Those Quality Control Reports contain the following information:

- A Laboratory Duplicate (DUP) Report - referring to a randomly selected intra-laboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. For all matrices, no Duplicate outliers occurred.
- A Method Blank (MB) Report - referring 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. For all matrices, no Method Blank outliers occurred.
- Laboratory Control Spike (LCS) Report - referring 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. For all matrices, no Laboratory Control outliers occurred.
- A Matrix Spike (MS) Report – referring to an intra-laboratory 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. For all matrices, no Matrix Spike outliers occurred.
- An Analysis Holding Time Compliance Report - No Analysis Holding Time outliers exist.
- A Frequency of Quality Control Samples Report - No Quality Control Frequency Outliers exist.

5.4 QA/QC Conclusions

The field sampling and handling procedures across the site produced QA/QC results which indicate that the soil data collected is of acceptable quality and suitable for use in site characterisation.

The NATA certified laboratory reports indicate that the laboratory was generally achieving levels of performance within its recommended control limits during the period when the samples from this program were analysed.

On this basis of the results and the laboratory QA/QC program, the soil data is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the site.

6. RESULTS

6.1 Soil Laboratory Results Tables

A thorough review of the analytical results provided by ALS (Appendix B) was undertaken. The concentration values of all analytes were compared with their respective compliance values. The following Tables A-D summarise the results.

The soil concentrations of all the tested analytes, as shown in Tables A, B, C & D are below CT1 criteria.

TABLE A
HEAVY METALS TEST RESULTS

Analyte / Sample Location	Date Sampled	Depth (m)	HEAVY METALS (mg/kg) ARSENIC	CADMIUM	CHROMIUM	COPPER	NICKEL	LEAD	ZINC	MERCURY
WC1	16.05.2024	0.7-0.8	5	<1	13	11	3	28	12	<0.1
WC2	16.05.2024	0.4-0.5	11	<1	24	31	25	30	59	<0.1
WC3	16.05.2024	0.3-0.4	6	<1	19	31	23	24	63	0.2
WC4	16.05.2024	1.1-1.2	<5	<1	38	17	30	8	27	<0.1
WC5	16.05.2024	0.6-0.7	5	<1	14	24	8	30	86	<0.1
WC6	16.05.2024	0.2-0.3	8	<1	19	18	6	33	31	<0.1
WC7	16.05.2024	0.4-0.5	8	<1	17	25	5	44	47	<0.1
WC8	16.05.2024	0.6-0.7	5	<1	11	23	4	46	52	0.1
WC9	16.05.2024	0.9-1.0	<5	<1	8	15	4	25	51	<0.1
WC10	16.05.2024	0.2-0.3	<5	<1	11	50	5	31	93	<0.1
WC11	16.05.2024	0.2-0.3	9	<1	23	12	<2	24	6	<1
WC12	16.05.2024	0.7-0.8	<5	<1	8	24	5	26	36	0.4
Practical Quantitation Limits (PQL)			5	1	2	5	2	5	5	0.1
Waste Criteria - Total Concentration (w/o TCLP)										
CT1 - General Solid Waste			100	20	100	-	40	100	-	4
CT2 - Restricted Solid Waste			400	80	400	-	160	400	-	16
Waste Criteria - Total Concentration (with TCLP)										
SCC1 - General Solid Waste			500	100	1900	-	1050	1500	-	50
SCC2 - Restricted Solid Waste			2000	400	7600	-	4200	6000	-	200

Notes
1 CT1, CT2 : Total concentrations used for defining General Solid Waste and Restricted Solid Waste respectively (without TCLP)
2 SCC1, SCC2 : Total Concentration used for defining General Solid Waste and Restricted Solid Waste respectively (in conjunction with TCLP)
3 Concentrations in **bold** exceed the CT1 criteria
4 Concentrations in **bold and underlined** exceed the CT2 criteria

As shown in Table A, all sample heavy metals results were BELOW their respective CT1 criteria.

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TABLE B
TOTAL PETROLEUM HYDROCARBONS (TPH) AND BTEX TEST RESULTS

Analyte / Sample Location	Date Sampled	Depth (m)	TPH (mg/kg) C6-C9	TPH (mg/kg) C10-C14	TPH (mg/kg) C15-C28	TPH (mg/kg) C29-C36	TPH (mg/kg) C10-C36[a]	BTEX (mg/kg) BENZENE	BTEX (mg/kg) TOLUENE	BTEX (mg/kg) ETHYL BENZENE	BTEX (mg/kg) TOTAL XYLENES
WC1	16.05.2024	0.7-0.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC2	16.05.2024	0.4-0.5	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC3	16.05.2024	0.3-0.4	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC4	16.05.2024	1.1-1.2	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC5	16.05.2024	0.6-0.7	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC6	16.05.2024	0.2-0.3	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC7	16.05.2024	0.4-0.5	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC8	16.05.2024	0.6-0.7	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC9	16.05.2024	0.9-1.0	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC10	16.05.2024	0.2-0.3	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC11	16.05.2024	0.2-0.3	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
WC12	16.05.2024	0.7-0.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5
Practical Quantitation Limits (PQL)			10	50	100	100	50	0.2	0.5	0.5	0.5
Waste Criteria - Total Concentration (w/o TCLP)											
CT1 - General Solid Waste			NA	-	-	-	NA	10	288	600	1000
CT2 - Restricted Solid Waste			NA	-	-	-	NA	40	1152	2400	4000
Waste Criteria - Total Concentration (with TCLP)											
SCC1 - General Solid Waste			650	-	-	-	10000	18	518	1080	1800
SCC2 - Restricted Solid Waste			2600	-	-	-	40000	72	2073	4320	7200

Notes
1 CT1, CT2 : Total concentrations used for defining General Solid Waste and Restricted Solid Waste respectively (without TCLP).
2 SCC1, SCC2 : Total Concentration used for defining General Solid Waste and Restricted Solid Waste respectively (in conjunction with TCLP)
3 Concentrations in **bold** exceed the SCC1 criteria
4 Concentrations in **bold and underlined** exceed the SCC2 criteria
NA: Not Applicable

As shown in Table B, the concentrations of TPH and BTEX were either BELOW their respective PQL or below their respective CT1 and/or SCC1 criteria.

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TABLE C
BENZO(a)PYRENE, POLYCYCLIC AROMATIC HYDROCARBONS (PAH) TEST RESULTS

Analyte / Sample Location	Date Sampled	Depth (m)	PAH (mg/kg) BENZO(a)PYRENE (mg/kg)	PAH (mg/kg) TOTAL PAH (mg/kg)
WC1	16.05.2024	0.7-0.8	<0.5	<0.5
WC2	16.05.2024	0.4-0.5	<0.5	<0.5
WC3	16.05.2024	0.3-0.4	<0.5	<0.5
WC4	16.05.2024	1.1-1.2	<0.5	<0.5
WC5	16.05.2024	0.6-0.7	<0.5	<0.5
WC6	16.05.2024	0.2-0.3	<0.5	<0.5
WC7	16.05.2024	0.4-0.5	<0.5	<0.5
WC8	16.05.2024	0.6-0.7	<0.5	<0.5
WC9	16.05.2024	0.9-1.0	<0.5	<0.5
WC10	16.05.2024	0.2-0.3	<0.5	<0.5
WC11	16.05.2024	0.2-0.3	<0.5	<0.5
WC12	16.05.2024	0.7-0.8	<0.5	<0.5
Practical Quantitation Limits (PQL)			0.5	0.5
Waste Criteria - Total Concentration (w/o TCLP)				
CT1 - General Solid Waste			0.8	200
CT2 - Restricted Solid Waste			3.2	800
Waste Criteria - Total Concentration (with TCLP)				
SCC1 - General Solid Waste			10	200
SCC2 - Restricted Solid Waste			23	800

Notes
1 CT1, CT2 : Total concentrations used for defining General Solid Waste and Restricted Solid Waste respectively (without TCLP)
2 SCC1, SCC2 : Total Concentration used for defining General Solid Waste and Restricted Solid Waste respectively (in conjunction with TCLP)
3 Concentrations in **bold** exceed the CT1 criteria
4 Concentrations in **bold and underlined** exceed the CT2 criteria
NA: Not Applicable

As shown in Table C, the concentrations of benzo(a)pyrene and Total PAH were BELOW the CT1 and/or SCC1 criteria.

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TABLE D
ASBESTOS TEST RESULTS

Sample Location	Date Sampled	Depth (m)	Field Observations	Laboratory Results *Asbestos Absence / Presence*
WC1	16.05.2024	0.7-0.8	No visible fibre-cement fragments observed	No Asbestos Detected
WC2	16.05.2024	0.4-0.5	No visible fibre-cement fragments observed	No Asbestos Detected
WC3	16.05.2024	0.3-0.4	No visible fibre-cement fragments observed	No Asbestos Detected
WC4	16.05.2024	1.1-1.2	No visible fibre-cement fragments observed	No Asbestos Detected
WC5	16.05.2024	0.6-0.7	No visible fibre-cement fragments observed	No Asbestos Detected
WC6	16.05.2024	0.2-0.3	No visible fibre-cement fragments observed	No Asbestos Detected
WC7	16.05.2024	0.4-0.5	No visible fibre-cement fragments observed	No Asbestos Detected
WC8	16.05.2024	0.6-0.7	No visible fibre-cement fragments observed	No Asbestos Detected
WC9	16.05.2024	0.9-1.0	No visible fibre-cement fragments observed	No Asbestos Detected
WC10	16.05.2024	0.2-0.3	No visible fibre-cement fragments observed	No Asbestos Detected
WC11	16.05.2024	0.2-0.3	No visible fibre-cement fragments observed	No Asbestos Detected
WC12	16.05.2024	0.7-0.8	No visible fibre-cement fragments observed	No Asbestos Detected

As shown in Table D, NO Asbestos was detected or observed in all the samples.

6.2 Soil Laboratory Results Tables – HIL 'A' Land Use

All twelve (12) soil samples were reported by the laboratory to have concentrations **BELOW** the HIL 'A' residential land use as per the NEPM 2013 guidelines.

Result tables are shown in Appendix C.

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7. CONCLUSION:

Secondary Innovation Precinct (SIP)

With reference to the site inspection undertaken on site on Thursday 16 May 2024, samples collected and the laboratory analysis, and with reference to the *Waste Classification Guidelines 2014 – Part 1: Classifying Waste (NSW EPA, 2014)*, the following insitu soils, within the proposed new Secondary Innovation Precinct (SIP) area of Pymble Ladies College located at Avon Road, Pymble NSW, will be excavated and disposed of offsite at a licensed facility as: *General Solid Waste (non-putrescible).*

If the material is transported within NSW or interstate to an appropriate licenced facility, it must be tracked and monitored using an NSW EPA approved tracking waste system. As a result of these classifications the material can be disposed of as per Schedule 1 Part 3 of the *Protection of the Environment Operations Act 1997*.

Also, all twelve (12) soil samples collected within the proposed new Secondary Innovation Precinct (SIP) area of Pymble Ladies College located at Avon Road, Pymble NSW were reported by the laboratory to have concentrations BELOW the HIL 'A' residential land use as per the NEPM 2013 guidelines.

Campus Commons

Based on the data and evidence collected during the preliminary assessment of soils within the SIP development area, a desktop preliminary review was then undertaken on the remainder of the Campus Common area to determine if there was any potential areas of environmental concern within the remainder of the Common Campus area.

Based on historical data, there is historical evidence to suggest that importation of fill material within the subject site may had taken place in the past to level the site for school building developments within the Campus Common area. However, evidence from the preliminary soil sampling assessment within the SIP development area, shows that it is unlikely that potential contaminants of concern would also be identified within the remainder of the Common Campus.

Subsequently, in accordance with the preliminary soil sampling undertaken within the SIP development area, in our opinion, it is also likely that the soils within the remainder of the Common Campus will also potentially have concentrations BELOW the adopted site assessment criteria for HIL 'A', residential land use as per the NEPM, 2013.

However, a Preliminary or Detailed Site Investigation with soil sampling may be warranted to ensure that no contaminants of concern are identified within the remainder of the Commons Campus areas.

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8. LIMITATION STATEMENT

ECON Environmental Pty Ltd has undertaken the following report in accordance with the scope of works set out between ECON Environmental Pty Ltd and the client. ECON Environmental Pty Ltd derived the data in this report primarily from the site and soil assessment conducted on the date of site inspection. The impacts of future events may require future investigation of the site and subsequent data analysis, together with a re-evaluation of the conclusions and recommendations of this report.

In preparing this report, ECON Environmental Pty Ltd has relied upon, and assumed accurate, certain site information provided by the client and other persons. Except as otherwise stated in the report, we have not attempted to verify the accuracy or completeness of any such information. ECON Environmental Pty Ltd accepts no liability or responsibility whatsoever for or in respect to any use or reliance upon this report by any third party.

The information contained within this report have been prepared exclusively for the client. ECON Environmental Pty Ltd have prepared the report to address the risk associated with scale of the works. The report has been prepared with a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental industry in Australia. No other warranty, expressed or implied, is made or intended. This report is to be read in its entirety including attachments and appendices and should not read in individual sections.

A third party should not rely upon the information prior to making an assessment that the scope of work conducted meets their specific needs. ECON Environmental Pty Ltd cannot be held liable for third party reliance on this document.

ECON Environmental Pty Ltd'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. ECON Environmental Pty Ltd has limited its investigation to the scope agreed upon with its client.

APPENDIX A: SITE PHOTOGRAPHS

ECON Environmental Pty Ltd | ABN 25 641 106 783 | PO Box 85 Oatlands NSW 2117
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Photo 1: Showing borehole WC1 sampling location, 16.05.2024.

Photo 2: Showing borehole WC1 sampling location, looking northwest, 16.05.2024.

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Photo 3: Showing borehole WC2 sampling location, 16.05.2024.

Photo 4: Showing borehole WC2 sampling location, looking north, 16.05.2024.

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Photo 5: Showing borehole WC3 sampling location, 16.05.2024.

Photo 6: Showing borehole WC3 sampling location, looking south, 16.05.2024.

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Photo 7: Showing borehole WC4 sampling location, 16.05.2024.

Photo 8: Showing borehole WC4 sampling location, looking north, 16.05.2024.

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Photo 9: Showing borehole WC5 sampling location, 16.05.2024.

Photo 10: Showing borehole WC5 sampling location, looking south, 16.05.2024.

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Photo 11: Showing borehole WC6 sampling location, looking south, 16.05.2024.

Photo 12: Showing borehole WC6 sampling location, looking north, 16.05.2024.

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Photo 13: Showing borehole WC7 sampling location, looking north, 16.05.2024.

Photo 14: Showing borehole WC7 sampling location, looking north, 16.05.2024.

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Photo 15: Showing borehole WC8 sampling location, 16.05.2024.

Photo 16: Showing borehole WC8 sampling location, looking east, 16.05.2024.

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Photo 17: Showing borehole WC9 sampling location, 16.05.2024.

Photo 18: Showing borehole WC9 sampling location, looking north, 16.05.2024.

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Photo 19: Showing borehole WC10 sampling location, 16.05.2024.

Photo 20: Showing borehole WC10 sampling location, looking north, 16.05.2024.

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Photo 21: Showing borehole WC11 sampling location, looking north, 16.05.2024.

Photo 22: Showing borehole WC11 sampling location, looking south, 16.05.2024.

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Photo 23: Showing borehole WC12 sampling location, 16.05.2024.

Photo 23: Showing borehole WC12 sampling location, looking south, 16.05.2024.

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APPENDIX B: LABORATORY CERTIFICATES

ECON Environmental Pty Ltd | ABN 25 641 106 783 | PO Box 85 Oatlands NSW 2117
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CERTIFICATE OF ANALYSIS

Work Order	: **ES2415907**	Page	: 1 of 13
Client	: **ECON Environmental Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Con Kariotoglou	Contact	: Customer Services ES
Address	: 1 St Aidans Avenue Oatlands 2117	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: PYMBLE	Date Samples Received	: 16-May-2024 14:15
Order number	: 24-1683	Date Analysis Commenced	: 17-May-2024
C-O-C number	: ----	Issue Date	: 21-May-2024 16:28
Sampler	: Con Kariotoglou		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 12		
No. of samples analysed	: 12		

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*
Alana Smylie	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, 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.

- 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the 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.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- 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: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- 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: 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
- 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WC1 0.7-0.8	WC2 0.4-0.5	WC3 0.3-0.4	WC4 1.1-1.2	WC5 0.6-0.7
			Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00
Compound	CAS Number	LOR	Unit	ES2415907-001	ES2415907-002	ES2415907-003	ES2415907-004	ES2415907-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**17.6**	**17.3**	**15.2**	**12.6**	**16.1**
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	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**26.5**	**35.2**	**34.0**	**33.7**	**23.8**
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**
Synthetic Mineral Fibre	----	-	--	**No**	**No**	**No**	**No**	**No**
Organic Fibre	----	-	--	**No**	**No**	**No**	**No**	**No**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**5**	**11**	**6**	<5	**5**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**13**	**24**	**19**	**38**	**14**
Copper	7440-50-8	5	mg/kg	**11**	**31**	**31**	**17**	**24**
Lead	7439-92-1	5	mg/kg	**28**	**30**	**24**	**8**	**30**
Nickel	7440-02-0	2	mg/kg	**3**	**25**	**23**	**30**	**8**
Zinc	7440-66-6	5	mg/kg	**12**	**59**	**63**	**27**	**86**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	**0.1**
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	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WC1 0.7-0.8	WC2 0.4-0.5	WC3 0.3-0.4	WC4 1.1-1.2	WC5 0.6-0.7
				Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2415907-001	ES2415907-002	ES2415907-003	ES2415907-004	ES2415907-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<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	<0.5	<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	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**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		<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

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	WC1 0.7-0.8	WC2 0.4-0.5	WC3 0.3-0.4	WC4 1.1-1.2	WC5 0.6-0.7
				Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00
					ES2415907-001	ES2415907-002	ES2415907-003	ES2415907-004	ES2415907-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**87.2**	**86.6**	**89.5**	**98.4**	**82.8**
2-Chlorophenol-D4	93951-73-6	0.5	%		**89.8**	**93.6**	**95.8**	**99.8**	**88.1**
2.4.6-Tribromophenol	118-79-6	0.5	%		**78.3**	**84.7**	**86.6**	**83.7**	**77.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**85.9**	**93.7**	**93.4**	**91.7**	**86.7**
Anthracene-d10	1719-06-8	0.5	%		**86.8**	**95.8**	**94.5**	**93.2**	**88.7**
4-Terphenyl-d14	1718-51-0	0.5	%		**85.9**	**95.6**	**93.7**	**92.2**	**87.5**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**80.0**	**87.8**	**88.4**	**84.5**	**94.3**
Toluene-D8	2037-26-5	0.2	%		**74.6**	**81.8**	**77.8**	**78.0**	**84.7**
4-Bromofluorobenzene	460-00-4	0.2	%		**78.2**	**83.0**	**82.9**	**81.7**	**85.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WC6 0.2-0.3	WC7 0.4-0.5	WC8 0.6-0.7	WC9 0.9-1.0	WC10 0.2-0.3
			Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00
Compound	CAS Number	LOR	Unit	ES2415907-006	ES2415907-007	ES2415907-008	ES2415907-009	ES2415907-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**17.7**	**27.6**	**15.3**	**20.3**	**18.5**
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	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**23.0**	**23.4**	**22.2**	**41.1**	**24.4**
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**
Synthetic Mineral Fibre	----	-	--	**No**	**No**	**No**	**No**	**No**
Organic Fibre	----	-	--	**No**	**No**	**No**	**No**	**No**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**8**	**8**	**5**	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**19**	**17**	**11**	**8**	**11**
Copper	7440-50-8	5	mg/kg	**18**	**25**	**23**	**15**	**50**
Lead	7439-92-1	5	mg/kg	**33**	**44**	**46**	**25**	**31**
Nickel	7440-02-0	2	mg/kg	**6**	**5**	**4**	**4**	**5**
Zinc	7440-66-6	5	mg/kg	**31**	**47**	**52**	**51**	**93**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	**0.1**	<0.1	<0.1
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	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WC6 0.2-0.3	WC7 0.4-0.5	WC8 0.6-0.7	WC9 0.9-1.0	WC10 0.2-0.3
				Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2415907-006	ES2415907-007	ES2415907-008	ES2415907-009	ES2415907-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<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	<0.5	<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	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	**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		<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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WC6 0.2-0.3	WC7 0.4-0.5	WC8 0.6-0.7	WC9 0.9-1.0	WC10 0.2-0.3
				Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00	16-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2415907-006	ES2415907-007	ES2415907-008	ES2415907-009	ES2415907-010
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**85.7**	**86.4**	**89.8**	**89.4**	**89.3**
2-Chlorophenol-D4	93951-73-6	0.5	%		**84.5**	**94.8**	**96.6**	**94.9**	**101**
2.4.6-Tribromophenol	118-79-6	0.5	%		**80.6**	**83.9**	**85.6**	**83.6**	**91.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**89.3**	**91.0**	**92.1**	**89.1**	**94.2**
Anthracene-d10	1719-06-8	0.5	%		**90.4**	**92.6**	**92.6**	**90.6**	**93.1**
4-Terphenyl-d14	1718-51-0	0.5	%		**89.7**	**91.1**	**91.9**	**88.7**	**94.2**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**88.0**	**77.2**	**85.2**	**78.8**	**80.9**
Toluene-D8	2037-26-5	0.2	%		**78.9**	**86.8**	**76.2**	**74.3**	**78.2**
4-Bromofluorobenzene	460-00-4	0.2	%		**81.1**	**76.8**	**82.4**	**78.2**	**79.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WC11 0.2-0.3	WC12 0.7-0.8	----	----	----
			Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2415907-011	ES2415907-012	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**19.9**	**17.3**	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	----	----	----
Asbestos (Trace)	1332-21-4	-	-	**No**	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	**-**	----	----	----
Sample weight (dry)	----	0.01	g	**34.6**	**26.6**	----	----	----
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	----	----	----
Synthetic Mineral Fibre	----	-	--	**No**	**No**	----	----	----
Organic Fibre	----	-	--	**No**	**No**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**9**	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**23**	**8**	----	----	----
Copper	7440-50-8	5	mg/kg	**12**	**24**	----	----	----
Lead	7439-92-1	5	mg/kg	**24**	**26**	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	**5**	----	----	----
Zinc	7440-66-6	5	mg/kg	**6**	**36**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	**0.4**	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WC11 0.2-0.3	WC12 0.7-0.8	----	----	----
				Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2415907-011	ES2415907-012	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WC11 0.2-0.3	WC12 0.7-0.8	----	----	----
			Sampling date / time	16-May-2024 00:00	16-May-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2415907-011	ES2415907-012	--------	--------	--------
				Result	Result	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**95.6**	**93.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**101**	**96.4**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**89.5**	**89.3**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**92.4**	**89.5**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**96.6**	**92.0**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**94.6**	**90.3**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**78.9**	**80.2**	----	----	----
Toluene-D8	2037-26-5	0.2	%	**74.4**	**75.0**	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**80.1**	**81.7**	----	----	----

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	WC10.7-0.8 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC20.4-0.5 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC30.3-0.4 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC41.1-1.2 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC50.6-0.7 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC60.2-0.3 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC70.4-0.5 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC80.6-0.7 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC90.9-1.0 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC100.2-0.3 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC110.2-0.3 - 16-May-2024 00:00	Soil sample.
EA200: Description	WC120.7-0.8 - 16-May-2024 00:00	Soil sample.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
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

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

QUALITY CONTROL REPORT

Work Order	: **ES2415907**	Page	: 1 of 9
Client	: **ECON Environmental Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Con Kariotoglou	Contact	: Customer Services ES
Address	: 1 St Aidans Avenue Oatlands 2117	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: PYMBLE	Date Samples Received	: 16-May-2024
Order number	: 24-1683	Date Analysis Commenced	: 17-May-2024
C-O-C number	: ----	Issue Date	: 21-May-2024
Sampler	: Con Kariotoglou		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 12		
No. of samples analysed	: 12		

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*
Alana Smylie	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, 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.

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: 5796710)									
ES2413694-021	Anonymous	EG005T: Chromium	7440-47-3	2	mg/kg	31	31	0.0	0% - 50%
ES2415898-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	16	23.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	25	25	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	129	144	10.8	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	1160	1290	11.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	563	552	1.9	0% - 20%
ES2413694-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	13	14	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	26	28	7.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	50	52	4.4	0% - 50%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5796713)									
ES2415907-010	WC10 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	11	7	37.5	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	3	41.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	50	47	6.1	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	31	21	39.7	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 (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5796713) - continued									
ES2415907-010	WC10 0.2-0.3	EG005T: Zinc	7440-66-6	5	mg/kg	93	92	0.0	0% - 50%
ME2400811-007	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	37	26	35.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	15	12	22.8	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	40	42	5.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	38	30	21.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	92	73	22.1	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5796721)									
ES2415717-002	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	11.0	10.7	3.5	0% - 50%
ES2415907-002	WC2 0.4-0.5	EA055: Moisture Content	----	0.1 (1.0)*	%	17.3	17.9	3.4	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5796722)									
ES2415907-011	WC11 0.2-0.3	EA055: Moisture Content	----	0.1 (1.0)*	%	19.9	20.7	4.1	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5796709)									
ES2413694-021	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2415907-003	WC3 0.3-0.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5795114)									
ES2415907-001	WC1 0.7-0.8	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

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: 5795114) - continued									
ES2415907-011	WC11 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	<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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5795115)									
ES2415907-001	WC1 0.7-0.8	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
ES2415907-011	WC11 0.2-0.3	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: 5796799)									
ES2415898-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2415907-007	WC7 0.4-0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5795115)									
ES2415907-001	WC1 0.7-0.8	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
ES2415907-011	WC11 0.2-0.3	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

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: 5796799)									
ES2415898-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2415907-007	WC7 0.4-0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5796799)									
ES2415898-001	Anonymous	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
ES2415907-007	WC7 0.4-0.5	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

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: 5796710)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	96.4	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	87.3	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	109	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	91.2	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	94.0	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	93.1	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	87.4	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5796713)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	106	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	119	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	132	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	111	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	114	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	112	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	103	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5796709)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	89.6	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5795114)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.3	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	98.2	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	94.1	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	95.6	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	95.9	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	93.2	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	101	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	93.7	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	98.0	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	96.6	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	102	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	99.6	74.0	126

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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5795114) - continued								
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	94.5	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	82.1	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	85.1	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	79.8	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5795115)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	103	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	104	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	103	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5796799)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	83.9	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5795115)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	102	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	107	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	97.5	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5796799)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	84.0	72.4	133
EP080: BTEXN (QCLot: 5796799)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	99.6	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	92.6	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	95.0	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.9	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.7	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.1	78.8	122

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
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5796710)							
ES2413694-021	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	110	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	76.2	68.0	132

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: 5796710) - continued							
ES2413694-021	Anonymous	EG005T: Copper	7440-50-8	250 mg/kg	114	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	109	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	110	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	109	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5796713)							
ES2415907-010	WC10 0.2-0.3	EG005T: Arsenic	7440-38-2	50 mg/kg	89.2	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	93.5	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.5	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	99.7	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	92.9	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	92.7	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5796709)							
ES2413694-021	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	119	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5795114)							
ES2415907-001	WC1 0.7-0.8	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	96.9	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	94.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5795115)							
ES2415907-001	WC1 0.7-0.8	EP071: C10 - C14 Fraction	----	480 mg/kg	92.3	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	85.1	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	105	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5796799)							
ES2415898-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	65.6	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5795115)							
ES2415907-001	WC1 0.7-0.8	EP071: >C10 - C16 Fraction	----	860 mg/kg	85.1	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	91.1	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	86.8	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5796799)							
ES2415898-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	65.2	61.1	142
EP080: BTEXN (QCLot: 5796799)							
ES2415898-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	80.7	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	74.0	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.9	67.4	123
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	80.6	66.4	121
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	80.3	70.7	121

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: BTEXN (QCLot: 5796799) - continued							
ES2415898-001	Anonymous	EP080: Naphthalene	91-20-3	2.5 mg/kg	70.9	61.1	115

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2415907**	Page	: 1 of 6
Client	: **ECON Environmental Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Con Kariotoglou	Telephone	: +61-2-8784 8555
Project	: PYMBLE	Date Samples Received	: 16-May-2024
Site	: ----	Issue Date	: 21-May-2024
Sampler	: Con Kariotoglou	No. of samples received	: 12
Order number	: 24-1683	No. of samples analysed	: 12

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, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Moisture Content	EA055	3	33	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

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
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
WC1 - 0.7-0.8,	WC2 - 0.4-0.5,	**16-May-2024**	**----**	----	----	**17-May-2024**	30-May-2024	✓
WC3 - 0.3-0.4,	WC4 - 1.1-1.2,							
WC5 - 0.6-0.7,	WC6 - 0.2-0.3,							
WC7 - 0.4-0.5,	WC8 - 0.6-0.7,							
WC9 - 0.9-1.0,	WC10 - 0.2-0.3,							
WC11 - 0.2-0.3,	WC12 - 0.7-0.8							
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)								
WC1 - 0.7-0.8,	WC2 - 0.4-0.5,	**16-May-2024**	**----**	----	----	**20-May-2024**	12-Nov-2024	✓
WC3 - 0.3-0.4,	WC4 - 1.1-1.2,							
WC5 - 0.6-0.7,	WC6 - 0.2-0.3,							
WC7 - 0.4-0.5,	WC8 - 0.6-0.7,							
WC9 - 0.9-1.0,	WC10 - 0.2-0.3,							
WC11 - 0.2-0.3,	WC12 - 0.7-0.8							
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
WC1 - 0.7-0.8,	WC2 - 0.4-0.5,	**16-May-2024**	**17-May-2024**	12-Nov-2024	✓	**17-May-2024**	12-Nov-2024	✓
WC3 - 0.3-0.4,	WC4 - 1.1-1.2,							
WC5 - 0.6-0.7,	WC6 - 0.2-0.3,							
WC7 - 0.4-0.5,	WC8 - 0.6-0.7,							
WC9 - 0.9-1.0,	WC10 - 0.2-0.3,							
WC11 - 0.2-0.3,	WC12 - 0.7-0.8							

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
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
WC1 - 0.7-0.8, WC2 - 0.4-0.5, WC3 - 0.3-0.4, WC4 - 1.1-1.2, WC5 - 0.6-0.7, WC6 - 0.2-0.3, WC7 - 0.4-0.5, WC8 - 0.6-0.7, WC9 - 0.9-1.0, WC10 - 0.2-0.3, WC11 - 0.2-0.3, WC12 - 0.7-0.8	**16-May-2024**	**17-May-2024**	13-Jun-2024	✓	**20-May-2024**	13-Jun-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
WC1 - 0.7-0.8, WC2 - 0.4-0.5, WC3 - 0.3-0.4, WC4 - 1.1-1.2, WC5 - 0.6-0.7, WC6 - 0.2-0.3, WC7 - 0.4-0.5, WC8 - 0.6-0.7, WC9 - 0.9-1.0, WC10 - 0.2-0.3, WC11 - 0.2-0.3, WC12 - 0.7-0.8	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**18-May-2024**	26-Jun-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
WC1 - 0.7-0.8, WC2 - 0.4-0.5, WC3 - 0.3-0.4, WC4 - 1.1-1.2, WC5 - 0.6-0.7, WC6 - 0.2-0.3	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**17-May-2024**	30-May-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
WC8 - 0.6-0.7, WC9 - 0.9-1.0, WC10 - 0.2-0.3, WC11 - 0.2-0.3, WC12 - 0.7-0.8	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**18-May-2024**	30-May-2024	✓
Soil Glass Jar - Unpreserved (EP071)							
WC1 - 0.7-0.8, WC2 - 0.4-0.5, WC3 - 0.3-0.4, WC4 - 1.1-1.2, WC5 - 0.6-0.7, WC6 - 0.2-0.3, WC7 - 0.4-0.5, WC8 - 0.6-0.7, WC9 - 0.9-1.0, WC10 - 0.2-0.3, WC11 - 0.2-0.3, WC12 - 0.7-0.8	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**20-May-2024**	26-Jun-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) WC1 - 0.7-0.8, WC2 - 0.4-0.5, WC3 - 0.3-0.4, WC4 - 1.1-1.2, WC5 - 0.6-0.7, WC6 - 0.2-0.3	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**17-May-2024**	30-May-2024	✓
Soil Glass Jar - Unpreserved (EP080) WC8 - 0.6-0.7, WC9 - 0.9-1.0, WC10 - 0.2-0.3, WC11 - 0.2-0.3, WC12 - 0.7-0.8	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**18-May-2024**	30-May-2024	✓
Soil Glass Jar - Unpreserved (EP071) WC1 - 0.7-0.8, WC2 - 0.4-0.5, WC3 - 0.3-0.4, WC4 - 1.1-1.2, WC5 - 0.6-0.7, WC6 - 0.2-0.3, WC7 - 0.4-0.5, WC8 - 0.6-0.7, WC9 - 0.9-1.0, WC10 - 0.2-0.3, WC11 - 0.2-0.3, WC12 - 0.7-0.8	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**20-May-2024**	26-Jun-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) WC1 - 0.7-0.8, WC2 - 0.4-0.5, WC3 - 0.3-0.4, WC4 - 1.1-1.2, WC5 - 0.6-0.7, WC6 - 0.2-0.3	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**17-May-2024**	30-May-2024	✓
Soil Glass Jar - Unpreserved (EP080) WC8 - 0.6-0.7, WC9 - 0.9-1.0, WC10 - 0.2-0.3, WC11 - 0.2-0.3, WC12 - 0.7-0.8	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**18-May-2024**	30-May-2024	✓
Soil Glass Jar - Unpreserved (EP080) WC7 - 0.4-0.5	**16-May-2024**	**17-May-2024**	30-May-2024	✓	**20-May-2024**	30-May-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)							
Moisture Content	EA055	3	33	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	5	32	**15.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	12	**16.67**	**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)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**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)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**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)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**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
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).
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
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)
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).
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.

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).
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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2415907**

Client	: **ECON Environmental Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Con Kariotoglou	Contact	: Customer Services ES
Address	: 1 St Aidans Avenue Oatlands 2117	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: info@econenvironmental.com.au	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: PYMBLE	Page	: 1 of 2
Order number	: 24-1683	Quote number	: ES2020ECONEV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Con Kariotoglou		

Dates

Date Samples Received	: 16-May-2024 14:15	Issue Date	: 16-May-2024
Client Requested Due Date	: 21-May-2024	Scheduled Reporting Date	: **21-May-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 13.6'C, 14.4'C, 14.2'C - Ice Bricks present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EA200G Asbestos Identification in Soils -	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2415907-001	16-May-2024 00:00	WC1 0.7-0.8	✓	✓	✓
ES2415907-002	16-May-2024 00:00	WC2 0.4-0.5	✓	✓	✓
ES2415907-003	16-May-2024 00:00	WC3 0.3-0.4	✓	✓	✓
ES2415907-004	16-May-2024 00:00	WC4 1.1-1.2	✓	✓	✓
ES2415907-005	16-May-2024 00:00	WC5 0.6-0.7	✓	✓	✓
ES2415907-006	16-May-2024 00:00	WC6 0.2-0.3	✓	✓	✓
ES2415907-007	16-May-2024 00:00	WC7 0.4-0.5	✓	✓	✓
ES2415907-008	16-May-2024 00:00	WC8 0.6-0.7	✓	✓	✓
ES2415907-009	16-May-2024 00:00	WC9 0.9-1.0	✓	✓	✓
ES2415907-010	16-May-2024 00:00	WC10 0.2-0.3	✓	✓	✓
ES2415907-011	16-May-2024 00:00	WC11 0.2-0.3	✓	✓	✓
ES2415907-012	16-May-2024 00:00	WC12 0.7-0.8	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Con Kariotoglou

- *AU Certificate of Analysis - NATA (COA)	Email	info@econenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	info@econenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	info@econenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	info@econenvironmental.com.au
- A4 - AU Tax Invoice (INV)	Email	info@econenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	info@econenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	info@econenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	info@econenvironmental.com.au

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: sydney@alsglobal.com
☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 024423 2063 E: newre@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Garbutt QLD 4814 Ph: 07 4796 0600 E: townsville@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: ECON Environmental Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☐ Standard TAT **(List due date):**	21.05.2024
OFFICE: 1 St Aidans Avenue, Oatlands NSW 2117		☐ Non Standard or urgent TAT **(List due date):**	URGENT
PROJECT: PYMBLE	**ALS QUOTE NO.:**	ECONEV	
ORDER NUMBER: 24-1683			
PROJECT MANAGER: Con Kariotoglou	**CONTACT PH:** 0452 654 962		
SAMPLER: Con Kariotoglou	**SAMPLER MOBILE:** 0452 654 962		
COC emailed to ALS? (YES)	**EDD FORMAT (or default):**		
Email Reports to (will default to PM if no other addresses are listed): **info@econenvironmental.com.au**			
Email Invoice to (will default to PM if no other addresses are listed): **info@econenvironmental.com.au**			

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Con Kariotoglou			
DATE/TIME: 16.05.2024	DATE/TIME: 16/5/24 1415	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S-26	Asbestos EA200G (absent/present)	IN-4S (pH+Ec)	NT-S2 (Chloride & Sulfate)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	WC1 0.7-0.8	16.05.2024	S		2	√	√						
2	WC2 0.4-0.5	16.05.2024	S		2	√	√						
3	WC3 0.3-0.4	16.05.2024	S		2	√	√						
4	WC4 1.1-1.2	16.05.2024	S		2	√	√						
5	WC5 0.6-0.7	16.05.2024	S	Subcon / Forward Lab / Split WO	2	√	√						
6	WC6 0.2-0.3	16.05.2024	S	Lab / Analysis: Newcastle → asbestos	2								
7	WC7 0.4-0.5	16.05.2024	S	Organised By / Date:	2	√	√						
8	WC8 0.6-0.7	16.05.2024	S	Relinquished By / Date:	2	√	√						
9	WC9 0.9-1.0	16.05.2024	S	Connote / Courier:	2	√	√						
10	WC10 0.2-0.3	16.05.2024	S	WO No:	2	√	√						
11	WC11 0.2-0.3	16.05.2024	S	Attached By PO / Internal Sheet:	2	√	√						
12	WC12 0.7-0.8	16.05.2024	S		2	√	√						
				TOTAL	24	12	12						

TAT

Environmental Division Sydney
Work Order Reference
ES2415907

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl prese Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

APPENDIX C: NEPM LAND USE RESULT TABLES

ECON Environmental Pty Ltd | ABN 25 641 106 783 | PO Box 85 Oatlands NSW 2117
M: 0452 654 962 | **E:** info@econenvironmental.com.au | **W:** www.econenvironmental.com.au

TABLE B

HEAVY METALS TEST RESULTS FOR HILs & ESLs

Sample Location	Sample Date	Depth (m)	ARSENIC	CADMIUM	CHROMIUM (VI)	COPPER	MERCURY	NICKEL	LEAD [g]	ZINC
		Analyte	HEAVY METALS (mg/kg)							
WC1	16.05.2024	0.7-0.8	5	<1	13	11	<0.1	3	28	12
WC2	16.05.2024	0.4-0.5	11	<1	24	31	<0.1	25	30	59
WC3	16.05.2024	0.3-0.4	6	<1	19	31	0.2	23	24	63
WC4	16.05.2024	1.1-1.2	<5	<1	38	17	<0.1	30	8	27
WC5	16.05.2024	0.6-0.7	5	<1	14	24	<0.1	8	30	86
WC6	16.05.2024	0.2-0.3	8	<1	19	18	<0.1	6	33	31
WC7	16.05.2024	0.4-0.5	8	<1	17	25	<0.1	5	44	47
WC8	16.05.2024	0.6-0.7	5	<1	11	23	0.1	4	46	52
WC9	16.05.2024	0.9-1.0	<5	<1	8	15	<0.1	4	25	51
WC10	16.05.2024	0.2-0.3	<5	<1	11	50	<0.1	5	31	93
WC11	16.05.2024	0.2-0.3	9	<1	23	12	<1	<2	24	6
WC12	16.05.2024	0.7-0.8	<5	<1	8	24	0.4	5	26	36
Practical Quantitation Limits (PQL)			5	1	2	5	0.1	2	5	5
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)										
Health Investigation Levels (HIL) - Table 1A (1)										
HIL A [a]			100	20	100	6000	40[e] / 10[f]	400	300	7400
HIL B [b]			500	150	500	30,000	120[e] / 30[f]	1200	1200	60,000
HIL C [c]			300	90	300	17,000	80[e] / 13[f]	1200	600	30,000
HIL D [d]			3000	900	3600	240,000	730[e] / 180[f]	6000	1500	400,000
Ecological Investigation Levels (EIL) - Table 1B (5)										
Areas of ecological significance			40[h]							
Urban residential and public open space [i]			100[h]							
Commercial and industrial			160[h]							

Notes

a: Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.

b: Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high rise buildings and apartments.

c: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate

d: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

e: Elemental mercury: HIL does not address elemental mercury. A site-specific assessment should be considered if elemental mercury is present, or suspected to be present,

f: Methyl mercury: assessment of methyl mercury should only occur where there is evidence of its potential source. It may be associated with inorganic mercury and anaerobic microorganism activity in aquatic environments. In addition the reliability and quality of sampling/analysis should be considered.

g: Lead: HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.

h: Aged values are applicable to arsenic contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.

i: Urban residential / public open space is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.

TABLE C
TOTAL RECOVERABLE HYDROCARBONS (TRH), BTEX AND NAPHTHALENE TEST RESULTS
FOR HSLs IN SAND

Analyte / Sample Location	Sample Date	Depth (m)	TRH (mg/kg) F1 [a]	TRH (mg/kg) F2 [b]	BTEX (mg/kg) BENZENE	BTEX (mg/kg) TOLUENE	BTEX (mg/kg) ETHYL BENZENE	BTEX (mg/kg) TOTAL XYLENES	PAH (mg/kg) NAPHTHALENE
WC1	16.05.2024	0.7-0.8	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC2	16.05.2024	0.4-0.5	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC3	16.05.2024	0.3-0.4	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC4	16.05.2024	1.1-1.2	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC5	16.05.2024	0.6-0.7	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC6	16.05.2024	0.2-0.3	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC7	16.05.2024	0.4-0.5	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC8	16.05.2024	0.6-0.7	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC9	16.05.2024	0.9-1.0	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC10	16.05.2024	0.2-0.3	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC11	16.05.2024	0.2-0.3	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
WC12	16.05.2024	0.7-0.8	<10	<50	<0.2	<0.5	<0.5	<0.5	<1
Practical Quantitation Limits (PQL)			10	50	0.2	0.5	0.5	0.5	1
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)									
Health Screening Levels (HSL) - Table 1A (3)									
HSL A & HSL B: Low-high density residential									
Source depth - 0m to <1m			45	110	0.5	160	55	40	3
Source depth - 1m to <2m			70	240	0.5	220	NL	60	NL
Source depth - 2m to <4m			110	440	0.5	310	NL	95	NL
Source depth - 4m +			200	NL	0.5	540	NL	170	NL
HSL C: recreational / open space									
Source depth - 0m to <1m			NL	NL	NL	NL	NL	NL	NL
Source depth - 1m to <2m			NL	NL	NL	NL	NL	NL	NL
Source depth - 2m to <4m			NL	NL	NL	NL	NL	NL	NL
Source depth - 4m +			NL	NL	NL	NL	NL	NL	NL
HSL D: Commercial / Industrial									
Source depth - 0m to <1m			260	NL	3	NL	NL	230	NL
Source depth - 1m to <2m			370	NL	3	NL	NL	NL	NL
Source depth - 2m to <4m			630	NL	3	NL	NL	NL	NL
Source depth - 4m +			NL	NL	3	NL	NL	NL	NL

Notes
a: To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.
b: To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.
NL: Not Limiting

TABLE D
TOTAL RECOVERABLE HYDROCARBONS (TRH), BTEX AND BENZO(a)PYRENE TEST RESULTS
ESLs FOR COARSE GRAINED SOIL TEXTURE

Analyte			TRH (mg/kg)				BTEX (mg/kg)				PAH (mg/kg)
			F1 (C_6-C_{10}) [a]	F2 (>C_{10}-C_{16}) [b]	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{40})	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	BENZO(a)PYRENE
Sample Location	Sample Date	Depth (m)									
WC1	16.05.2024	0.7-0.8	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC2	16.05.2024	0.4-0.5	<10	<50	190	140	<0.2	<0.5	<0.5	<0.5	<0.5
WC3	16.05.2024	0.3-0.4	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC4	16.05.2024	1.1-1.2	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC5	16.05.2024	0.6-0.7	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC6	16.05.2024	0.2-0.3	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC7	16.05.2024	0.4-0.5	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC8	16.05.2024	0.6-0.7	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC9	16.05.2024	0.9-1.0	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC10	16.05.2024	0.2-0.3	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC11	16.05.2024	0.2-0.3	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
WC12	16.05.2024	0.7-0.8	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
Practical Quantitation Limits (PQL)			10	50	100	100	0.2	0.5	0.5	5	0.5
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)											
Ecological Screening Levels (ESL) - Table 1B (6)											
Areas of ecological significance			125*	25*	-	-	10	10	1.5	10	0.7
Urban residential and public open space			180*	120*	300	2800	50	85	70	105	0.7
Commercial and industrial			215*	170*	1700	3300	75	135	165	180	0.7

Notes
a: To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.
b: To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.
*: ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.
"-": "-" indicates that insufficient data was available to derive a value.

TABLE E
TOTAL RECOVERABLE HYDROCARBONS (TRH) TEST RESULTS
MANAGEMENT LIMITS FOR FINE GRAINED SOIL TEXTURE

Analyte / Sample Location	Date Sampled	Depth (m)	TRH (mg/kg) F1 (C_6-C_{10}) [a]	F2 (>C_{10}-C_{16}) [a]	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{40})
WC1	16.05.2024	0.7-0.8	<10	<50	<100	<100
WC2	16.05.2024	0.4-0.5	<10	<50	190	140
WC3	16.05.2024	0.3-0.4	<10	<50	<100	<100
WC4	16.05.2024	1.1-1.2	<10	<50	<100	<100
WC5	16.05.2024	0.6-0.7	<10	<50	<100	<100
WC6	16.05.2024	0.2-0.3	<10	<50	<100	<100
WC7	16.05.2024	0.4-0.5	<10	<50	<100	<100
WC8	16.05.2024	0.6-0.7	<10	<50	<100	<100
WC9	16.05.2024	0.9-1.0	<10	<50	<100	<100
WC10	16.05.2024	0.2-0.3	<10	<50	<100	<100
WC11	16.05.2024	0.2-0.3	<10	<50	<100	<100
WC12	16.05.2024	0.7-0.8	<10	<50	<100	<100
Practical Quantitation Limits (PQL)			10	50	100	100
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)						
Management Limits - Table 1B (7)						
Residential parkland and public open space			700	1000	2500	10,000
Commercial and industrial			700	1000	3500	10,000

Notes a: Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

b: Management limits are applied after consideration of relevant ESLs and HSLs.

TABLE F

POLYCYCLIC AROMATIC HYDROCARBONS (PAH), TEST RESULTS FOR HILs, EILs & ESLs

Analyte / Sample Location	Sample Date	Depth (m)	PAH (mg/kg) Carcinogenic PAHs (as BaP TEQ) [e]	TOTAL PAHs [f]	BENZO(a)PYRENE	NAPHTHALENE
WC1	16.05.2024	0.7-0.8	0.6	<0.5	<0.5	<0.5
WC2	16.05.2024	0.4-0.5	0.6	<0.5	<0.5	<0.5
WC3	16.05.2024	0.3-0.4	0.6	<0.5	<0.5	<0.5
WC4	16.05.2024	1.1-1.2	0.6	<0.5	<0.5	<0.5
WC5	16.05.2024	0.6-0.7	0.6	<0.5	<0.5	<0.5
WC6	16.05.2024	0.2-0.3	0.6	<0.5	<0.5	<0.5
WC7	16.05.2024	0.4-0.5	0.6	<0.5	<0.5	<0.5
WC8	16.05.2024	0.6-0.7	0.6	<0.5	<0.5	<0.5
WC9	16.05.2024	0.9-1.0	0.6	<0.5	<0.5	<0.5
WC10	16.05.2024	0.2-0.3	0.6	<0.5	<0.5	<0.5
WC11	16.05.2024	0.2-0.3	0.6	<0.5	<0.5	<0.5
WC12	16.05.2024	0.7-0.8	0.6	<0.5	<0.5	<0.5
Practical Quantitation Limits (PQL)			0.5	0.5	0.5	0.5
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)						
Health Investigation Levels (HIL) - Table 1A (1)						
HIL A [a]			3	300		
HIL B [b]			4	400		
HIL C [c]			3	300		
HIL D [d]			40	4000		
Ecological Investigation Levels (EIL) - Table 1B (5)						
Areas of ecological significance						10 [g]
Urban residential and public open space [h]						170 [g]
Commercial and industrial						370 [g]
Ecological Screening Levels (ESL) - Table 1B (6)						
Areas of ecological significance					0.7 [i]	
Urban residential and public open space					0.7 [i]	
Commercial and industrial					0.7 [i]	

Notes

a: Residential with garden/accessible soil (home grown poduce

b: Residential with minimal opportunities for soil access; includes

c: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not

d: Commercial/industrial, includes premises such as shops, offices,

e: Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their TEFs (potency relative to B(a)P) adopted by CCME 2008

PAH species	TEF	PAH species
Benzo(a)anthracen	0.1	Benzo(g,h,i)perylene
Benzo(a)pyrene	1	Chrysene
Benzo(b+j)fluoranthe	0.1	Dibenz(a,h)anthracene
Benzo(k)fluoranthe	0.1	Indeno(1,2,3-c,d)pyrene

Where the B(a)P occurs in bitumen fragments it is relatively

f: Total PAHs: HIL is based on the sum of the 16 PAHs most commonly reported for contaminated sites (WHO 1998). The

g: Insufficient data was available to calculate aged values for DDT

h: Urban residential / public open space is broadly equivalent to

i: For coarse and fine grained texture soils.

j: PCBs: HIL relates to non-dioxin-like PCBs only. Where a PCB source is known, or suspected, to be present at a site, a site-

k: For DDT only.

TABLE G
ASBESTOS TEST RESULTS

Analyte / Sample Location	Sample Date	Depth (m)	Field Observations*	Laboratory Results Asbestos Type Present / Absent	Laboratory Results Asbestos %w/w
WC1	16.05.2024	0.7-0.8	No visible ACM fragments observed	No Asbestos detected	NT
WC2	16.05.2024	0.4-0.5	No visible ACM fragments observed	No Asbestos detected	NT
WC3	16.05.2024	0.3-0.4	No visible ACM fragments observed	No Asbestos detected	NT
WC4	16.05.2024	1.1-1.2	No visible ACM fragments observed	No Asbestos detected	NT
WC5	16.05.2024	0.6-0.7	No visible ACM fragments observed	No Asbestos detected	NT
WC6	16.05.2024	0.2-0.3	No visible ACM fragments observed	No Asbestos detected	NT
WC7	16.05.2024	0.4-0.5	No visible ACM fragments observed	No Asbestos detected	NT
WC8	16.05.2024	0.6-0.7	No visible ACM fragments observed	No Asbestos detected	NT
WC9	16.05.2024	0.9-1.0	No visible ACM fragments observed	No Asbestos detected	NT
WC10	16.05.2024	0.2-0.3	No visible ACM fragments observed	No Asbestos detected	NT
WC11	16.05.2024	0.2-0.3	No visible ACM fragments observed	No Asbestos detected	NT
WC12	16.05.2024	0.7-0.8	No visible ACM fragments observed	No Asbestos detected	NT
WA Guidelines for the Assessment, Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009					
National Environment Protection (Assessment of Site Contamination) Measure 2013 Schedule B1					
%w/w asbestos for FA and AF					0.001%
%w/w asbestos for ACM - Residential use, childcare centres, preschools etc.					0.01%
%w/w asbestos for ACM - Residential, minimal soil access (fully sealed surfaces)					0.04%
%w/w asbestos for ACM - Parks, public open spaces, playing fields etc.					0.02%
%w/w asbestos for ACM - Commercial / Industrial					0.05%

Note:

ACM = Asbestos Containing Materials >7mm x 7mm (visible by eye)

FA = Friable and Fibrous Asbestos Materials >7mm x 7mm (visible by eye)

AF = Asbestos Fines <7mm x 7mm ACM including free fibres (visible by microscope only)

* Field Observations: All fibro-cement fragments observed are assumed to contain Asbestos until otherwise tested and recorded as such.

NT = Not Tested

*No Asbestos detected**' - 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.*