

## Pre-Construction Minor Works Approval Form

Minor Works are defined as any low impact activities that are undertaken prior to the commencement of ‘construction’ as defined in the project’s applicable planning approval. However if Minor Works affect or potentially affect heritage items, threatened species, populations or endangered ecological communities, these works are defined as ‘construction’ unless otherwise determined by the applicable planning authority.

Minor Works approvals do not remove any obligation to comply with the project’s applicable planning approval conditions (including requirements prior to ‘any works’ commencing) or obtain any other applicable permits, licenses or approvals as necessary.

This application and all supporting information must be submitted to Sydney Metro/the Environmental Representative as one (1) PDF file at least 10 business days prior to the commencement of the proposed Minor Works.

Part 1: Application	
<b>Contractor:</b>	Nation Partners
<b>Project:</b>	Sydney Metro
<b>Application Title:</b> (e.g. Smith St trenching works)	Chatswood Pre-remediation Investigation
<b>Application Number:</b>	NP_MWA_04
<b>Application Date:</b>	11 September 2023
<b>Planning Approval:</b>	SSI_7400
<b>Minor Works Categories:</b> <ul style="list-style-type: none"> <li>Highlight as applicable.</li> <li>If Items 4, 8 or 11 are applicable, this form must be endorsed by an Environmental Representative.</li> </ul>	<ol style="list-style-type: none"> <li><b>Survey, survey facilitation and investigations works (including road and building dilapidation survey works, drilling and excavation).</b></li> <li>Treatment of contaminated sites.</li> <li>Establishment of ancillary facilities (excluding demolition), including construction of ancillary facility access roads and providing facility utilities.</li> <li>Operation of ancillary facilities that have minimal impact on the environment and community.</li> <li>Minor clearing and relocation of vegetation (including native).</li> <li>Installation of mitigation measures, including erosion and sediment controls, temporary exclusion fencing for sensitive areas and acoustic treatments.</li> <li>Property acquisition adjustment works, including installation of property fencing and utility relocation and adjustments to properties.</li> <li>Utility relocation and connections.</li> <li>Maintenance of existing buildings and structures.</li> <li>Archaeological testing under the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010) or archaeological monitoring undertaken in association with other Minor Works to ensure there is no impact on heritage items.</li> <li>Any other activities that have minimal environmental impact, including construction of minor access roads, temporary relocation of pedestrian and cycle paths and the provision of property access.</li> </ol>
<b>Planning Authority Determination:</b> Will the proposed works affect or have the potential to affect heritage items, threatened species, populations or endangered ecological communities?	<p><b>No</b> – Mowbray house and its curtilage are listed as local heritage, the works will avoid this area.</p> <p>Some areas within the Chatswood Dive site have been identified as having moderate archaeological potential in the <i>Sydney Metro, City &amp; Southwest Archaeological Method Statement for Chatswood Dive, Prepared by AMBS Ecology &amp; Heritage for John Holland CPB Ghella Joint VentureV,(October 2017)</i>.</p> <p>No soil disturbance will occur within these areas, as per Figure 2 in Appendix 1: Environmental Control Map and Environmental Risk Assessment.</p>

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**Part 2: Details**

<p><b>Describe the proposed Minor Works:</b> Including work methodologies, site location(s) and site description(s) (e.g. landscape type, waterways, etc.).</p>	<p><b>Location:</b> These works are proposed to occur within the vicinity of the principal contractor at the Chatswood Dive site.</p> <p><b>Activity description</b> 1. General site investigation activities: Drive to/from Chatswood, site inspection, service locating, service clearances, 2. Groundwater investigation activities: Groundwater well purging and development, groundwater sampling, 3. Asbestos in soils investigation activities: Test pit digging, including surface slab concrete cutting, soil sampling</p> <p><b>Description</b></p> <p>Preliminaries:</p> <ul style="list-style-type: none"> <li>Preparation of an updated sampling analysis and quality plan (SAQP) to scope and guide the sampling works</li> <li>Preparation of an updated Health, Safety and Environment Plan (HSEMP) and Safe Work Method Statements (SWMS) for the fieldworks.</li> </ul> <p>Groundwater Investigation:</p> <ul style="list-style-type: none"> <li>Purge dry and sample (if adequately recharged) 4 shallow groundwater wells</li> <li>Redevelop and sample 14 existing deep groundwater wells</li> <li>Sampling and analysis for PFAS with current nationally endorsed criteria (PFOS2, PFOA3, and PFHxS4)</li> <li>Install pressure transducers in up to 6 deep monitoring wells for a period of at least four weeks</li> </ul> <p>Asbestos in Soils Investigation:</p> <ul style="list-style-type: none"> <li>Underground service locating at up to 40 locations across the site</li> <li>Concrete cutting 40 x approximately 0.8 m by 2.0 m areas to allow advancement of test pits to approximately 2 mbgl.</li> <li>Removal of the concrete with an excavator with hammer attachment.</li> <li>Collection of 2 bulk fill samples per location by excavator with a bucket</li> <li>Collection and analysis of select samples for waste classification data</li> <li>Backfill of test pit locations with spoil and broken concrete slab and surface reinstatement using road-plates</li> </ul>
<p><b>Planned Commencement Date:</b></p>	<p>18 September</p>
<p><b>Local Sensitivities:</b> Describe the presence (if any) of local sensitive environmental areas and community receptors</p>	<p>Nil</p>

**Part 3: Environmental Risk Assessment and Management**

Prepare an Environmental Risk Assessment (in accordance with the [Sydney Metro Risk Management Standard](#)) and an Environmental Control Map for the proposed Minor Works and attach as Appendix 1.  
If an Environmental Risk Assessment and/or an Environmental Control Map for the proposed Minor Works is/are already contained in existing documentation, attach the relevant section(s) as Appendix 1.

<p><b>Documentation:</b> List any existing documents (including those referenced above) that the proposed Minor Works will be undertaken in accordance with and attach as Appendix 2 (e.g. plans, procedures, etc.).</p>	<p>Appendix 2: Nation Partners Chatswood Metro Pre-Remediation Investigation Health, Safety and Environment Plan (HSEP) (Version 2.0, 8 September 2023)</p> <p>Appendix 3: Community Notification.</p> <p>Appendix 4: Nation Partners Chatswood Pre-Remediation Investigation Sampling Analysis &amp; Quality Plan (SAQP) inc. Sydney Metro Unexpected Heritage Finds Procedure (Version 5.0, 24 April 2023)</p>
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**Part 4: Workforce Notification**

<p><b>How will the environmental and community risks and associated mitigation measures of the proposed Minor Works be communicated to the contractor's workforce?</b></p>	<p>Site induction Pre-start toolbox Environmental Safe Works Method Statement (ESWMS)</p>
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**Part 5: Community Consultation**

<p><b>What community consultation has been undertaken already?</b></p>	<p>Nil</p>
<p><b>What community consultation is planned to be undertaken?</b></p>	<p>The monthly newsletter references these works. Given they will be completed within the standard construction hours and listed activities for the site no specific consultation is expected to take place.</p>
<p>If drafted already, attach applicable Community Notification as Appendix 3: Community Notification..</p>	

**Part 6: Contact Details**

<p>Nominate contractor's project manager, environmental and communications contact(s).</p>					
<b>Name:</b>	Liam Gooley	<b>Position:</b>	Project Director	<b>Phone:</b>	0418 689 493
	Bradley Coates		Project Manager		0404 236 106
	Nelson Phillips		Field Manager		0400 734 125

**Part 7: Signature**



<p>This signature acknowledges that the proposed Minor Works will be undertaken in accordance with this application, have minimal environmental impact and are not defined as 'construction' in accordance with the applicable planning approval.</p>			
<b>Name:</b>	Bradley Coates		
<b>Signature:</b>		<b>Date:</b>	13 September 2023

## Determination Page

### (Sydney Metro/Environmental Representative Use Only)

#### 12. Endorsement/Approval

These signatures represent formal endorsement/approval for the proposed Minor Works to commence in accordance with this application and the applicable planning approval requirements (subject to any determination from the applicable planning authority as may be required by the planning approval conditions).

	Director Project Communications – Endorsement (required for all applications)	Director Environment, Sustainability & Planning – Approval (required for all applications)	Environmental Representative – Endorsement (required as necessary in accordance with the applicable planning approval, optional for all other circumstances)
Signature:			
Name:	Natalia Kuirintinus	Fil Cerone	
Date:	13 September 2023	14 September	
Comments:			<i>Supporting letter attached as Appendix 4 if necessary.</i>
Conditions:			<i>Supporting letter attached as Appendix 4 if necessary.</i>
<input type="checkbox"/>	Approved (by Sydney Metro)		
<input type="checkbox"/>	Endorsed (by Environmental Representative)		
<input type="checkbox"/>	Rejected		

# Appendix 1: Environmental Control Map and Environmental Risk Assessment

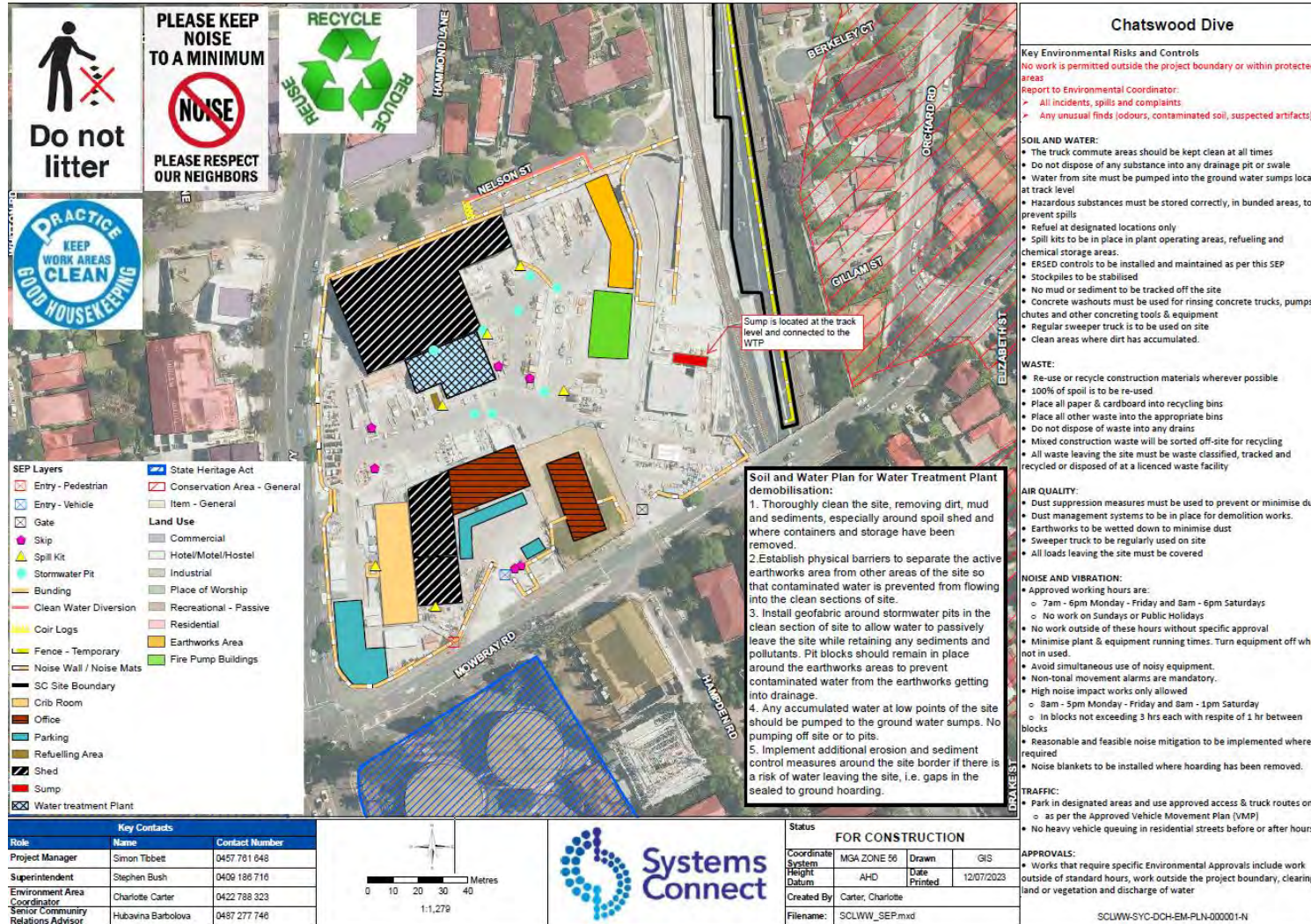
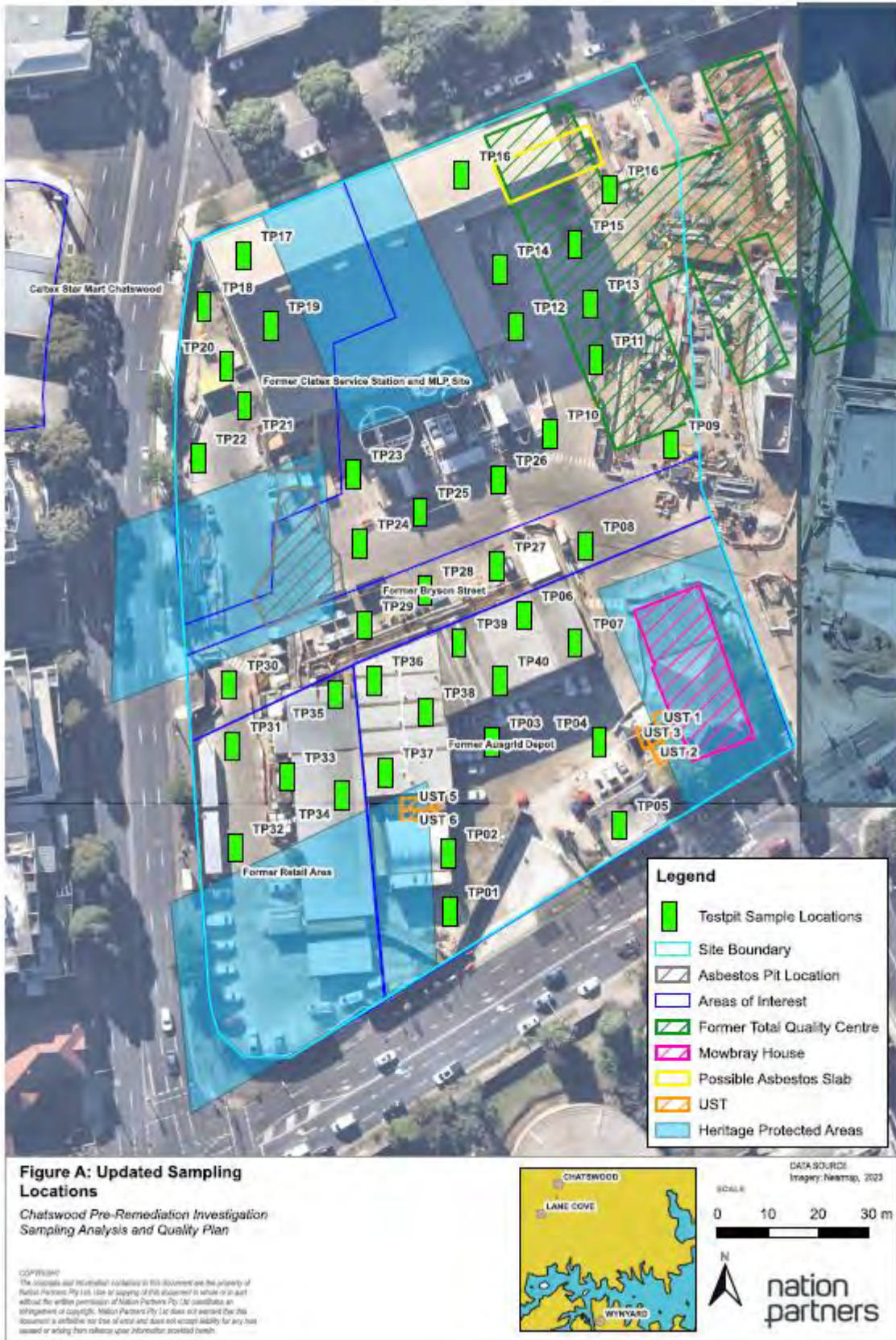


Figure 1 Systems Connect Site Environment Plan



Environment Hazards, Risks & Controls			
What are the tasks involved?	What are the hazards and risks?	What are the controls measures?	What is the residual risk rating?
Site works cause pollution from waste	Contamination of environmental receptors Non-compliance with regulations	<b>Elimination</b> – Waste should be minimise during site works. Work area to be kept tidy and clean <b>Engineering Controls</b> - Nation Partners to establish drums or intermediate bulk containers for all waste, temporary storage and will appropriately dispose of these. Classify waste according to EPA waste classification guidelines. Label waste to facilitate recycling and avoid cross-contamination <b>Administrative</b> - Conduct a Take 5, toolbox talk, and an induction to communicate any potential risks and remind the avoid, reduce, reuse and recycle principles. Keep waste classification documentation for appropriate disposal.	Moderate
Opening well heads	Items falling down monitoring well	<b>Elimination</b> - Remove objects from top pockets or fasten pockets. Avoid holding unrestrained equipment or objects near the well head.	Low
Entering and leaving site by car	Spread of invasive species and pathogens, disturbance to flora and fauna	<b>Elimination</b> – Plant and vehicles to be clean prior to entering site. Local requirements in relation to level of invasive species control must be checked and followed (where relevant). <b>Isolation &amp; Engineering Controls</b> – Plant to be unloaded as close to test pit as possible. Minimise vegetation damage by tracking on established paths. Do not remove or damage vegetation unless clearing has been previously agreed. <b>Administration</b> - Visually inspect plant and vehicles before leaving site – they must be free of loose materials such as mud and vegetation. Follow SGW induction requirements in relation to decontamination.	Low
Soil sampling	Collection of large quantity of bulk soil bags and jars	<b>Substitution</b> – Where possible transfer samples directly into site vehicle for transport to laboratory. <b>Engineering Controls</b> – Transport samples from sampling area to site vehicle on a trolley. <b>PPE</b> – Adopt minimum standards of PPE for appropriate type of work / equipment used. Gloves available for works and suitable footwear.	



Filepath: Synergy Resource Management/SRM430 - Chatswood Test Pitting (Nation Partners)/Site Team

Template ID: ESWMS01  
Template Version: 5  
Form Version: 2

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations	Noise	Noise disturbance to sensitive receivers in vicinity	13	<ul style="list-style-type: none"> <li>Working hours restricted to 7.00am - 5.00pm Monday to Friday, with no works permitted on Saturdays, Sundays, or Public Holidays</li> <li>Ensure that appropriate noise restricting devices are fitted &amp; functioning correctly on all vehicles, plant &amp; equipment</li> <li>Operate vehicles, plant &amp; equipment in a manner that does not generate unnecessary noise, such as avoiding excessive engine revving etc.</li> <li>Vehicles, plant &amp; equipment to be turned off when not in use</li> <li>Vehicles, plant &amp; equipment shall be maintained regularly &amp; serviced as per manufacturer's specifications</li> </ul>	SRM Project Supervisor	24
		Noise & vibration	16	<ul style="list-style-type: none"> <li>Exhaust system mufflers to be fitted and functioning correctly on all plant / vehicles</li> <li>Operate plant / vehicles in a manner that does not generate unnecessary noise, through avoiding excessive engine revving etc.</li> <li>Plant / equipment speeds to observe 10km/h speed limit on the site</li> <li>Plant / vehicles to be turned off when not in use</li> </ul>	Operator	24
		Dust	11	<ul style="list-style-type: none"> <li>Utilise the existing paved roadways through the Site for the access / egress of vehicles associated with the works</li> <li>Impose a 10km/h speed limit for vehicles on the Site</li> <li>Regularly dampen the roadways with a waterCart</li> <li>Limiting ground disturbance to the immediate areas of the Site required to perform the remediation works</li> <li>Supressing dust during materials handling operations with water spray / mist</li> <li>Temporarily cease materials handling operations during high-wind conditions</li> <li>Disturbed stockpiled materials being covered with plastic sheeting when access is not required</li> <li>Vehicles transporting materials from the Site to have sealed bodies and their loads covered</li> </ul>	SRM Project Supervisor	22

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
		Emissions	13	<ul style="list-style-type: none"> <li>Exhaust system mufflers to be fitted and functioning correctly on all plant / equipment</li> <li>Drivers / operators to be instructed to operate plant / equipment in a manner that avoids excessive engine revving</li> <li>Limiting vehicles speeds on the Site to 20km/h</li> <li>Plant / equipment to be turned off when not in use</li> <li>Plant / equipment to be maintained regularly and serviced as per the manufacturer's specifications</li> </ul>	SRM Project Supervisor	20
	Cultural heritage	Damage to sites / items of indigenous / historic cultural significance	14	<ul style="list-style-type: none"> <li>In the unlikely event that potential objects or places of indigenous / historic cultural heritage significance are identified during the Works, activities shall cease immediately with advice sought from the Principal's project representative in accordance with the <del>Sydney</del> Unexpected Findings Protocol</li> </ul>	SRM Project Supervisor	19
	Erosion & sedimentation	Soil erosion, contamination of stormwater system or local waterway	13	<ul style="list-style-type: none"> <li>Keep amount of water used for dust suppression to a minimum in order to prevent run-off</li> <li>Sediment filters to be installed on all existing kerb inlets Stormwater drainage inlets located within work area &amp; in vicinity of the Site to be protected with sediment traps</li> </ul>	SRM Project Supervisor	20
	Leaks & spills	Contamination of soils, groundwater or waterway	11	<ul style="list-style-type: none"> <li>Utilise designated refuelling contractor if servicing the site where practicable</li> <li>Persons to be trained &amp; competent</li> </ul>	SRM Project Supervisor	22
			11	<ul style="list-style-type: none"> <li>Refuelling operations are to be supervised by persons operating the fuel line at all times and under no circumstances shall refuelling operations be left unattended</li> <li>Refuelling to take place on hard stand where practicable</li> <li>Follow handling &amp; storage guidelines in SDS</li> <li>Keep spill kit readily available</li> <li>Use suitable funnel, pouring tube or hose</li> </ul>	Individual Workers	22
	Leaks & spills	Contamination of soils, groundwater or waterway	11	<ul style="list-style-type: none"> <li>Minimise quantities of HS&amp;DG stored on site</li> <li>Store HS&amp;DG in suitable containers</li> <li>HS&amp;DG storage containers to have bunded floor or drip trays</li> <li>Ensure SDS for HS&amp;DG are readily available</li> <li>Maintain suitable spill kit in vicinity of HS&amp;DG storage locations</li> </ul>	SRM Project Supervisor	22
			11	<ul style="list-style-type: none"> <li>Ensure HS&amp;DG storage containers are clearly labelled</li> </ul>	Individual Workers	22
Excavation & handling of ACM	Asbestos in soils	Exposure to asbestos fibres	3	<ul style="list-style-type: none"> <li>Ensure all personnel are made aware of asbestos hazards &amp; necessary control measures required during the site induction process &amp; daily pre-start meetings</li> <li>Maintain exclusion zone for all non-essential personnel around the area where hazardous materials removal is taking place</li> <li>Install "Danger - Asbestos" warning signage on exclusion zone boundary</li> <li>Install &amp; maintain decontamination station on geofabric catchment layer</li> <li>All personnel to be trained in the decontamination procedure</li> <li>All personnel supplied with &amp; trained in use, storage &amp; disposal of PPE</li> </ul>	Asbestos Removal Supervisor	15
			3	<ul style="list-style-type: none"> <li>All personnel to wear disposable coveralls, nitrile gloves &amp; respirator with P2 filters before entering &amp; at all times when in the exclusion zone</li> <li>Apply water mist/spray to the work area &amp; ACM contaminated material handling operations</li> </ul>	Individual Workers	15





Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Excavation & handling of ACM	Underground infrastructure or services	Striking underground infrastructure or services	3	<ul style="list-style-type: none"> <li>Review Dial Before Your Dig Plans to identify underground services</li> <li>Engage professional utilities location contractor to perform subsurface screening using electronic detection equipment to pinpoint the location of underground services / infrastructure within work area</li> <li>Positively identify services within the excavation footprint prior to any works commencing</li> </ul>	SRM Project Supervisor	15

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## **Appendix 2: Nation Partners Chatswood Metro Pre-Remediation Investigation Health, Safety and Environment Plan (HSEP)**

8 September 2023

# Chatswood Metro Pre- Remediation Investigation Health, Safety and Environment Plan (HSEP)

## We help solve complex problems for projects.

We believe that well-planned and targeted advice can help shape a project that is not only better developed, but is delivered more effectively, with greater acceptance and positive outcomes.

Nation Partners isn't your regular consulting firm. A certified B Corporation, we attract and develop the brightest thinkers and take an active part in shaping the world.

With expertise in projects in the government, transport, water, property and urban development sectors, we provide a suite of services aptly tailored to each client and project at hand.

We acknowledge the Traditional Custodians of the land on which we work and live, and recognise their continuing connection to land, water, and community. We pay our respects to Elders past, present and emerging.

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Document title  
Chatswood Pre-Remediation Investigation –  
Health, Safety and Environment Plan

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Version  
2.0

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Date  
8 September 2023

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Prepared by  
Ryan Thomson

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Approved by  
Liam Gooley

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File name  
NP22202 HSEP Chatswood Pre-Remediation  
v2.0

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# 1 Introduction

## 1.1 Purpose and Scope

Nation Partners Pty Ltd (Nation Partners) has been engaged by Sydney Metro to undertake a Pre-Remediation Investigation for the Chatswood Metro site located at the north-east corner of the Pacific Highway and Mowbray Road, Chatswood (the site). The location and boundary of the site are shown on **Figure 1**.

This Pre-Remediation Investigation will address data gaps identified in a previous investigation (Chatswood *Data Gap Investigation*, Nation Partners, 2021). To address Sydney Metro concerns regarding the nature of the works being an asbestos in soil investigation, and the associated insurance liabilities, Nation Partners has subcontracted scope elements to Synergy Resource Management Pty Ltd (Synergy). Synergy are a civil contractor specialising in environmental remediation, who hold a Class A asbestos licence and are insured for asbestos liability. Synergy will undertake the physical ground disturbance works, provide an occupational hygienist for the duration of the works, undertake asbestos air monitoring, and note Nation Partners and Sydney Metro as insured parties with respect to asbestos liability for the project on their Public Liability insurance.

The site is currently occupied by Systems Connect (an unincorporated joint venture between CPB Contractors and UGL), for line-wide construction activities. This Health, Safety and Environment Plan (HSEP) has been prepared in line with the Systems Connect construction environmental management plan (CEMP) and sub-plans.

## 1.2 Objectives

This HSEP has been developed as an overarching document for the management of health, safety and environmental risks for the work to be undertaken by Nation Partners and sub-contractors at Sydney Metro's Chatswood site.

The objectives of HSEP are to:

- Ensure all activities comply with applicable legal requirements and guidelines;
- Ensure the management of HSE during the site investigation is consistent with Nation Partners and Sydney Metro requirements;
- Ensure that foreseeable HSE risks are appropriately identified and managed through the hazard identification, risk assessment and control process;
- Protect environment and heritage values; and
- Promote reduction and prevention of pollution, efficient use of resources and energy and biodiversity protection.

A hard copy of this HSEP will be available on site at all times and electronic copies will be shared via email. All parties involved in the works will conduct their operations in accordance with this HSEP, the project requirements and applicable legal and other requirements. The HSEP will be regularly monitored and reviewed to ensure currency and effectiveness. Opportunities will be sought for continuous improvement and amendments made to health and safety systems and documentation as appropriate.

## 1.3 Approvals

This HSEP is subject to the approval of Nation Partners and Sydney Metro.

## 1.4 Guidelines and Legislation

This HSEP has been developed in accordance with the management plans of the primary contractor currently operating the site, Systems Connect. These management plans include:

- Site Environment Plan – Systems Connect (**Appendix A**)
- Construction Environmental Management Plan – Systems Connect
- Construction Noise and Vibration Management Plan – Systems Connect
- Air Quality Management Sub-Plan - Systems Connect
- Flora, Fauna and Biodiversity Management Sub-Plan – Systems Connect
- Heritage Management Sub-Plan – Systems Connect
- Soil, Water and Groundwater Management Sub-Plan - Systems Connect
- Visual Amenity Management Sub-Plan – Systems Connect
- Waste, Spoil and Recycling Management Sub-Plan – Systems Connect

This HSEP has been developed in accordance with the following relevant guidelines and legislation:

- Work Health and Safety Act 2011;
- Work Health and Safety Regulations 2017;
- Code of Practice: How to Safely Remove Asbestos;
- Protection of the Environment Operations Act 1997 (PEOE Act); and
- NSW Heritage Act 1977 (Heritage Act)



## 2 Site Investigation Details

**Table 2.1: Site Investigation Details**

Site Investigation Details	
Activity description	<ol style="list-style-type: none"> <li>1. General site investigation activities: Drive to/from Chatswood, site inspection, service locating, service clearances,</li> <li>2. Groundwater investigation activities: Groundwater well purging and development, groundwater sampling,</li> <li>3. Asbestos in soils investigation activities: Test pit digging, including surface slab concrete cutting, soil sampling .</li> </ol>
Date and time	28/08/23 – 29/09/23 (approximate). All works will be completed within standard construction hours (0700-1800) Monday to Friday.
Lead Contractor	Nation Partners
Subcontractors	Service locator – To be determined Concrete cutting, testpitting, and asbestos air monitoring – Synergy
Site Investigation Supervisor	Bradley Coates / Nelson Phillips
Location/s	Chatswood Site - corner of Pacific Highway and Mowbray Road, Chatswood, NSW 2067
Nation Partners travel requirements	Travel will be to and from site by car. Work will generally commence no earlier than 0700 and be complete no later than 1800.
Induction process	One initial site induction by the Sydney Metro/Systems Connect contractor. Then one project specific induction performed by Nation Partners for Nation Partners staff and sub-contractors.
PPE	<p>Hard hat, long sleeve shirt and pants, hi-vis vest or shirt, steel cap boots, safety glasses, gloves. P2 masks and hearing protection will be provided if required.</p> <p>Hearing protection only required when working within 10 m of operational plant.</p> <p>Nitrile gloves to be used when collecting samples. Hardwearing gloves to be used for any manual tasks.</p> <p>PPE requirements for subcontractor works are detailed in subcontractor SWMS, to be provided. Where Nation Partners personnel approach or are otherwise involved in sub-contractor works, all PPE requirements of the sub-contractor SWMS will also be implemented.</p>

**Table 2.2: Site Investigation Scope, Delivery Personnel, Location, and Safety Documents**

Scope	Delivery Personnel, Safety Documentation and Work Dates	Location
<ul style="list-style-type: none"> <li>• Development of an SAQP.</li> </ul>	<u>Nation Partners</u>	Nation Partners Office - Suite 306, 50 Holt Street Surry Hills, NSW 2010
<ul style="list-style-type: none"> <li>• Prepare a HSEP.</li> </ul>	See SWMS: Appendix B	



Scope	Delivery Personnel, Safety Documentation and Work Dates	Location
<ul style="list-style-type: none"> <li>Develop a Safe Works Method Statement (SWMS).</li> <li>Undertake site works to collect additional environmental data.</li> <li>Collate and interpret environmental data and prepare Pre-Remediation Investigation report.</li> <li>Attend a meeting with Sydney Metro and the Site Auditor to discuss the outcomes of the site investigation.</li> <li>Finalise the site investigation report and deliver to Sydney Metro and the Site Auditor.</li> </ul>	<p>Days on site: 5            Dates: 14 September 2023            Activities: Groundwater well purging and developing, groundwater sampling, soil sampling            Plant / equipment: Dip meter, water quality meter, low flow sampling kit/bladder pump kit, tools and consumables.            Contact Name and Number:            Bradley Coates 0404 236 106            Nelson Phillips 0400 734 125            Ryan Thomson 0430 094 241</p> <p><u>Nation Partners and Subcontractors</u>            See SWMS: Appendix B, Appendix C and Appendix D.            Days on site: Approx 14 Days            Dates: Commencing 18 September 2023            Activities: Service locating, service clearances, concrete cutting, test pit digging            Plant / equipment: Service clearing equipment, excavator, concrete saw, bobcat, hand tools and consumables            Contact Name and Number:            Bradley Coates 0404 236 106            Nelson Phillips. 0400 734 125            Ryan Thomson 0430 094 241</p>	<p>Chatswood Site - corner of Pacific Highway and Mowbray Road, Chatswood, NSW 2067</p>

## 3 Responsibilities

### 3.1 Roles and accountabilities

The site investigation works will be delivered by Nation Partners and their sub-contractors. Staff of both Nation Partners and sub-contractors will be responsible for the management and implementation of safe work practices on this project.

**Table 3.1: Roles and Accountabilities**

Role/s	Name/s	Accountabilities
Project Director	Liam Gooley	Approval of safety documentation
Project Manger	Bradley Coates	Approval of safety documentation
Site Investigation Supervisor / Site Works Manager	Bradley Coates Nelson Phillips Ryan Thomson	Review of sub-contractor SWMS Supervision of sub-contractors Toolbox talks Adherence to safety directions of Synergy Excavation Supervisor
Sub-Contractors	Service locator subcontractor –TBD	Provision of SWMS Adherence to SWMs and this HSEP Adherence to safety directions of Site Investigation Supervisor
	Synergy Resource Management	Adherence to SWMS and this HSEP Adherence to safety directions of Site Investigation Supervisor Synergy will manage risks related to asbestos in soils. <b>See Synergy's Asbestos Works Plan</b> in Appendix D. Supervision of sub-contractors (within excavation areas) Toolbox talks (during test pitting works)

### 3.2 Chain of Responsibility

As Systems Connect are the current site occupier, Nation Partners and all sub-contractors will carry out all work in-line with the Systems Connect CEMP and sub-plans.

During the investigation activities described in **Table 2.1** as (1) General site investigation activities and (2) Groundwater investigation activities sub-contractors will work under Nation Partners' HSEP and SWMS.

During the asbestos in soils investigation activities activity described in **Table 2.1** as (3) Asbestos in soils investigation activities, Nation Partners will work under the controls implemented by Synergy, detailed in **Appendix D**.

### 3.3 Systems Connect Activities and Demolition Works

System Connect is currently completing various site tasks, such as installation of stormwater infrastructure in the northeast portion of site and associated landscaping. Systems Connect will also be utilising a demolition sub-contractor to demolish various buildings including the former Ausgrid building in the central portion of site and the logistical shed located to the northwest of site. These activities will require logistical considerations to ensure that Nation Partners sampling works do not interfere with the Systems Connect and demolition works. Nation Partners will provide an iterative plan for their works a week in advance for Systems



Connect and the demolition contractor to review. Where required Nation Partners can generally plan around the movements of other site activities.

Nation Partners will provide a representative to attend the daily site wide Systems Connect kick-off meeting prior to works to help coordinate the planned works and work areas for that day.

The testpitting sampling areas will be demarcated via fencing associated with Synergy's asbestos controls, see **Appendix D** – Synergy Asbestos Works Plan. These fenced off work areas will be discussed with the Systemes Connect site manager prior to setup and will act as a physical boundary to minimise interactions between Nation Partners / Synergy staff and Systems Connect / demolition contractors.

## 4 Training and Competency

### 4.1 Site Induction

It is understood that Sydney Metro contractor, Systems Connect, will induct Nation Partners and sub-contractors to the site. A Nation Partners representative will induct all sub-contractors and visitors to Nation Partners' work area to this HSEP, ensure their understanding and require sign-on to the document.

Nation Partners will ensure that one appropriately qualified environmental advisor supervises the investigation works conducted by all sub-contractors. All sub-contractors will be required to provide a SWMS prior to commencement of the site investigation works.

The competence of workers carrying out any work involving the operation of powered mobile plant (including excavator or tipper) will be verified prior to the commencement of any works.

### 4.2 Railway Industry Worker (RIW) Requirements

A RIW card is required to undertake site investigation works on the site as advised by Sydney Metro. Nation Partners will ensure all team members undertaking field works and all sub-contractors have a valid RIW card for the site investigation works.

A register is provided in **Appendix E** which will document RIW card numbers of all personnel including sub-contractors.

### 4.3 Staff Competency

Nation Partners will ensure that an appropriately qualified environmental consultant conducts the site investigation works during the environmental site investigation.

### 4.4 Sub-Contractor Competency

All sub-contractors will be required to provide a SWMS prior to the site investigation works, which will be reviewed by Nation Partners.

The competence of workers carrying out any work involving the operation of powered mobile plant (excavator and tipper) will be verified prior to the commencement of any works.

The competence of service locators has been confirmed via the BYDA process and will be verified on-site prior to the start of works (see SWMS **Appendix B**).

### 4.5 Certifications and Insurances

Nation Partners will obtain relevant sub-contractor insurances and certifications prior to the commencement of site works.

### 4.6 Sub-Contractor Plant and Machinery

It is the responsibility of the sub-contractor to ensure that all mobile plant operating on-site will be safe for use, fit for purpose and licensed or registered as required.

## 5 Consultation and Communication

The following forms of safety communication and consultation will be utilised throughout the site investigation works so that workers are aware of and understand safety requirements and procedures to be undertaken during the site investigation.

### 5.1 Safe Work Method Statement

Nation Partners will provide Sydney Metro and Systems Connect with a SWMS specific to our tasks prior to the commencement of works, in addition to relevant sub-contractors' SWMS. All workers, including sub-contractors, will sign onto the relevant SWMS prior to the commencement of works.

Completed SWMS will be kept with the Project Manager for the duration of the work.

### 5.2 Take 5

Nation Partners will conduct a 'Take 5' form at the commencement of each workday, to identify any changes or additional hazards and notify colleagues of working arrangements.

Where the Take 5 identifies hazards that are substantially different to the SWMS, the SWMS will be revised and communicated.

### 5.3 Toolbox Talks

A pre-start toolbox talk will be conducted by the Nation Partners for site investigation supervisor with all workers on the site, including sub-contractors, at the commencement of works each day, on days where non-excavation activities are being undertaken (groundwater or service locating related). On work days involving concrete cutting and test pitting, Synergy will conduct the toolbox talk with all workers on the site (including Nation Partners and their own sub-contractors), at the commencement of the works each day.

All workers will sign onto the Toolbox Talk prior to commencing work. Completed Toolbox Talks will be kept with the Project Manager or Synergy Project Manager for the duration of the work. Synergy toolbox talks will be shared with Nation Partners at the conclusion of the project.

### 5.4 Sub-Contractor Safety Documentation

All sub-contractors will communicate their SWMS prior to commencing work. Nation Partners will review sub-contractor SWMS and check for appropriateness. A copy of all sub-contractors SWMS are available in **Appendix C (Locators TBD)** and **Appendix D (Synergy)**, and will be provided to Sydney Metro and Systems Connect prior to commencement of works.

## 6 Hazards and Identification Controls

Nation Partners has conducted a desktop risk assessment to inform identified safety and environment hazards and controls associated with the data gaps investigation works. The details of the assessment have been provided in the SWMS in **Appendix B**.

The primary hazards and associated controls have been outlined in **Table 6.1** and **Table 6.2**. These hazards along with less severe hazards are also addressed in the SWMS. Nation Partners staff and associated subcontractors will also be informed by the Systems Connect Environmental Management Systems in Particular, staff will be made known of the site environmental controls as provided in **Appendix A - Figure 1. Chatswood Dive Site Environmental Controls**. Asbestos and hazards associated with concrete cutting and testpitting will be controlled through measures detailed in the Synergy work plan (**Appendix D**).

**Table 6.1: Health, Safety and Hazards Controls**

Primary Hazard	Controls
Contact with above or below ground services	<p>Elimination – Obtain underground service plans prior to excavation works. Validate the presence of electrical infrastructure via a qualified service locator. Abide by safe working distances. Assume that all cables are live until proven otherwise.</p> <p>Substitution – If underground or above ground services exist, conduct testpitting works in an alternative location.</p> <p>Isolation &amp; Engineering Controls – Clearly mark underground services and where possible, use physical barriers or fences to isolate both above and below ground services. Once the slab is removed material will be removed via the excavator at a rate of 0.1 m at a time using a toothless bucket (such as a mud bucket). A spotter will monitor for services to a depth of 1.5 m (or until natural, undisturbed ground is confirmed with minimum 1.0 m using this methodology).</p> <p>Administrative – Identify potential hazards, conduct a Take 5, toolbox talks, and inductions. Clearly mark and record location of services following service checks for future reference. Ensure accreditation of locator prior to start of works and record on SWMS.</p> <p>PPE – Wear appropriate PPE when conducting service checks and site work including steel cap boots, hard hat, high-vis long sleeve shirt and pants, and when necessary, gloves and safety glasses.</p> <p>A copy of the Nation Partners Service Clearances Standard Operating Procedure is provided in Appendix F</p>
Work near mobile plant or vehicle (operated by other sites users or sub-contractors)	<p>Elimination – Minimise number of employees and time spent working near a mobile plant or vehicle.</p> <p>Substitution – Consult with construction contractors to encourage the selection of equipment with lower risk profiles.</p> <p>Isolation – Arrange working areas to facilitate separation (distance) between staff and use of mobile plant or vehicle, including minimising duration of work. Ensure work area of staff is &gt;3 m beyond maximum reach of machinery.</p> <p>Engineering Controls – Where possible, use physical barriers / fencing to separate people from use of mobile plant or vehicle. Ensure required guarding is properly fitted and that emergency stops are operational (to be tested before use). Where practical place vehicle between work area and plant.</p> <p>Administrative – Identify potential hazards, conduct a Take 5, toolbox talk, and an induction to address safe work near mobile plant or vehicle. Establish clear communication and approach protocols with plant/vehicle operators, ensure they are appropriately trained, and hold required certificates of competency. Do not approach moving plant &amp; ensure positive communication of intent before approaching to undertake sampling.</p> <p>PPE – Adopt minimum standards of PPE including steel capped boots, high visibility vest, hard hat, long pants and long sleeves to mitigate impacts associated with working around plant. Safety glasses and gloves are available for staff.</p>
Work near excavations	<p>Elimination – Do not access the areas around excavations unless it is necessary and do not go closer than 1 m of the edge of excavations. Do not enter any excavation greater than waist deep unless support systems are in place. Plan work tasks to minimise the time spent working near excavations. Ensure that construction contractors have identified and isolated / protected all underground services prior to excavation.</p> <p>Substitution – Encourage construction contractors to perform excavation via mechanical means rather than hand digging.</p>



Primary Hazard	Controls
	<p>Engineering Controls – Ensure that construction contractors use techniques such as benching, battering or shoring of excavations to prevent collapse. Encourage consultation with geotechnical engineers and with structural engineers (if structures are present) to ensure appropriate design of these controls. Encourage the temporary stabilisation of excavation walls during adverse weather, and encourage backfilling of excavations as quickly as possible.</p> <p>Administrative – Identify potential hazards, develop JSEAs, conduct a Take 5, toolbox talk, and an induction to communicate with other workers regarding excavations.</p> <p>PPE – Adopt the minimum PPE requirements for construction sites.</p>
<p>Contact with contaminated soil, water or air</p>	<p>Elimination – Do not enter any contaminated site if risks associated with exposure to contaminated soil or water cannot be adequately controlled.</p> <p>Isolation – Avoid contact with all equipment that has been in contact with potentially contaminated materials. Where contact is necessary, ensure appropriate PPE is worn at all times. Decontaminate equipment at the earliest appropriate opportunity via the use of high-pressure washer and Decon 90 (or PFAS sampling friendly detergent). Decontamination washing will occur over a purpose-built decontamination unit or with purpose specific equipment. Do not touch face or exposed skin and wash down any exposed skin with soap/disinfectant immediately.</p> <p>Administrative – Identify potential hazards, conduct a Take 5, toolbox talk, and an induction to communicate any potential risks.</p> <p>PPE – Use appropriate PPE, as determined through the desktop review of contamination issues to protect workers from exposure to contamination. In this instance minimum PPE is nitrile gloves, long sleeve shirt and pants, safety boots, hi vis vest, helmet, sampling gloves and P2 masks when in proximity or when sampling (if deemed appropriate by field personnel).</p>
<p>Contact with airborne asbestos</p>	<p>Elimination – Removing non-friable asbestos if licensed, do not use high pressure water sprays, compressed air, brooms or anything else that might release asbestos into the air. Minimise dust during work activities.</p> <p>Isolation – Do not approach site while construction works are occurring and asbestos has been identified, enclose, encapsulate and/or seal asbestos if possible. Use fencing/barricades and/or labels or warning signs to stop public from approaching the area. Use machinery with enclosed cabins.</p> <p>Engineering Controls – Avoid work during dry or windy conditions, particularly if wind direction is towards public areas. Implement wet construction method if large amounts of dust are created on site.</p> <p>Administrative – Identify hazards and record them on register. Develop SWMS, conduct Take 5, Toolbox talk and induction work to communicate to other workers about asbestos and dust work methods and procedures to minimise exposure. Collect samples of ACM for the purpose of analysis. Position personnel away from dust generating activity by establishing exclusion zones. Works to be undertaken by Class A licenced subcontractor. Undertake asbestos air monitoring during the works with daily clearance reports.</p> <p>PPE – Personnel should be wearing respirators, eye protection, long sleeves, long pants and safety boots at all times. Tyvek coveralls should be worn during sampling works and when in contact with soils.</p>
<p>Sub-contractor works and services</p>	<p>Elimination – Non-critical investigation works will be avoided/eliminated wherever an increased safety risk arises.</p> <p>Isolation – Do not approach any specialist sub-contracting service provider (or the associated workspace) without positively communicating your intention to approach and receiving an unambiguous response that it is safe to do so.</p> <p>Engineering Controls – Ensure that contractors implement engineering controls in accordance with their SWMS and in accordance with safety controls outlined in Nation Partners SWMS.</p> <p>Administrative – Ensure all subcontractors are experienced and appropriately qualified to deliver the scope of works. Reassess risks regularly and at the toolbox talks. Review subcontractor SWMS and supervise regularly to ensure strict compliance with controls.</p> <p>PPE – Ensure all subcontractors utilise PPE in accordance with SWMS.</p>
<p>Heavy Vehicle National Law (HVNL) / Chain of responsibility</p>	<p>Substitution – Use plant and machinery right for size, where possible do not use heavy vehicles. It is noted that long drives are unnecessary for this project reducing risks, particularly fatigue.</p> <p>Administrative – Ensure all subcontractors operating heavy vehicles have appropriate plans in place to manage compliance with HVNL, including: Speed; Fatigue; Mass; Dimensions; Load Restraint and Vehicle Standards/ Roadworthiness. Review, monitor and communicate potential risks and any required updates due to changes via a Take 5, toolbox talk, and an induction.</p>



**Table 6.2: Environmental Hazards and Controls**

Primary Hazard	Controls
Dust/Asbestos	<p>Elimination – Implement dust <b>suppression techniques 'if required' (eg. Watercart), avoid the formation of dust plumes</b> from site works and stick to established access routes where possible. Undertake service locating and identify areas of potential asbestos exposure.</p> <p>Administrative – Review weather forecast for potential high winds. Conduct a Take 5, toolbox talk, and an <b>induction to communicate any potential risks. Ensure asbestos are not present but 'if present' manage these</b> appropriately. Work in areas of asbestos exposure with caution, if high levels of asbestos are present, ensure all appropriate PPE is adhered to.</p>
Erosion and sediment	<p>Elimination – Minimise ground disturbance and removal of ground cover.</p> <p>Engineering Controls – <b>Install 'if required' clean water diversion channels/drains</b> and maintain them and drainage and erosion, sediment controls. Remove Erosion and sediment controls once area is stabilised.</p> <p>Administrative - Conduct a Take 5, toolbox talk, and an induction to communicate any erosion and sediment potential risks</p>
Waste Management	<p>Elimination – Waste should be minimised during site works. Work area to be kept tidy and clean.</p> <p>Controls - Nation Partners to establish drums for all waste, temporary storage and will appropriately dispose of these. Classify waste according to EPA waste classification guidelines. Label waste to facilitate recycling and avoid cross-contamination.</p> <p>Administrative - Conduct a Take 5, toolbox talk, and an induction to communicate any potential risks and remind the avoid, reduce, reuse and recycle principles. Keep waste classification documentation for appropriate disposal.</p>
Unexpected Heritage	<p>Controls – Stop works immediately, restrict access and contact Sydney Metro.</p> <p>Engineering Controls – Use appropriate fencing and signage to restrict access and minimise impacts to heritage values.</p> <p>Administrative – Follow the Sydney Metro Aboriginal and Historic Heritage Management Procedure and Sydney Metro Unexpected Heritage Finds Procedure (included as Appendix G), Conduct a Take 5, toolbox talk, and an induction to communicate any potential risks</p>



## 7 Incident Notification

### 7.1 Incident Report Procedure

The following steps outline the basic incident reporting procedure to be undertaken should an incident arise during the site investigation:

- Pre-brief / induction to contain information regarding incident notification at Site;
- Call Nation Partners Project Manager (inform cause of the incident) Bradley Coates 0404 236 106;
- Inform the Systems Connect site representative of the incident;
- Fill-out NP Incident Report;
- Fill out Systems Connect Incident Report (with Systems Connect site representative);
- NP WHS representative will investigate the incident including, root cause, analysis and implementation of corrective actions;
- Assist in the investigation of the incident with Systems Connect (if required); and
- Project Manager to inform Sydney Metro of the incident and assist with their internal investigations.

## 8 Emergency Plan

### 8.1 Emergency Response Plan

The following steps outline the basic emergency response procedure to be undertaken should an emergency arise during the site investigation:

- Pre-brief / induction to contain information regarding emergency and /or evacuation plan at the Site;
- Follow instructions in case of emergency; and
- Call 000 for all emergencies.

#### **Assembly Point**

Ensure pre-brief / induction contains information about assembly point at site should an emergency arise.

#### **Location of Vehicle**

Ensure location of staff vehicle is always known.

### 8.2 Emergency Evacuation

Where any person becomes aware of an incident, occurrence or risk that requires an evacuation of the site, that person shall communicate the need directly to the Site Investigation Supervisor.

The Site Investigation Supervisor will communicate with all personnel present on-site as soon as practicable and if necessary, inform them directly of the need to evacuate (face to face or phone call).

The Site Investigation Supervisor will communicate directly with Sydney Metro representatives or other personnel on-site regarding the need to evacuate (face to face or phone call).

The Site Investigation Supervisor will be responsible for ensuring that all personnel associated with the environmental investigation works have evacuated from the site following Sydney Metro evacuation plan.

Once all persons are safe the Site Investigation Supervisor will contact the Project Manager (Bradley Coates).

This process will be communicated to all sub-contractors at the site induction and reiterated at the morning toolbox talks.

### 8.3 First Aid

All Nation Partners staff are first aid qualified. A fully stocked first aid kit will be kept on site with field staff during the site investigation.

## 9 Statement of Limitations & Disclaimer

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# Appendices



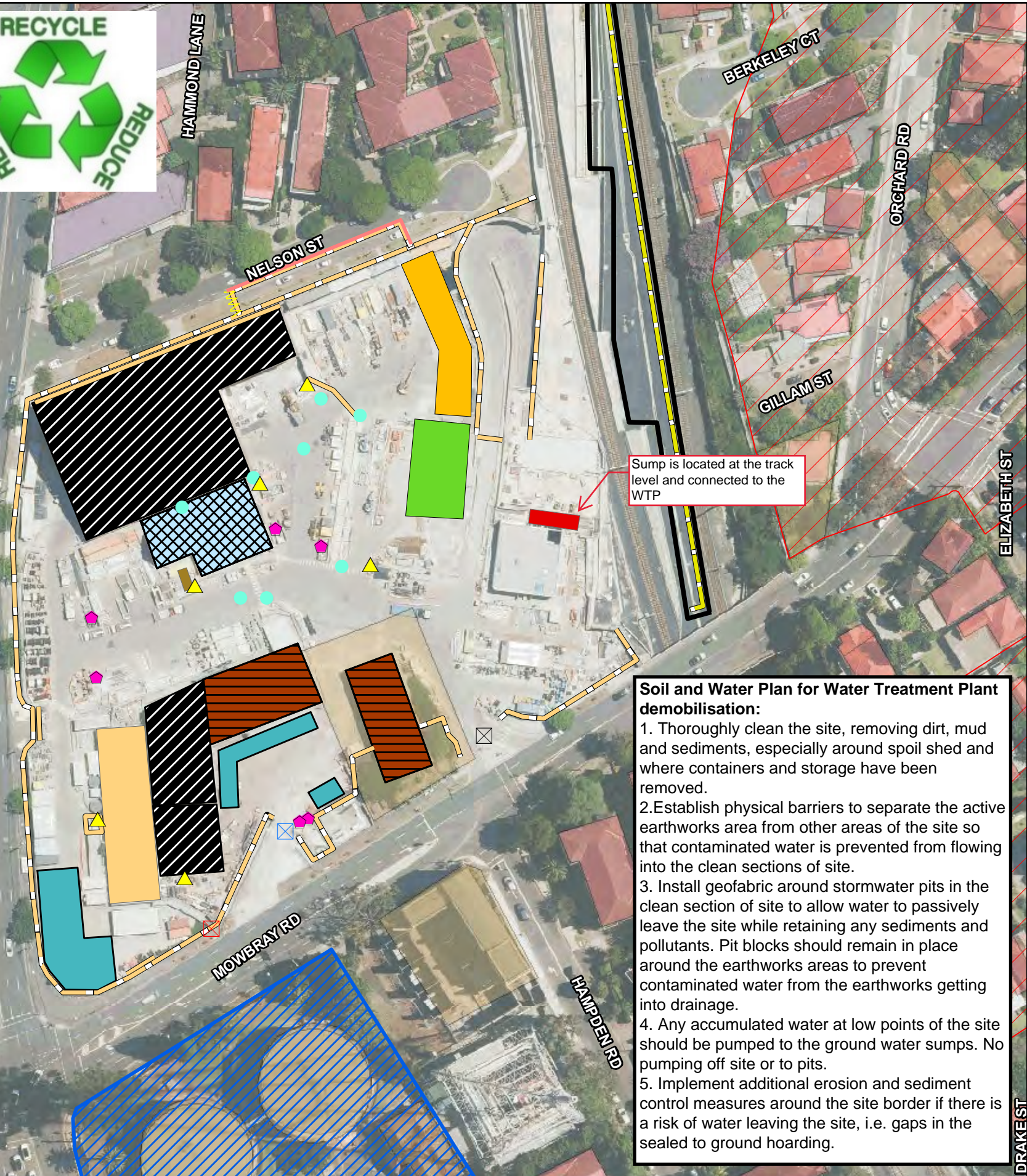
## A Figures

### A1 Figure 1. Systems Connect Site Environment Plan



**SEP Layers**

	Entry - Pedestrian		State Heritage Act
	Entry - Vehicle		Conservation Area - General
	Gate		Item - General
	Skip	<b>Land Use</b>	
	Spill Kit		Commercial
	Stormwater Pit		Hotel/Motel/Hostel
	Bunding		Industrial
	Clean Water Diversion		Place of Worship
	Coir Logs		Recreational - Passive
	Fence - Temporary		Residential
	Noise Wall / Noise Mats		Earthworks Area
	SC Site Boundary		Fire Pump Buildings
	Crib Room		
	Office		
	Parking		
	Refuelling Area		
	Shed		
	Sump		
	Water treatment Plant		



# Chatswood Dive

**Key Environmental Risks and Controls**  
 No work is permitted outside the project boundary or within protected areas  
 Report to Environmental Coordinator:  
 ➤ All incidents, spills and complaints  
 ➤ Any unusual finds (odours, contaminated soil, suspected artifacts)

**SOIL AND WATER:**

- The truck commute areas should be kept clean at all times
- Do not dispose of any substance into any drainage pit or swale
- Water from site must be pumped into the ground water sumps located at track level
- Hazardous substances must be stored correctly, in banded areas, to prevent spills
- Refuel at designated locations only
- Spill kits to be in place in plant operating areas, refueling and chemical storage areas.
- ERSED controls to be installed and maintained as per this SEP
- Stockpiles to be stabilised
- No mud or sediment to be tracked off the site
- Concrete washouts must be used for rinsing concrete trucks, pumps, chutes and other concreting tools & equipment
- Regular sweeper truck is to be used on site
- Clean areas where dirt has accumulated.

**WASTE:**

- Re-use or recycle construction materials wherever possible
- 100% of spoil is to be re-used
- Place all paper & cardboard into recycling bins
- Place all other waste into the appropriate bins
- Do not dispose of waste into any drains
- Mixed construction waste will be sorted off-site for recycling
- All waste leaving the site must be waste classified, tracked and recycled or disposed of at a licenced waste facility

**AIR QUALITY:**

- Dust suppression measures must be used to prevent or minimise dust
- Dust management systems to be in place for demolition works.
- Earthworks to be wetted down to minimise dust
- Sweeper truck to be regularly used on site
- All loads leaving the site must be covered

**NOISE AND VIBRATION:**

- Approved working hours are:
  - 7am - 6pm Monday - Friday and 8am - 6pm Saturdays
  - No work on Sundays or Public Holidays
- No work outside of these hours without specific approval
- Minimise plant & equipment running times. Turn equipment off when not in used.
- Avoid simultaneous use of noisy equipment.
- Non-tonal movement alarms are mandatory.
- High noise impact works only allowed
  - 8am - 5pm Monday - Friday and 8am - 1pm Saturday
  - In blocks not exceeding 3 hrs each with respite of 1 hr between blocks
- Reasonable and feasible noise mitigation to be implemented where required
- Noise blankets to be installed where hoarding has been removed.

**TRAFFIC:**

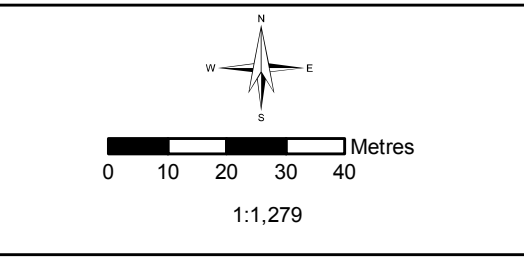
- Park in designated areas and use approved access & truck routes only
  - as per the Approved Vehicle Movement Plan (VMP)
- No heavy vehicle queuing in residential streets before or after hours

**APPROVALS:**

- Works that require specific Environmental Approvals include work outside of standard hours, work outside the project boundary, clearing land or vegetation and discharge of water

**Key Contacts**

Role	Name	Contact Number
Project Manager	Simon Tibbett	0457 761 648
Superintendent	Stephen Bush	0409 186 716
Environment Area Coordinator	Charlotte Carter	0422 788 323
Senior Community Relations Advisor	Hubavina Barbolova	0487 277 746

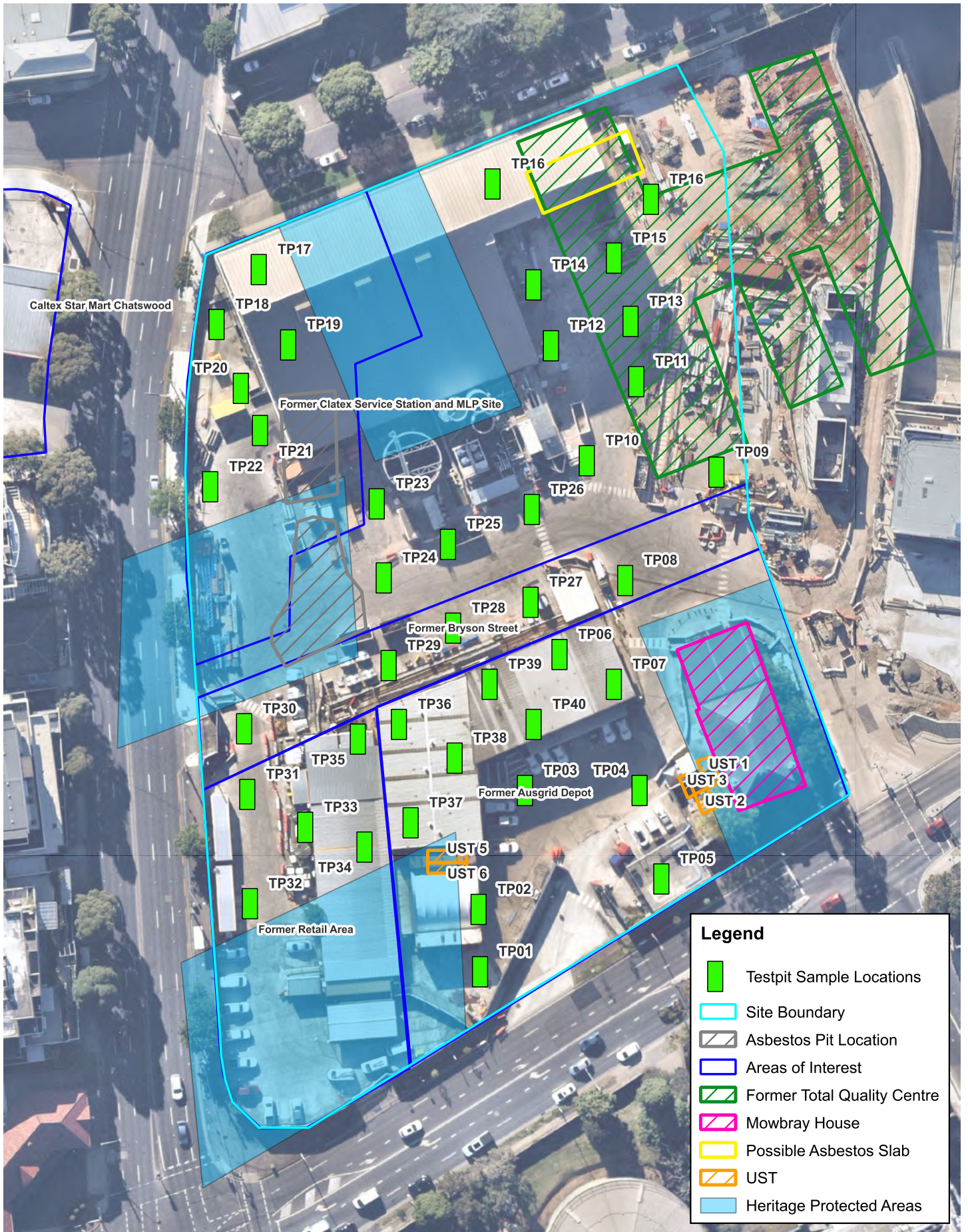


<b>Status</b>			
<b>FOR CONSTRUCTION</b>			
Coordinate System	MGA ZONE 56	Drawn	GIS
Height Datum	AHD	Date Printed	12/07/2023
Created By	Carter, Charlotte		
Filename:	SCLWW_SEP.mxd		



## A2 Figure 2. Sampling Locations and Heritage Protected Areas

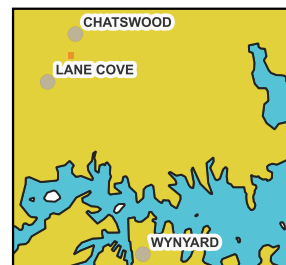




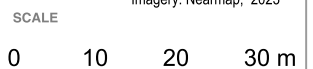
**Figure A: Updated Sampling Locations**

Chatswood Pre-Remediation Investigation  
Sampling Analysis and Quality Plan

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DATA SOURCE  
Imagery: Nearmap, 2023



nation  
partners



## B Site Investigation Nation Partners SWMS

Safe Work Method Statement (SWMS) – Groundwater gauging and sampling		Project Number:	NP22202
<p>NOTE: Work must be performed in accordance with this SWMS.          This SWMS must be kept and be available for inspection until the high risk construction work to which this SWMS relates is completed.          If the SWMS is revised, all versions should be kept.          If a notifiable incident occurs in relation to the high risk construction work in this SWMS, the SWMS must be kept for at least 2 years from the date of the notifiable incident.</p>		Project Name:	Chatswood Metro Remediation Investigation
Personnel		Contact	Site Details
Project Manager:	Bradley Coates	0404 236 106	Site Name: Chatswood Metro Site
Project Director	Liam Gooley	0418 689 493	Site Address: Corner of Pacific Highway and Mowbray Road, Chatswood, NSW 2067
Project Field Staff:	Bradley Coates Nelson Phillips Ryan Thomson	0404 236 106 0400 734 125 0430 094 241	Types of Facilities: Facilities such as toilets and water are available on site in Mowbray House
Sub-Contractors:	None		Nearest Hospital: Royal North Shore Hospital Reserve Road, St Leonards, Approx travel time from site: 6 mins
			Address: Reserve Rd, St Leonards, NSW 2065
			Contact Number: (02) 9926 7111
Project Details			
Project Services & Scope of Work:	Drive to/from Chatswood site, site inspection, purge, redevelop and monitor groundwater wells		
Plant / Equipment	Dip meter, water quality meter, low flow sampling equipment, tools and consumables.	PPE Requirements	<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Steel toe boots <input checked="" type="checkbox"/> Eye Protection <input checked="" type="checkbox"/> Hi-Vis Clothing
First Aid Trained Personnel	Bradley Coates, Nelson Phillips, Ryan Thomson		
Site Induction	SystemsConnect Induction/Sydney Metro induction Nation Partners HSEP induction		<input checked="" type="checkbox"/> Hearing Protection
Communication Arrangements	Communicate with someone in office upon arriving and leaving site. PM (Brad) when they are not on site, and PD (Liam) when PM is on site.		

Safe Work Method Statement (SWMS) – Groundwater gauging and sampling				Project Number:	NP22202
Approval and Compliance				SWMS Review Date	05/09/2023
Person responsible for ensuring documentation and compliance with SWMS:	Ryan Thomson	Measures to ensure compliance with the SWMS:	Completion of Take 5	Reviewers Name	Liam Gooley
				Signature	

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

- a) Administer first aid and contact emergency services.
- b) Dial 000 for all emergencies
- c) Make the immediate area safe where practical to do so.
- d) Notify the Client representative and Project Manager.
- e) The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team and re-evaluation of the hazard and the level of protection required.

Legal & Contractual Requirements

Work Health and Safety Act 2011  
 Work Health and Safety Regulation 2011  
 Protection of the Environment Operations Act 1997 (NSW)  
 Code of practice: How to Safely Remove Asbestos  
 NSW Heritage Act 1977 (Heritage Act)

\*\* I, the undersigned, understand the requirements of this SWMS and my responsibilities to be proactive in assessing the actual risks associated with my activities and adopt appropriate measures to manage all perceived risks, not just those documented in the SWMS.

Name	Organisation	Date	Signature
Bradley Coates	Nation Partners		
Nelson Phillips	Nation Partners		
Ryan Thomson	Nation Partners		

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

NOTE: Work must be performed in accordance with this SWMS.

This SWMS must be kept and be available for inspection until the high risk construction work to which this SWMS relates is completed.

If the SWMS is revised, all versions should be kept.

If a notifiable incident occurs in relation to the high risk construction work in this SWMS, the SWMS must be kept for at least 2 years from the date of the notifiable incident.

Safety Hazards, Risk & Controls

What are the tasks involved?	What are the hazards and risks?	What are the controls measures?	What is the residual risk rating?
Travel to / from site by car	Car accident Road rage	Elimination – As a minimum, abide by all road laws and traffic signals (including at pedestrian crossings) and be courteous to other road users. Substitution – Long drives are unnecessary for this task.	Moderate
Walking on site	Slips, trips and falls	Elimination – Drive instead of walking and stay on access paths as much as possible. Avoid uneven or slippery ground. Substitution – Plan work to minimise the number of tasks and time spent on uneven or slippery ground. Isolation & Engineering Controls – Do not leave materials (including cables or sampling equipment) on the ground in trafficable areas. Where appropriate, improve the condition of ground surfaces to mitigate the risk e.g. removing moisture, closing wells, removing obstacles. Administrative – Use inductions and toolbox talks to discuss these risks. Take 5 on-site to review site specific risks. PPE – Wear footwear that is appropriate to the work location and provides sufficient protection and support. Wear hi-visibility clothing.	Low
Extreme weather conditions	Working outdoor, exposure to wind, rain, sun etc.	Elimination – Minimise time spent working in outdoor environments and the number of staff performing the work when possible (subject to other relevant hazards). Consider ceasing works in the case of extreme weather conditions with potential to create unsafe working conditions, e.g. extreme wind, rain or heat. Substitution – Consider finding an alternative time to complete work if extreme weather conditions present. Isolation & Engineering Controls – Take regular breaks in shaded areas or within vehicles to minimise exposure to extreme conditions, and ensure appropriate training and awareness. Administrative – Identify potential hazards and check weather forecast, and complete a Take 5, inductions and toolbox talks to discuss the risks associated with weather exposure.	Low

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

		PPE – When working in outdoor environments, cover skin with long clothing whenever possible, ensure adequate exposure protection, taking into consideration the PPE requirements for other site hazards.	
Fire or natural disaster	Explosion, natural fire	<p>Elimination – Follow the advice of fire authorities in all cases, including requests for evacuation. Do not store excessive amounts of flammable materials in our offices or project sites, and consult with site owners to ensure appropriate management of vegetation to minimise the risk of fires.</p> <p>Isolation – Ensure emergency plans identify safe meeting points for staff during evacuations.</p> <p>Engineering Controls – Ensure our offices meet appropriate standards for fire protection. Maintain fire extinguishers on site.</p> <p>Administrative – Maintain emergency plans to assist in safe evacuation of offices in the case of fire, provide regular training updates, reminders, and signage to inform <b>staff of safety and evacuation procedures</b>. Check <b>“FIRES NEAR ME” website on fieldworks day</b> where there is a risk of fire (warm, windy, dry days). Plan work accordingly.</p>	Moderate
Opening well heads	Cuts and abrasions, Spiders and insects under well cover, Pressure and odour/vapour release, Airborne contaminants, Exposure to contaminants	<p>Engineering Controls - Hand tools must be fit for purpose and used for their intended purpose in accordance with manufacturer instructions. Well head cover security bolts must only be removed using a Gatic Key (or other tool to fit security bolt design). Use Gatic Lifter for large well head covers – do not use hammers, screw drivers or other tools. Use tubing cutter, shears or secateurs to cut tubing – open bladed knives must not be used. Remove well cover carefully. Check well for spiders and insects prior to sampling – clear spider webs and accumulated debris using a stick or tool. Where volatile contaminants are suspected, utilize a photo-ionisation detector to conduct monitoring of ambient air as indicated by the HaSEP <b>Monitoring to be continuous in the operator’s breathing zone and immediate area surrounding the sampling location.</b></p> <p>Isolation - Hand tools must be visually inspected for serviceability daily - defective tools must be removed from service immediately. Keep operator breathing zone away from well - do not place your face directly over the well head to prevent inhalation. Allow odours/vapours to dissipate after opening the well head.</p> <p>Administrative - Ensure that cutting tools are actively maintained, including regular changing of blades, cleaning away any built up material and ensuring that safety housing is functional. Ensure there are first aid trained workers and a first aid kit available on site. Ensure good hygiene - wash hands and exposed skin before eating, drinking, smoking and completing work for the day.</p> <p>PPE – Use Cut 1 gloves when removing well covers. Ensure respiratory protection, appropriate to the contaminant, is accessible at all times and donned if airborne contaminants are known or suspected. Don half face respirator if airborne contaminants are expected or detected. Wear nitrile or neoprene gloves during sampling.</p> <p>Substitution - Caution should be undertaken when accessing/opening well covers for well casing pressure and odour/vapour generation. Avoid exposure by positioning upwind of well head.</p>	Moderate
Contact with contaminated soil or water.	Poor decontamination procedures, inappropriate work methods, lack of PPE	<p>Elimination – Do not enter any contaminated site if risks associated with exposure to contaminated soil cannot be adequately controlled.</p> <p>Isolation – Do not approach wells or dirty equipment unless absolutely necessary. Avoid contact with all equipment that has been in contact with potentially contaminated materials. Where contact is necessary, ensure appropriate PPE is worn at all times. Decontaminate equipment at the earliest appropriate opportunity via the use of water and detergent solution. Do not touch face or exposed skin and wash down any exposed skin with soap/disinfectant immediately.</p> <p>Administrative – Identify potential hazards, conduct a Take 5, toolbox talk, and an induction to communicate any potential risks.</p>	Low

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

		PPE – Use appropriate PPE, as determined through the desktop review of contamination issues to protect workers from exposure to contamination. In this instance minimum PPE is long sleeve shirt and pants, safety boots, hi vis vest and sampling gloves.	
Exposure to sample preservatives	Chemical burns and vapour inhalation	Engineering Controls - Take care when filling sampling bottles and do not overfill bottles which contain chemical preservatives. Never assume sample bottle caps are firmly fastened in particular those containing preservatives. Administrative - Check for signs of preservatives no exterior of sample bottles. Ensure SDS is available and that preservatives are transported, used and stored in accordance with SDS. PPE - Wear nitrile or neoprene gloves during sampling where hydrocarbons are expected. Long sleeve shirts and long trousers covering skin. Safety glasses to worn at all times when testing. Elimination - In the event of exposure, remove contaminated clothing, flush area with fresh water and seek first aid.	Low
Use of hand-held plant / equipment	Overuse injury from manual labour using hand-held plant/equipment	Elimination – Minimise time spent using hand held equipment. Minimise manual handling through safe lifting techniques and use of manual labour aids. Administrative – Review instruction manuals to ensure familiarity with proper methods of use and posture to limit repetitive injuries to hands/arms and back. PPE – Adopt minimum standards of PPE for appropriate type of work / equipment used. Gloves available for works.	Low

Environment Hazards, Risks & Controls

What are the tasks involved?	What are the hazards and risks?	What are the controls measures?	What is the residual risk rating?
Site works cause pollution from waste	Contamination of environmental receptors Non-compliance with regulations	Elimination – Waste should be minimise during site works. Work area to be kept tidy and clean Engineering Controls - Nation Partners to establish drums or intermediate bulk containers for all waste, temporary storage and will appropriately dispose of these. Classify waste according to EPA waste classification guidelines. Label waste to facilitate recycling and avoid cross-contamination Administrative - Conduct a Take 5, toolbox talk, and an induction to communicate any potential risks and remind the avoid, reduce, reuse and recycle principles. Keep waste classification documentation for appropriate disposal.	Moderate
Opening well heads	Items falling down monitoring well	Elimination - Remove objects from top pockets or fasten pockets. Avoid holding unrestrained equipment or objects near the well head.	Low

Emergency Response

To be determined by Sydney Metro and SystemsConnect induction. Assess site specific risks and emergency responses upon arrival. Designate a muster point. Project team to stay together at all times during the site inspection.  
Bradley, Nelson and Ryan to communicate with each other and Liam as required.

SWMS Approval				
Version	Date	Notes / Changes	Author Name	Approver Name
1.0	05 September 2023		R. Thomson	L Gooley

### Nation Partners Risk Matrix

							Likelihood				
							Occurs often	Likely to occur	Could occur but more than likely it wont	May occur only unusual circumstances	Would only occur under exceptional circumstances
Consequence							Almost Certain	Likely	Possible	Unlikely	Rare
Health & Safety	Environment	Financial	Legal	Service Delivery	Stakeholder						
Several deaths	Irreversible large-scale environmental damage	Direct cost or lost opportunity >\$1M	Prosecution resulting in imprisonment	Complete and irreparable loss in ability to deliver services	Stakeholder outrage, with widespread irreparable damage to reputation	Extreme	Very High	Very High	High	High	Moderate
One death	Long term, moderate-scale environmental damage	Direct cost or lost opportunity \$100k - \$1M	Significant non-compliance resulting in litigation / substantial financial loss	Severa loss in ability to deliver services, but recoverable at high cost and substantial effort	Major stakeholder concern, with widespread, recoverable damage to reputation	Major	Very High	High	High	Moderate	Moderate
Serious injury requiring professional medical treatment	Medium term, small scale environmental damage	Direct cost or lost opportunity \$10k - \$100K	Significant non-compliance resulting in substantial financial loss	Moderate loss in ability to deliver services, with substantial effort to recover	Stakeholder concern with irreparable impact on relationship	Moderate	High	High	Moderate	Moderate	Low
Injury requiring first aid treatment	Short-term, isolated environmental damage	Direct cost or lost opportunity \$1k - \$10k	Non-compliance resulting in a minor financial loss	Minor loss in ability to deliver services, with little effort to recover	Stakeholder disappointment, with reasonable impact on relationship	Minor	High	High	Moderate	Low	Low
Minor injury requiring no active treatment	Minor change from baseline environmental condition	Direct cost or lost opportunity <\$1k	Minor non-compliance with a regulatory or contractual obligation with no impact	Minor change from normal operating conditions	Stakeholder unease, with minor impact on relationship	Insignificant	Moderate	Moderate	Low	Low	Low



Safe Work Method Statement (SWMS) – Test Pitting (including asbestos investigation)		Project Number:	NP22202
NOTE: Work must be performed in accordance with this SWMS. This SWMS must be kept and be available for inspection until the high risk construction work to which this SWMS relates is completed. If the SWMS is revised, all versions should be kept. If a notifiable incident occurs in relation to the high risk construction work in this SWMS, the SWMS must be kept for at least 2 years from the date of the notifiable incident.		Project Name:	Chatswood Metro Remediation Investigation
Personnel		Contact	Site Details
Project Manager:	Bradley Coates	0404 236 106	Site Name: Chatswood Metro Site
Project Director	Liam Gooley	0418 689 493	Site Address: Corner of Pacific Highway and Mowbray Road, Chatswood, NSW 2067
Project Field Staff:	Bradley Coates Nelson Phillips Ryan Thomson	0404 236 106 0400 734 125 0430 094 241	Types of Facilities: Facilities such as toilets and water are available on site at Mowbray House
Sub-Contractors:	Synergy		Nearest Hospital: Royal North Shore Hospital Reserve Road, St Leonards, Approx travel time from site: 6 mins
			Address: Reserve Rd, St Leonards, NSW 2065
			Contact Number: (02) 9926 7111
Project Details			
Project Services & Scope of Work:	Drive to/from Chatswood site, site inspection, service locating and clearances, concrete cutting, concrete breaking and stockpiling, test pitting, soil sampling		
Plant / Equipment	Service locating equipment, PID, concrete saw, excavator, tipper, tools and consumables.	PPE Requirements	<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Steel toe boots <input checked="" type="checkbox"/> Eye Protection <input checked="" type="checkbox"/> Hi-Vis Clothing
First Aid Trained Personnel	Bradley Coates, Nelson Phillips, Ryan Thomson		
Site Induction	SystemsConnect Induction/Sydney Metro induction Nation Partners HSEP induction		<input checked="" type="checkbox"/> Hearing Protection
Communication Arrangements	Communicate with someone in office upon arriving and leaving site. PM (Brad) when they are not on site, and PD (Liam) when PM is on site.		

Safe Work Method Statement (SWMS) – Test Pitting (including asbestos investigation)				Project Number:	NP22202
Approval and Compliance				SWMS Review Date	05/09/2023
Person responsible for ensuring documentation and compliance with SWMS:	Ryan Thomson	Measures to ensure compliance with the SWMS:	Completion of Take 5	Reviewers Name	Liam Gooley
				Signature	

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

- a) Administer first aid and contact emergency services.
- b) Dial 000 for all emergencies
- c) Make the immediate area safe where practical to do so.
- d) Notify the Client representative and Project Manager.
- e) The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team and re-evaluation of the hazard and the level of protection required.

Legal & Contractual Requirements

Work Health and Safety Act 2011  
 Work Health and Safety Regulation 2011  
 Protection of the Environment Operations Act 1997 (NSW)  
 Code of practice: How to Safely Remove Asbestos  
 NSW Heritage Act 1977 (Heritage Act)

\*\* I, the undersigned, understand the requirements of this SWMS and my responsibilities to be proactive in assessing the actual risks associated with my activities and adopt appropriate measures to manage all perceived risks, not just those documented in the SWMS.

Name	Organisation	Date	Signature
Bradley Coates	Nation Partners		
Nelson Phillips	Nation Partners		
Ryan Thomson	Nation Partners		

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

NOTE: Work must be performed in accordance with this SWMS.

This SWMS must be kept and be available for inspection until the high risk construction work to which this SWMS relates is completed.

If the SWMS is revised, all versions should be kept.

If a notifiable incident occurs in relation to the high risk construction work in this SWMS, the SWMS must be kept for at least 2 years from the date of the notifiable incident.

Safety Hazards, Risk & Controls

What are the tasks involved?	What are the hazards and risks?	What are the controls measures?	What is the residual risk rating?
Travel to / from site by car	Car accident Road rage	Elimination – As a minimum, abide by all road laws and traffic signals (including at pedestrian crossings) and be courteous to other road users. Substitution – Long drives are unnecessary for this task.	Moderate
Walking on site	Slips, trips and falls	Elimination – Drive instead of walking and stay on access paths as much as possible. Avoid uneven or slippery ground. Substitution – Plan work to minimise the number of tasks and time spent on uneven or slippery ground. Isolation & Engineering Controls – Do not leave materials (including cables or sampling equipment) on the ground in trafficable areas. Where appropriate, improve the condition of ground surfaces to mitigate the risk e.g. removing moisture, closing wells, removing obstacles. Administrative – Use inductions and toolbox talks to discuss these risks. Take 5 on-site to review site specific risks. PPE – Wear footwear that is appropriate to the work location and provides sufficient protection and support. Wear hi-visibility clothing.	Low
Extreme weather conditions	Working outdoor, exposure to wind, rain, sun etc.	Elimination – Minimise time spent working in outdoor environments and the number of staff performing the work when possible (subject to other relevant hazards). Consider ceasing works in the case of extreme weather conditions with potential to create unsafe working conditions, e.g. extreme wind, rain or heat. Substitution – Consider finding an alternative time to complete work if extreme weather conditions present. Isolation & Engineering Controls – Take regular breaks in shaded areas or within vehicles to minimise exposure to extreme conditions, and ensure appropriate training and awareness. Administrative – Identify potential hazards and check weather forecast, and complete a Take 5, inductions and toolbox talks to discuss the risks associated with weather exposure.	Low

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

		PPE – When working in outdoor environments, cover skin with long clothing whenever possible, ensure adequate exposure protection, taking into consideration the PPE requirements for other site hazards.	
Fire or natural disaster	Explosion, natural fire	<p>Elimination – Follow the advice of fire authorities in all cases, including requests for evacuation. Do not store excessive amounts of flammable materials in our offices or project sites, and consult with site owners to ensure appropriate management of vegetation to minimise the risk of fires.</p> <p>Isolation – Ensure emergency plans identify safe meeting points for staff during evacuations.</p> <p>Engineering Controls – Ensure our offices meet appropriate standards for fire protection. Maintain fire extinguishers on site.</p> <p>Administrative – Maintain emergency plans to assist in safe evacuation of offices in the case of fire, provide regular training updates, <b>reminders, and signage to inform staff of safety and evacuation procedures.</b> Check “FIRES NEAR ME” website on fieldworks day where there is a risk of fire (warm, windy, dry days). Plan work accordingly.</p>	Moderate
Contact with airborne asbestos	Poor understanding of site conditions, inappropriate work methods, lack of PPE	<p>Elimination – Removing non-friable asbestos if licensed, do not use high pressure water sprays, compressed air, brooms or anything else that might release asbestos into the air. Minimise dust during work activities.</p> <p>Isolation – Do not approach site while construction works are occurring and asbestos has been identified, enclose, encapsulate and/or seal asbestos if possible. Use fencing/barricades and/or labels or warning signs to stop public from approaching the area. Use machinery with enclosed cabins.</p> <p>Engineering Controls – Avoid work during dry or windy conditions, particularly if wind direction is towards public areas. Implement wet construction method if large amounts of dust are created on site.</p> <p>Administrative – Identify hazards and record them on register. Develop SWMS, conduct Take5, Toolbox talk and induction work to communicate to other workers about asbestos and dust work methods and procedures to minimise exposure. Collect samples of ACM for the purpose of analysis. Position personnel away from dust generating activity by establishing exclusion zones.</p> <p>PPE – Personnel should be wearing respirators/P2 masks, eye protection, long sleeves, long pants and safety boots at all times. Tyvek coveralls should be worn during sampling works and when in contact with soils.</p>	Moderate
Soil sampling and logging	Contact with contaminated soil or water through poor decontamination procedures, inappropriate work methods, lack of PPE	<p>Elimination – Do not enter any contaminated site if risks associated with exposure to contaminated soil cannot be adequately controlled.</p> <p>Isolation – Do not approach wells or dirty equipment unless absolutely necessary. Avoid contact with all equipment that has been in contact with potentially contaminated materials. Where contact is necessary, ensure appropriate PPE is worn at all times. Decontaminate equipment at the earliest appropriate opportunity via the use of water and detergent solution. Do not touch face or exposed skin and wash down any exposed skin with soap/disinfectant immediately.</p> <p>Administrative – Identify potential hazards, conduct a Take 5, toolbox talk, and an induction to communicate any potential risks.</p> <p>PPE – Use appropriate PPE, as determined through the desktop review of contamination issues to protect workers from exposure to contamination. In this instance minimum PPE is long sleeve shirt and pants, safety boots, hi vis vest and sampling gloves.</p>	Soil sampling and logging
Collection of soil samples below the near surface	Striking underground services, manual handling	Administration - Do not start excavation until clearance activities are completed and location has been verified clear of services. Dial Before You Dig (1100) and other service plans must be available and current at time of excavation. Inspect the site for evidence of unidentified services (i.e. street furniture, pits, pillars and markers) within 100m including clearing leaf litter, mulch, small vegetation and obstructions. Inspect tools before use for condition of handle and security of head. Do not hand excavate below 1.5m.	Moderate

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

		<p>Elimination – Use non-conductive tools around electrical or gas services. Ensure all non-essential personnel are positioned well clear of the operations of tools.</p> <p>Engineering Controls - <b>Proceed cautiously and don't use excessive force.</b> Monitor evidence of services including marker tape, conduit, earthenware, bricks and changes in fill.</p>	
Work near mobile plant or vehicle (operated by subcontractors)	Failure to maintain safe distance from mobile plant, lack of communication with operators, failure to follow site rules	<p>Elimination – Minimise number of employees and time spent working near a mobile plant or vehicle. Use Supplier Registration process to ensure competent subcontractors. Do not use devices which may be distracting and move to a safe location away from plant operations to use mobile phone. Leave area of machinery immediately if anything observed to be unsafe.</p> <p>Substitution – Consult with construction contractors to encourage the selection of equipment with lower risk profiles.</p> <p>Isolation – Arrange working areas to facilitate separation (distance) between staff and use of mobile plant or vehicle, including minimising duration of work.</p> <p>Engineering Controls – Where possible, use physical barriers / fencing to separate people from use of mobile plant or vehicle. Ensure required guarding is properly fitted and that emergency stops are operational (to be tested before use).</p> <p>Administrative – Identify potential hazards, develop JSEAs, conduct a Take 5, toolbox talk, and an induction to address safe work near mobile plant or vehicle. Establish clear communication and approach protocols with plant/vehicle operators, ensure they are appropriately trained, and hold required certificates of competency. Remain within the Operators field of vision and maintain positive communications with the Operator. Maintain a safe clearance from plant and do not enter the exclusion zone set by the Operator. Follow all reasonable instructions and directions from Operators.</p> <p>PPE – Adopt minimum standards of PPE including steel capped boots, high visibility vest, hard hat, long pants and long sleeves to mitigate impacts associated with working around plant. Safety glasses and gloves are available for staff.</p>	Moderate
Undertaking logging and sampling	Approaching mobile plant	<p>Administrative – Do not approach plant unless you have a valid reason. Wait in a safe access location outside the exclusion zone and make visual/radio contact with the Operator.</p> <p>Elimination - Only enter the exclusion zone after plant is secured and the Operator has signalled that it is safe to approach.</p> <p>Engineering Controls - Plant must come to a complete stop, lower attachments to ground and engage park brake. Whilst in the exclusion zone, plant must remain secured and you must follow all reasonable directions of the Operator. Only stand at the short end of an excavation. <b>Entry into an unsupported excavation greater than the individual's waist height is prohibited.</b></p>	Moderate
Work near excavations	Falls through lack of awareness, distraction by mobile phone, open excavations, excavation collapse	<p>Elimination – Do not access the areas around excavations unless it is necessary and do not go closer than 1 m of the edge of excavations. Do not enter any excavation greater than waist deep unless support systems are in place. Plan work tasks to minimise the time spent working near excavations. Ensure that construction contractors have identified and isolated / protected all underground services prior to excavation.</p> <p>Substitution – Encourage construction contractors to perform excavation via mechanical means rather than hand digging.</p> <p>Engineering Controls – Ensure that construction contractors use techniques such as benching, battering or shoring of excavations to prevent collapse. Encourage consultation with geotechnical engineers and with structural engineers (if structures are present) to ensure appropriate design of these controls. Encourage the temporary stabilisation of excavation walls during adverse weather, and encourage backfilling of excavations as quickly as possible.</p>	Moderate

THE FOLLOWING PROCEDURE SHALL APPLY IN THE EVENT OF AN EMERGENCY:

		Administrative – Identify potential hazards, develop JSEAs, conduct a Take 5, toolbox talk, and an induction to communicate with other workers regarding excavations. PPE – Adopt the minimum PPE requirements for construction sites.	
Use of hand-held plant / equipment	Overuse injury from manual labour using hand-held plant/equipment	Elimination – Minimise time spent using hand help equipment. Administrative – Review instruction manuals to ensure familiarity with proper methods of use and posture to limit repetitive injuries to hands/arms and back. PPE – Adopt minimum standards of PPE for appropriate type of work / equipment used. Gloves available for works.	Moderate
Environment Hazards, Risks & Controls			
What are the tasks involved?	What are the hazards and risks?	What are the controls measures?	What is the residual risk rating?
Site works cause pollution from waste	Contamination of environmental receptors Non-compliance with regulations	Elimination – Waste should be minimised during site works. Work area to be kept tidy and clean. Isolation & Engineering Controls – Boreholes to be reinstated and hand compacted, with turf replaced as far as practicable to minimise potential for dust or sediment run-off. Excess spoil from groundwater well installation to be spread on site provided that there is no evidence of contamination and can be spread safely without trip hazard. Administrative - Conduct a Take 5, toolbox talk, and an induction to communicate any potential risks and remind the avoid, reduce, reuse and recycle principles.	Low
Entering and leaving site by car	Spread of invasive species and pathogens, disturbance to flora and fauna	Elimination – Plant and vehicles to be clean prior to entering site. Local requirements in relation to level of invasive species control must be checked and followed (where relevant). Isolation & Engineering Controls – Plant to be unloaded as close to test pit as possible. Minimise vegetation damage by tracking on established paths. Do not remove or damage vegetation unless clearing has been previously agreed. Administration - Visually inspect plant and vehicles before leaving site – they must be free of loose materials such as mud and vegetation. Follow SGW induction requirements in relation to decontamination.	Low
Soil sampling	Collection of large quantity of bulk soil bags and jars	Substitution – Where possible transfer samples directly into site vehicle for transport to laboratory. Engineering Controls – Transport samples from sampling area to site vehicle on a trolley. PPE – Adopt minimum standards of PPE for appropriate type of work / equipment used. Gloves available for works and suitable footwear.	



Emergency Response

To be determined by Sydney Metro and SystemsConnect induction. Assess site specific risks and emergency responses upon arrival. Designate a muster point. Project team to stay together at all times during the site inspection.

Bradley, Nelson and Ryan to communicate with each other and Liam as required.

JSEA Approval

Version	Date	Notes / Changes	Author Name	Approver Name
1.0	05 September 2023			L Gooley

### Nation Partners Risk Matrix

Consequence							Likelihood				
							Occurs often	Likely to occur	Could occur but more than likely it wont	May occur only unusual circumstances	Would only occur under exceptional circumstances
Health & Safety	Environment	Financial	Legal	Service Delivery	Stakeholder		Almost Certain	Likely	Possible	Unlikely	Rare
Several deaths	Irreversible large-scale environmental damage	Direct cost or lost opportunity >\$1M	Prosecution resulting in imprisonment	Complete and irreparable loss in ability to deliver services	Stakeholder outrage, with widespread irreparable damage to reputation	Extreme	Very High	Very High	High	High	Moderate
One death	Long term, moderate-scale environmental damage	Direct cost or lost opportunity \$100k - \$1M	Significant non-compliance resulting in litigation / substantial financial loss	Severe loss in ability to deliver services, but recoverable at high cost and substantial effort	Major stakeholder concern, with widespread, recoverable damage to reputation	Major	Very High	High	High	Moderate	Moderate
Serious injury requiring professional medical treatment	Medium term, small scale environmental damage	Direct cost or lost opportunity \$10k - \$100K	Significant non-compliance resulting in substantial financial loss	Moderate loss in ability to deliver services, with substantial effort to recover	Stakeholder concern with irreparable impact on relationship	Moderate	High	High	Moderate	Moderate	Low
Injury requiring first aid treatment	Short-term, isolated environmental damage	Direct cost or lost opportunity \$1k - \$10k	Non-compliance resulting in a minor financial loss	Minor loss in ability to deliver services, with little effort to recover	Stakeholder disappointment, with reasonable impact on relationship	Minor	High	High	Moderate	Low	Low
Minor injury requiring no active treatment	Minor change from baseline environmental condition	Direct cost or lost opportunity <\$1k	Minor non-compliance with a regulatory or contractual obligation with no impact	Minor change from normal operating conditions	Stakeholder unease, with minor impact on relationship	Insignificant	Moderate	Moderate	Low	Low	Low





## C Sub-contractor SWMS



## UNDERTAKING SERVICE LOCATION WORK

OHS – SWMS – SS - 05

<b>Company Details</b>	Smart Scan Locators Unit E7, 13-15 Forrester Street, Kingsgrove, NSW, 2208	ABN: 84 622 814 813
<b>SWMS Development/ Approval</b>		<b>Project Specific Information</b>
<b>Initial SWMS Development:</b>		<b>Project</b> Generic – yet to be made project specific for Chatswood.
<b>Date Developed:</b>		<b>Client</b>
<b>Reviewed By:</b>		<b>Contact Name</b>
<b>Signature:</b>		<b>Contact Number</b>
<b>Date:</b>		<b>Project Address</b> <div style="background-color: #e0e0e0; height: 20px; width: 100%;"></div>

Legislation & Competencies	
<b>Activity Description</b>	Utility Locating and Detection
<b>OHS Legislation</b>	NSW WHS Act 2011, WHS Regulation 2017
<b>Code Practice AS Standards</b>	How to Manage Work Health and Safety Risks Code of Practice 2011
<b>Referenced SWMS</b>	
<b>Other References</b>	
<b>Certificate of Competency</b>	<ul style="list-style-type: none"> <li>▪ General Construction Induction Card (formerly Blue/White Card)</li> <li>▪ National Utility Location Contractor Association (Underground Asset Location Certified)</li> <li>▪ DBYD Locator Accreditation</li> </ul>
<b>Training Competencies</b>	General Construction Induction Card (formerly Blue/White Card), Project and site induction
<b>Verification of competency</b>	VOC for equipment being used

Activity Requirements	
<b>Plant &amp; Equipment</b>	EMF Locator, GPR and hand tools
<b>Material Requirements</b>	Dy-Mark Marking paint
<b>Crew Requirements</b>	Vehicle daily pre-starts and safety checklists

<b>PPE Requirements</b>	Safety Boots	x	High Visibility Clothing	x	Long Sleeve Clothing	x
	Gloves	x	Hearing Protection		Safety Glasses/goggles	x
	Respirator		Hard Hat	x	Sunscreen	x

	<b>UNDERTAKING SERVICE LOCATION WORK</b>	OHS – SWMS – SS - 05
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<b>Maintenance/Prestart Checks</b>	Check that all equipment and associated materials to be used onsite are available and in good working condition before leaving the office. Check all equipment is calibrated. Check all batteries are charged
<b>Other:</b>	

Table 1 – Consequence Table		
Given that the event occurs, what is the likely outcome?		
Level	Descriptor	Consequence
5	Insignificant	Minor incident, No treatment required
4	Low	Minor injury, treated by first aid
3	Medium	Minor Medical treatment required
2	Major	Serious injuries, hospitalisation
1	Severe	Fatalities

Table 2 – Likelihood Table		
How likely is it that the event will occur?		
Level	Descriptor	Description
R	Rare	May occur, only in exceptional circumstances
U	Unlikely	Could occur at some although is improbable
P	Possible	Event might occur at some stage
L	Likely	Event will probably occur in most circumstances
A	Almost Certain	Event expected to occur in most circumstances

Table 3 – Qualitative Risk Assessment Matrix					
LIKELIHOOD	Consequence				
	Level 1 Severe	Level 2 Major	Level 3 Medium	Level 4 Low	Level 5 Insignificant
A – Almost Certain	A1	A2	A3	A4	A5
L – Likely	L1	L2	L3	L4	L5
P – Possible	P1	P2	P3	P4	P5
U - Unlikely	U1	U2	U3	U4	U5
R - Rare	R1	R2	R3	R4	R5

Risk Level	
Risk Rating Colour	Action
High	Immediate
Medium	ASAP
Low	When Possible
The risk levels require different time frames for action. Extreme risks require immediate action, low risk may not need any actions. Use the hierarchy of controls to reduce the residual risk to as low as possible.	



**UNDERTAKING SERVICE LOCATION WORK**

OHS – SWMS – SS - 05

Business Defined High Risk Work Tasks				
Work at Heights		Work in areas that may be contaminated or flammable atmosphere		Work on a telecommunications tower
Working around mobile plant		Work in/near trench, excavation or pit deeper than 1.5m		Work in a tunnel
Work with Temporary work		Work in/near a confined space		Work likely to involve disturbing Asbestos
Work with Live services		Demolition of load bearing structure		Diving work
Work near Live traffic (road or rail)		Tilt up or precast concrete elements		Work in or near chemical/fuel/refrigerant lines
Electrical work		Work in extreme temperatures		Use of explosives
Work involving cranes or lifting operations		Work in or near water or other liquid that involves a risk of drowning		A task that is not yet defined as a High risk Work task



## UNDERTAKING SERVICE LOCATION WORK

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**Table 4 – Hierarchy of Controls**

The consideration of controls in all risk assessments, Safe Work Method Statements (SWMS) and Safe Work Procedures (SWP) developed will be based on the “Hierarchy of Controls”, with Elimination being considered the most effective control through Personal Protective Equipment controls being considered the least effective control.

<b>Control Measure</b>	<b>Description</b>
Elimination	Controls risk by eliminating the hazard eg. Positioning controls and ground level eliminates risk of fall from heights
Substitution	Replace the hazard (eg. Plant or substance) with another that has a lower and/or zero risk. This may also eliminate the risk
Isolation	Isolate the hazard from people eg. Locked access to a hazard eg. Lock first level of a ladder from use on a tower
Engineering	Remove or separate people from the source of the hazard eg. Guarding, noise barriers etc
Administrative measures	Use policies, procedures, sign, staff rotation and training etc to minimise the effect of the risk
Personal Protective Equipment	Provide equipment or clothing designed to protect the worker eg. Ear muffs, steel capped boots etc



## UNDERTAKING SERVICE LOCATION WORK

OHS – SWMS – SS - 05

Safe Work Method Statement										
Work Activity	Hazard No	Potential Hazards & Assessment	Risk Rating			Control Measure to be implemented	Residual Risk			Person Responsible
			L	S	R		L	S	R	
Driving to location	1	Accident from congestion/High Traffic volume	U	1	U1	<ul style="list-style-type: none"> <li>Maintain safe distance 3 second rule from vehicle in front</li> </ul>	R	2	R2	Vehicle Operator
	2	Vehicle Breakdown	P	4	P4	<ul style="list-style-type: none"> <li>Ensure pre-vehicle checklist is completed weekly or prior to every 2 plus hour journey</li> </ul>	U	4	U4	Vehicle Operator
	3	Road Conditions poor/adverse	L	3	L3	<ul style="list-style-type: none"> <li>Current driver licence logged into training database</li> <li>Adjust speed to suit conditions</li> </ul>	L	4	L4	Administrator Vehicle Operator
	4	Fatigue	P	4	P4	<ul style="list-style-type: none"> <li>If distance is over 100km shared driving</li> <li>Every 2 hours of driving to have a rest break</li> <li>If you are feeling tired, stop for a rest and reassess after 20 minutes</li> </ul>	U	4	U4	Vehicle Operator
Unloading Vehicle	1	Manual Handling – taking GPR off vehicle	P	3	P3	<ul style="list-style-type: none"> <li>Use two man lift with correct technique for heavy items 25kg +</li> </ul>	U	4	U4	Locator
Working near live traffic	2	Slips, Trips and Falls	U	3	U3	<ul style="list-style-type: none"> <li>Carry out pre-work site assessment checklist</li> <li>Ensure vehicle is parked in a stable area</li> </ul>	R	4	R4	Locator
	3	Traffic – on road beside vehicle	U	2	U2	<ul style="list-style-type: none"> <li>Remove equipment from rear or non-traffic side of vehicle</li> <li>Follow Traffic control plan</li> <li>Maintain safe distance from traffic</li> </ul>	R	4	R4	Locator

GPR/EMI Locating  Working near Live Traffic	1	Traffic – Locating crossing road	L	2	L2	<ul style="list-style-type: none"> <li>Use alternative path if possible</li> <li>PPE – High Visibility clothing, boots</li> <li>Follow directions provided by Traffic control</li> <li>Communicate with Traffic control prior to entering roadway</li> <li>STOP – LOOK – LISTEN before crossing</li> </ul>	R	4	R4	Locator
	2	Traffic – Operating on roadside (footpath)	P	2	P2	<ul style="list-style-type: none"> <li>Treat as same as crossing road</li> <li>Do not work near major roads during peak traffic hours</li> <li>PPE – High Visibility clothing, boots</li> <li>Use spotter while operating on roadside</li> <li>STOP – LOOK – LISTEN before conducting marking</li> <li>Follow directions provided by Traffic control</li> </ul>	R	4	R4	Locator
	3	Slips, Trips and Falls	P	3	P3	<ul style="list-style-type: none"> <li>Carrying out pre-work site assessment.</li> <li>Avoid wet areas</li> <li>Take care on uneven surfaces</li> </ul>	R	4	R4	Locator
	4	Hazardous Substance – Marking paint	P	3	P3	<ul style="list-style-type: none"> <li>Use at arms lengths range from body</li> <li>Spray away from body</li> <li>Refer to SMDS sheet in Safety folder</li> </ul>	R	4	R4	Locator
	5	Manual Handling – Taking GPR off vehicle	P	3	P3	<ul style="list-style-type: none"> <li>Use two man lift with correct technique for heavy items over 25kg</li> </ul>	U	4	U4	Locator
Service pit/manhole Inspection  Working near pit deeper than 2m	1	Fingers caught in pit lid or injury from falling into pit during opening	L	2	L2	<ul style="list-style-type: none"> <li>Secure the area with manguards or barriers</li> <li>Ensure you have the correct opening tool for the specific type of pit</li> <li>Hook the pit opening tool in the latch and turn 90 degrees to lock into place</li> <li>Use a flathead screwdriver to remove debris from the seal</li> <li>Place feet evenly on each side behind the pit, use a straight back while bending from knees to remove the lid and drag carefully towards you</li> </ul>	R	4	R4	Locator

<p>Rodding of pipes inside Pit</p> <p>Working near pit deeper than 2m</p>	2	Fall into open pit resulting in injury	L	2	L2	<ul style="list-style-type: none"> <li>Do not use your hands to open a pit lid</li> <li>Pit lid is secured or safely away from open pit</li> <li>If there is any sign or smell of gasses. Stop immediately and consult your supervisor before proceeding. Gas Detection may be required</li> <li>Feet planted safely on either side of pit</li> <li>Use a torch to see clearly into pit</li> <li>Do not lean over into pit</li> <li>Work from behind man guards</li> </ul>	R	4	R4	Locator
	3	Contact to Hypodermic Needles	P	3	P3	<ul style="list-style-type: none"> <li>Do not remove needles unless obstructing work area</li> <li>Use tool to brush needles from work area, wearing gloves</li> <li>Inform site supervisor</li> </ul>	R	4	R4	Locator
	1	Rodding of pipes inside pit- resulting in fall from height				<ul style="list-style-type: none"> <li>Wear Gloves</li> <li>Ensure both feet are a safe distance behind the pit opening</li> <li>Loosen brake from rodder and gently pull head of cable out of frame</li> <li>Carefully insert head of rodder inside pipe and push up the pipe, some force may be required for bends</li> <li>If the pipe is more than 0.6m beneath ground surface a guide PVC pipe should be used so that at no point should the Locator be required to lean into pit.</li> <li>Place guide pipe on pit floor insert rodder through guide pipe and angle into pipe</li> <li>Work from behind manguard</li> </ul>				
	2	Traffic when working in pit on road	L	2	L2	<ul style="list-style-type: none"> <li>PPE – High Visibility clothing</li> <li>Follow directions provided by Traffic control</li> <li>Communicate with Traffic control prior to entering roadway</li> </ul>	R	4	R4	Locator



						<ul style="list-style-type: none"> <li>Utilise TC vehicle for protection</li> <li>STOP – LOOK – LISTEN - Before moving around pit</li> </ul>				
	3	Contact with sewage	P	3	P3	<ul style="list-style-type: none"> <li>Avoid rodding pipe if possible</li> <li>Wear gloves</li> <li>After removing rodder place in bucket of water and antibacterial wash and clean</li> <li>Wash hands and use hand sanitizer</li> </ul>	U	4	U4	Locator
	4	Closing of pits	P	4	P4	<ul style="list-style-type: none"> <li>Move to the opposite side of pit</li> <li>Hook the pit opening tool into lid and turn 90 degrees to lock into place</li> <li>Drag the pit lid back into place</li> <li>Check the pit lid is correctly in place</li> </ul>	U	4	U4	Locator
Returning from location	1	Accident from congestion/High Traffic volume	U	1	U1	<ul style="list-style-type: none"> <li>Maintain safe distance 3 second rule from vehicle in front</li> </ul>	R	2	R2	Vehicle Operator
	2	Vehicle Breakdown	P	4	P4	<ul style="list-style-type: none"> <li>Ensure pre-vehicle checklist is completed weekly or prior to every 2 plus hour journey</li> </ul>	U	L	L4	Vehicle Operator
	3	Road Conditions poor/adverse	L	3	L3	<ul style="list-style-type: none"> <li>Current driver licence logged into training database</li> <li>Adjust speed to suit conditions</li> </ul>	L	4	L4	Administrator Vehicle Operator
	4	Fatigue	P	4	P4	<ul style="list-style-type: none"> <li>If distance is over 100km shared driving</li> <li>Every 2 hours of driving to have a rest break</li> <li>If you are feeling tired, stop for a rest and reassess after 20 minutes</li> </ul>	U	4	U4	Vehicle Operator



**UNDERTAKING SERVICE LOCATION WORK**

OHS – SWMS – SS - 05

**SWMS INSPECTION SHEET**

SWMS Name: \_\_\_\_\_ Location/Area: \_\_\_\_\_ Inspected By: \_\_\_\_\_  
 Position: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

No.	Item	Finding	Comment	Date Defect Rectified
1	Site inducted personnel			
2	PPE being worn			
3	Falls from height			
4	Certified operator			
5	Trip Hazards/house keeping			
6	Falling objects			
7	Access/egress			
8	Electrical/generators			
9	Manual Handling			
10	Cranes/lifting equipment			
11	Permits			
12	Access, work platforms			
13	Fire extinguishers			
14	MSD's for products used			
15	Barricading/signage			
16	Covering of penetration			
17	Cause environmental damage			

<b>Findings</b>	Acceptable ✓	Unacceptable = X	Not applicable = N/A
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Inspections will be carried out using the above sheet quarterly

No.	Defects Noted	No.	Close out actions

**UNDERTAKING SERVICE LOCATION WORK**

OHS – SWMS – SS - 05

## MATERIAL CONTROLS

Material	Controls
Marking Paint	<ul style="list-style-type: none"><li>▪ Provide sufficient ventilation</li><li>▪ Provide sufficient storage ie. a cool, dry, well-ventilated area</li><li>▪ Handle with appropriate PPE, i.e. gloves and eye protection</li><li>▪ Prohibit sources of sparks</li><li>▪ All empty cans to be taken off site and disposed of correctly</li><li>▪ Refer to SDS in Shared drive Safety folder</li></ul>



## UNDERTAKING SERVICE LOCATION WORK

OHS – SWMS – SS - 05

### SIGNOFF

We, the undersigned, confirm that the SWMS nominated above has been explained and its contents are clearly understood and accepted. We also confirm that our required qualifications to undertake this activity are current. We also clearly understand the controls in this SWMS must be applied as documented; otherwise work is to cease immediately.

Name	Qualification required for this activity	Signature	Date	Time	Employer



## D Synergy Asbestos Works Plan and SWMS



TOTAL  
CONTRACTING  
SERVICES

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ASBESTOS WORKS PLAN  
TEST PITTING  
SYDNEY METRO – CHATSWOOD DIVE SITE  
NATION PARTNERS

Document Identification Number: AWP01  
Document Revision Number: 0  
Document Revision Date: 06/09/2023  
(Controlled Copy)

## Contents

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5. Project Details
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11. Roles & Responsibilities
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14. Test Pitting Methodology
15. Unexpected Finds
16. Air Monitoring
17. Decontamination
  - 17.1 Personal Decontamination
  - 17.2 Vehicle & Plant Decontamination
18. Clearance Certificates
19. Waste Disposal
20. Validation Reporting

Appendix

1. Nation Partners - NP22202\_Contamination Memo\_v1.0
2. Synergy Class A Friable Asbestos Removal Licence
3. SafeWork Notification of Licensed Asbestos Removal Work
4. Site Induction Record (SYN24)\_Dashpivot Template
5. Pre-Start Meeting Record (SYN08)\_Dashpivot Template
6. Environmental & Safe Work Method Statements
7. Plant Pre-Start Checklist (SYN20)\_Dashpivot Template
8. Hazard / Aspect Report (SYN13)\_Dashpivot Template
9. Incident Report (SYN26)\_Dashpivot Template
10. Proposed Sampling Locations (Nation Partners SAQP 21.07.23)
11. Unexpected Finds Protocol (SYN74)



## Asbestos Works Plan

### 1 – Introduction

As part of a larger scope of works, Nation Partners (the Principal Contactor) have been engaged by Sydney Metro (the Site Owner) to undertake a Pre-Remediation Investigation at the Sydney Metro Chatswood Dive Site located at 355 Mowbray Road, Chatswood NSW (the Site). Synergy Resource Management Pty Ltd (Synergy) have been engaged by Nation Partners as a subcontractor to undertake certain scope elements of the site investigation.

### 2 - Document Purpose

Nation Partners have developed and shall implement the overarching *Chatswood Metro Pre-Remediation Investigation Health, Safety and Environment Plan (HSEP)* to identify and outline the management of health, safety and environmental risks for the work to be undertaken by Nation Partners and its subcontractors.

Synergy have developed and shall implement the Asbestos Works Plan (AWP) as a sub-plan to the *HSEP*, to comply with legislative, regulatory and stakeholder requirements. The AWP will be maintained as a 'working document' for the duration of the work. Synergy will:

- ✦ Maintain an up-to-date printed version of the AWP on site;
- ✦ Implement and comply with the requirements of the AWP for the duration of works;
- ✦ Induct personnel involved in with the works into the relevant requirements of the AWP; and
- ✦ Provide a copy of the current version of the AWP and amended documentation to the appropriate project stakeholders.

### 3 – Document Revision Status

The following revision status record shall be maintained to identify the current revision status of the AWP.

Revision Number	Revision Date	Prepared By		Reviewed & Approved By	
		Name	Position	Name	Position
0	06/09/2023	Jay Bonnor	Synergy EHSQ Coordinator	Jacob Barnes	Synergy Project Manager

The Synergy Project Manager shall oversee the production and issue of all Synergy project documentation.

### 4 – Cloud-Based Management System Software Platform

Working documents, such as project specific records, registers, checklist and reports, which are provided in the AWP appendix, may be completed by workers using digital versions through the Synergy cloud-based management system software platform (Dashpivot).

## 5 - Project Details

Site Owner Details	
Name:	Sydney Metro City & Southwest
Phone Number:	1800 171 386

Principal Contractor / Environmental Consultant Details	
Name:	Nation Partners
Address:	Suite 306, 50 Holt Street, Sydney. NSW 2010
Project Representative:	Bradley Coates – Senior Consultant
Phone Number:	0404 236 106
Email:	bcoates@nationpartners.com.au

Asbestos Removal Contractor Details	
Name:	Synergy
Address:	Unit 1, 2 Forge Place, Narellan. NSW 2567
Project Manager:	Jacob Barnes
Phone Number:	0408 704 787
Email:	jacob.barnes@synergyresource.com
Project Supervisor:	Adam Webster
Phone Number:	0428 805 622
Email:	adam.webster@synergyresource.com
EHSO Coordinator:	Jay Bonnor
Phone Number:	0434 516 017
Email:	jay.bonnor@synergyresource.com

Licenced Asbestos Assessor	
Name:	Progressive Risk Management (PRM)
Address:	Unit 14, 76 Reserve Road, Artarmon. NSW 2064
Contact 1:	Emily Guy
Phone Number:	0493 402 824
Email:	emily.guy@progressiverm.com
Contact 2:	Justin Walker
Phone Number:	0466 650 243
Email:	justin.walker@progressiverm.com

Project Details	
Project Name:	Test Pitting Works - Nation Partners, Sydney Metro Chatswood Dive Site
Site Address:	355 Mowbray Road, Chatswood. NSW 2067
Site Description:	<p>The Site is used to facilitate and provide construction activities for new Sydney Metro infrastructure and was used to launch and support two tunnel boring machines. With tunnelling complete, it remains an active construction site with tunnel fit out and construction of the northern dive building ongoing.</p> <p>The subsurface material at the Site is believed to be contaminated with Asbestos Containing Material (ACM).</p> <p>The site is currently occupied by Systems Connect (an unincorporated joint venture between CPB Contractors and UGL), for line-wide construction activities.</p>

Scope of Works:	<p>The scope of works that Synergy have been engaged to complete as part of an Environmental Investigation by Nation Partners is as follows.</p> <ul style="list-style-type: none"> <li>➤ Provide asbestos air monitoring at a minimum of 8 locations across the site during the works, with a daily clearance certificate.</li> <li>➤ Provide concrete cutting operations to remove hardstand from test pit locations.</li> <li>➤ Load and transport concrete waste to approved central location on site.</li> <li>➤ Excavate up to 40 test pits to approximately 2 mgbl in locations directed by Nation Partners who shall be collecting soil samples.</li> <li>➤ Re-instate excavated material back into excavation.</li> <li>➤ Place and secure road plate to cover backfilled excavation (road plate to be provided by others).</li> </ul>
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## 6 – Identification of Contamination

Nation Partners have advised Synergy it is highly likely that ACM will be encountered in the subsurface material being excavated for test pitting and sampling activities.

Previous site investigations and sample analysis by others have confirmed the presence of ACM at the site. Nation Partners shall provide Synergy with a Contamination Memo for notification purposes.

[Refer to Appendix 1 – Nation Partners - NP22202\\_Contamination Memo\\_v1.0](#)

## 7 – Licensing

The test pitting works do not involve any removal of impacted soil or other material offsite, however as ACM is likely to be encountered and handled during excavation, all site works shall be undertaken in accordance with relevant legislation and guidelines, particularly those relating to working with asbestos impacted soils.

Synergy holds a current Class A Friable Asbestos Removal Licence issued by SafeWork NSW to facilitate the works.

[Refer to Appendix 2 – Synergy Class A - Friable Asbestos Removal Licence.](#)

## 8 – Notifications & Approvals

### 8.1 – SafeWork NSW

A Notice of Intent to Remove Non-Friable Asbestos has been submitted for the works via the SafeWork NSW Asbestos and Demolition online notification system.

[Refer to Appendix 3 - SafeWork Notification of Licensed Asbestos Removal Work.](#)

### 8.2 – Site Occupier

Synergy understands that Nation Partners shall liaise with Sydney Metro, to notify them of the proposed works and dates which they shall be performed. Synergy shall coordinate the works to minimise disruptions to the Systems Connect line-wide construction activities as far as practical.

## 9 - Environmental Management

### 9.1 – Dust

The following controls measures shall be implemented during the works to minimise the potential for dust generation:

- ✦ Limiting ground disturbance to the immediate areas of the Site required to perform the test pitting works;
- ✦ Suppressing dust during concrete cutting and materials handling operations with water spray / mist;
- ✦ Temporarily ceasing materials handling operations during high-wind conditions; and
- ✦ Vehicles transporting materials to / from the Site shall have sealed bodies and their loads covered.

### 9.2 – Emissions

The following controls measures shall be implemented during the works to minimise emissions from plant / vehicles operating on the Site:

- ✦ Exhaust system mufflers to be fitted and functioning correctly on all plant / vehicles;
- ✦ Drivers / operators to be instructed to operate plant / equipment in a manner that avoids excessive engine revving;
- ✦ Plant / vehicles to be turned off when not in use; and
- ✦ Plant / vehicles to be maintained regularly and serviced as per the manufacturer's specifications.

### 9.3 – Noise & Vibration

To minimise noise and vibration disturbance, Synergy shall carry out the works during the following days / hours of work:

- ✦ Monday to Friday: 07:00 – 17:30; and
- ✦ Saturdays, Sundays and Public Holidays: No work is permitted.

The following control measures shall be implemented during the works to minimise noise and vibration impacts to sensitive receivers in the vicinity of the Site:

- ✦ Exhaust system mufflers to be fitted and functioning correctly on all plant / vehicles;
- ✦ Drivers / operators to be instructed to operate plant / vehicles in a manner that does not generate unnecessary noise, through avoiding excessive engine revving etc.;
- ✦ Plant / equipment speeds to be limited to site specific speed limits; and
- ✦ Plant / vehicles to be turned off when not in use.
- ✦ **Plant to be fitted with non-tonal alarms where feasible**

## 10 – Workplace Health & Safety

### 10.1 – Rail Industry Worker (RIW) Requirements

Because the works are required within an active Sydney Metro construction site, workers and subcontractor personnel are required to hold a current Rail Industry Worker (RIW) Card and to have completed the necessary Sydney Metro site inductions prior to arrival on site.

The Nation Partners *HSEP* provides additional information and instructions for site access requirements which Synergy shall comply with.

## 10.2 – Synergy Site Induction

To ensure that Synergy workers and subcontractor personnel possess the requisite information, knowledge and competencies all persons intending to perform the works on the Site are also required to complete Synergy site induction training prior to commencement. Attendees of the Synergy site induction are required to complete the *Site Induction Record* to confirm that they have been advised of, and have understood, the necessary information.

During the Synergy site induction process, the inductee will be appropriately vetted to ensure they are suitably trained and competent for their intended tasks and familiar with the terms of the specification and required standards.

[Refer to Appendix 4 - Site Induction Record \(SYN24\)\\_Dashpivot Template.](#)

## 10.3 – Pre-Start Meetings

Synergy shall complete daily pre-start meetings as a tool for consultation, cooperation and coordination with workers. Pre-start meetings shall be completed daily before the commencement of work activities. The need for additional pre-start meetings may be identified where there are changes in work areas, plant, substances, work processes or systems which may require discussions on the potential hazards and control measures. Pre-starts are to be recorded and signed on to. Copies of completed / signed-off Pre-Start Meeting Records shall be provided to the Nation Partners project representative.

[Refer to Appendix 5 – Pre-Start Meeting Record \(SYN08\)\\_Dashpivot Template.](#)

## 10.4 - Environmental & Safe Work Method Statements

Synergy shall utilise Environmental & Safe Work Method Statements (ESWMS) to record the results of the hazard identification and risk assessment for particular site specific work activities and documenting the necessary control measures required to complete the task safely and correctly. ESWMS have been prepared for all 'high risk construction work' as defined in the WHS Regulation. Personnel are required to read and sign the ESWMS prior to commencing the works to confirm that they are aware of the necessary control measures required to perform the activity.

[Refer to Appendix 6 – Environmental & Safe Work Method Statements.](#)

## 10.5 – Overhead & Underground Services

### Overhead Services

No overhead service hazards have been identified associated with the current scope of work during preliminary Site investigations.

Should overhead services be identified during the works, Synergy shall ensure that the correct approach distances are maintained from the overhead services. Exclusion zones for untrained persons are provided in the *SafeWork NSW - Code of Practice 2006: Work Near Overhead Powerlines Code of Practice*.

### Underground Services

Synergy understands that Nation Partners have requested Dial Before You Dig plans to facilitate the test pitting works and will also engage a professional service locating contractor to check each test pit location for underground services / infrastructure not identified on the Dial Before You Dig plans.

The Synergy Project Manager shall ensure that the correct approach distances are maintained from underground services should they be identified, in accordance with the *SafeWork NSW - Work Near Underground Assets Guide 2007*.

#### 10.6 – Plant & Equipment

As a Systems Connect requirement for the site, all plant and equipment proposed for use must be onboarded to the project using the CheckRite online system. Synergy shall register for a CheckRite account to ensure the onboarding procedure is followed and complied with for all relevant plant and equipment proposed for the works.

Plant operator licenses / competencies shall be verified during the site induction process.

Plant pre-start checks shall be completed daily by the operator prior to the commencement of works, to confirm that the plant is in good working order and in a safe condition for use. The daily plant inspections shall be documented on the Plant Pre-Start Checklist or a suitable alternative.

[Refer to Appendix 7 - Plant Pre-Start Checklist \(SYN20\)\\_Dashpivot Template.](#)

#### 10.7 – Hazard / Aspect Reporting

Minor safety hazards or environmental aspects that are identified by the Synergy Project Supervisor may be verbally reported to the responsible worker or subcontractor personnel and recorded on the daily site diary. A hazard / aspect is considered minor if it does not require significant rectification and will not result in a high-risk situation or significant environmental impact if corrected immediately. Such minor hazards / aspects do not require formal action through the issue of a **Hazard / Aspect Report** where they can be easily rectified on the spot through agreement with Synergy Project Supervisor and responsible worker or subcontractor personnel. Failure of the worker or subcontractor personnel to rectify a minor hazard / aspect, or for a previously identified minor hazard / aspect being repeated, will result in the issuance of a **Hazard / Aspect Report**.

All other new hazards / aspects or known hazards / aspects which have not been eliminated or the risk / impact level suitably controlled, shall be recorded on the **Hazard / Aspect Report** (Part A) which shall be submitted to the Synergy EHSQ Manager and Nation Partners project representative for review.

[Refer to Appendix 8 – Hazard / Aspect Report \(SYN13\)\\_Dashpivot Template.](#)

The Synergy EHSQ Manager shall liaise with the Synergy Project Supervisor and others exposed to the hazard / aspect to determine the necessary corrective action required. The Synergy EHSQ Manager will record the corrective action required, nominate a person responsible for its implementation and specify an appropriate timescale on the **Hazard / Aspect Report** (Part B).

The Synergy EHSQ Manager shall allocate an 'Event Number' for tracking purposes and record the **Hazard / Aspect Report** on the Synergy **Corrective Action Register** to monitor implementation of the corrective action.

The **Hazard / Aspect Report** with Parts A and B completed shall be issued to the nominated Synergy worker or subcontractor personnel responsible for implementation of the corrective action. The nominated person is required to sign and date the **Hazard / Aspect Report** (Part C) once the corrective action has been implemented.

Synergy workers and subcontractor personnel shall be notified of the necessary corrective action required via a documented toolbox talk meeting signed-off by all in attendance.

The Synergy Project Supervisor shall confirm that the corrective action has been implemented by countersigning the *Hazard / Aspect Report* (Part C). The Synergy Project Supervisor shall forward a copy of the *Hazard / Aspect Report* with Parts A, B and C completed to the Synergy EHSQ Manager and the Nation Partners project representative. Once all parties are satisfied, the Synergy EHSQ Manager shall close-out the non-conformance event on the *Corrective Action Register*.

#### 10.8 - Workplace Incident, Injuries or Illnesses

Synergy workers and subcontractor personnel who sustain a workplace injury or illness, or who experience a 'near miss' incident, should immediately notify the Synergy Project Supervisor. The Synergy Project Supervisor shall provide first aid treatment, arrange transportation to a local medical centre or emergency department, or will contact the emergency services as required. If the incident presents an immediate risk to human health or property the Synergy Project Supervisor shall call 000. The Synergy Project Supervisor shall implement emergency corrective action to prevent further injury or illness and notify the Synergy Project Manager. The affected worker shall complete the Incident Report.

The Synergy Project Manager shall immediately notify the Nation Partners project representative of all events, provide them with a copy of the Incident once available, and keep them updated throughout the investigation process.

The Synergy EHSQ Manager shall liaise with the Synergy Project Supervisor and others involved with and / or witnessing the incident to determine the root cause and identify the corrective action required to prevent reoccurrence. The focus shall be on identifying system deficiencies rather than apportioning blame. The Synergy EHSQ Manager will record the corrective action required, nominate a person responsible for its implementation and specify an appropriate timescale on the Incident Report (Part B).

The Synergy EHSQ Manager shall allocate an 'Event Number' for tracking purposes and record the incident on the Corrective Action Register to monitor implementation of the corrective action.

The Incident Report with Parts A and B completed shall be issued to the nominated worker or subcontractor personnel responsible for its implementation. The nominated person is required to sign and date the Incident Report (Part C) once the corrective action has been implemented.

Synergy workers and subcontractor personnel shall be notified of the necessary corrective action required via a documented toolbox talk meeting signed-off by all in attendance.

The Synergy Project Supervisor shall confirm that the corrective action has been implemented by countersigning the Incident Report (Part C). The Synergy Project Manager shall forward a copy of the *Incident Report* with Parts A, B and C completed to the Synergy EHSQ Manager and the Nation Partners project representative. Once all parties are satisfied, the Synergy EHSQ Manager shall close-out the event on the *Corrective Action Register*.

[Refer to Appendix 9 – Incident Report \(SYN26\)\\_Dashpivot Template.](#)

#### 10.9 – Emergency Response

Nation Partners shall provide the necessary information and guidance on the emergency response procedures during the site induction process.

Synergy workers and subcontractors shall be made aware of the requirements of the Nation Partners emergency response procedures outlined within the Nation Partners *HSEP* during the Synergy Site Induction.

## 10.10 – Emergency Contacts

Emergency Contact Numbers:			
Name:	Company:	Position:	Phone Number:
Bradley Coates	Nation Partners	Senior Consultant	0404 236 106
Robert Tosswill	Synergy	Operations Manager	0488 111 584
Jacob Barnes	Synergy	Project Manager	0408 704 787
Adam Webster	Synergy	Project Supervisor	0428 805 622
Jay Bonnor	Synergy		0434 516 017
SafeWork NSW			13 10 50
Emergency Services			000 (or 122)

## 11 – Roles & Responsibilities

It is understood by Synergy that Nation Partners Environmental Consultants roles and responsibilities include:

- ✦ Coordinate the works and liaise with Sydney Metro;
- ✦ Develop and implement a Workplace Health and Safety (WHS) Plan for the work; and
- ✦ Conduct environmental investigation including sampling and analysis of collected soil samples from test pitting operations.

The Suitably Qualified Person (SQP) / Licensed Asbestos Assessor (LAA) roles and responsibilities shall include:

- ✦ Implementing and monitoring compliance with the *Work Health & Safety Act 2011, Work Health & Safety Regulation 2011 and How to Safely Remove Asbestos Code of Practice 2011*;
- ✦ Providing onsite guidance and technical advice;
- ✦ Performing asbestos fibre air monitoring during the ACM handling operations to confirm the effectiveness of controls;
- ✦ Providing a visual clearance at the completion of each test pit; and
- ✦ Performing the necessary analytical sampling and validation reporting.

The Synergy Project Supervisor roles and responsibilities shall include:

- ✦ Comply with Nation Partners *HSEP*;
- ✦ Implementing and monitoring compliance with the AWP;
- ✦ Providing training in the requirements of the AWP to workers;
- ✦ Ensuring that workers are appropriately trained and competent;
- ✦ Ensuring that personnel undertaking the works are trained in the site-specific hazards and control measures required;
- ✦ Installing and maintaining an exclusion zone and appropriate warning signage around the work areas;
- ✦ Performing / overseeing the works;
- ✦ Ensuring that appropriate dust suppression activities are implemented during the works;
- ✦ Maintaining suitable decontamination facilities and equipment;
- ✦ Ensuring that workers implement the decontamination procedure when leaving the exclusion zone;
- ✦ Ensuring that plant, vehicles and equipment are decontaminated prior to leaving the exclusion zone; and
- ✦ Ensuring each test pit location has been visually cleared before fixing road plate and dismantling exclusion zone.



## 12 – Exclusion Zones

Exclusion zones shall be created around the locations involving the handling of ACM using a suitable barrier system, or temporary fencing to prevent access from non-essential personnel. Access to the exclusion zones shall be limited to the following persons:

- ✦ Workers who are undertaking the test pitting operations;
- ✦ Workers who are implementing the control measures;
- ✦ The SQP / LAA; and
- ✦ People who are allowed under the WHS Regulations or another law to be in an asbestos removal area (for example, inspector, emergency service workers).

Exclusion zones shall remain in place until a visual clearance inspection has been completed by the SQP / LAA

## 13 – Personal Protective Equipment

All personnel that need to access the exclusion zone will be provided with and shall wear the following PPE prior to entering and at all times when inside the area:

- ✦ Disposable coveralls (Type 5);
- ✦ Disposable boot covers over normal safety footwear;
- ✦ Nitrile gloves; and
- ✦ P2 disposable mask or half face respirator with P2 filters.

## 14 – Test Pitting Methodology

Each test pit location requires the existing concrete hard stand to be removed to gain access to the sub surface soil materials. Concrete road sawing will be performed to cut the concrete for removal. The concrete will then be removed by the excavator and placed in the back of the truck for disposal at a nominated and approved storage location on site.

Dust suppression shall be applied during all works, including concrete cutting, excavation, and placement of soils within the test-pit excavations.

Excavation for test pitting shall be performed mechanically with a suitable size excavator. Excavated materials are to be placed directly adjacent to the pit on the concrete hardstand to allow sampling activities to take place. Upon completion of the sampling, the material will be placed back into the pit to be covered up with a road plate which shall be secured to the concrete with suitable dyna bolts. Any surplus soils excavated and not placed back into the excavation shall be stored in sealed bins and signposted as asbestos containing.

[Refer to Appendix 10 – Proposed Sampling Locations \(Nation Partners SAQP 21.07.23\).](#)

## 15 – Unexpected Finds

It is possible that during work operations material or items may be encountered that are not what is expected. Should unexpected finds that are potentially hazardous or significant be encountered they must be reported immediately to the Synergy Project Supervisor and the Unexpected Finds Protocol shall be activated.

[Refer to Appendix 11 – Unexpected Finds Protocol \(SYN74\).](#)

## 16 – Air Monitoring

The SQP / LAA shall perform air monitoring in 8 selected locations throughout the site before and during the test pitting operations. The air monitoring shall involve static monitoring pumps being operated within and on the boundary of the exclusion zone to monitor the effectiveness of the control measures employed.

The following 'Action Levels' shall be observed. The 'Action Levels' are airborne asbestos fibre concentrations which, if exceeded, indicate there is a need to review current control measures or take additional action.

Action Level	Control	Action
Less than 0.01 fibres / ml	<ul style="list-style-type: none"> <li>✦ No new control measures are necessary</li> </ul>	<ul style="list-style-type: none"> <li>✦ Continue with control measures</li> </ul>
At 0.01 fibres / ml or more but less than or equal to 0.02 fibres / ml	<ul style="list-style-type: none"> <li>✦ Review</li> </ul>	<ul style="list-style-type: none"> <li>✦ Review current controls</li> </ul>
	<ul style="list-style-type: none"> <li>✦ Investigate</li> </ul>	<ul style="list-style-type: none"> <li>✦ Investigate the cause</li> </ul>
	<ul style="list-style-type: none"> <li>✦ Implement</li> </ul>	<ul style="list-style-type: none"> <li>✦ Implement corrective action to minimise / eliminate further release</li> </ul>
More than 0.02 fibres / ml	<ul style="list-style-type: none"> <li>✦ Stop removal works</li> </ul>	<ul style="list-style-type: none"> <li>✦ Stop works</li> </ul>
	<ul style="list-style-type: none"> <li>✦ Notify regulator</li> </ul>	<ul style="list-style-type: none"> <li>✦ Notify SafeWork NSW by phone followed by fax or written statement that work has ceased and the results of the air monitoring</li> </ul>
	<ul style="list-style-type: none"> <li>✦ Investigate the cause</li> </ul>	<ul style="list-style-type: none"> <li>✦ Conduct a thorough visual inspection of the enclosure (if used) and associated equipment in consultation with all workers involved with the removal work</li> </ul>
	<ul style="list-style-type: none"> <li>✦ Implement corrective action to minimise / eliminate further release</li> </ul>	<ul style="list-style-type: none"> <li>✦ Extend the isolated / barricaded area around the removal area / enclosure as far as reasonably practicable (until fibre levels are at or below 0.01 fibres / ml, wet wipe and vacuum the surrounding area, seal any identified leaks (eg with expandable foam or tape) and smoke test the enclosure until it is satisfactorily sealed</li> </ul>
	<ul style="list-style-type: none"> <li>✦ Do not recommence work until further air monitoring is conducted</li> </ul>	<ul style="list-style-type: none"> <li>✦ Do not recommence works until fibre levels are at or below 0.01 fibres / ml.</li> </ul>

## 17 - Decontamination

### 17.1 – Personal Decontamination

The decontamination zone shall be maintained at the edge of the exclusion zone. The decontamination zone shall consist of a decontamination station maintained on a catchment layer consisting of 200um plastic.

The following decontamination procedure shall be implemented at all times by personnel when leaving the exclusion zone:

- ✦ Enter decontamination area;
- ✦ Spray down protective clothing with a fine water mist spray;
- ✦ Remove any visible asbestos dust / residue from protective clothing using a damp cloths (Do not reuse or resoak damp cloths);
- ✦ Place cloths into 200um polythene sealable bag;
- ✦ Take off disposable coveralls and boot covers, turn inside out, and place into 200um polythene sealable bag (RPE must still be worn);
- ✦ Use damp cloths to wipe down footwear and place cloths into 200um polythene sealable bag;
- ✦ Place the damp cloth into 200um polythene sealable bag;
- ✦ Use damp cloth to wipe external surfaces of respirator;
- ✦ Place the damp cloth into 200um polythene sealable bag;
- ✦ Seal 200um polythene sealable bag with duct tape and place each into a second 200um polythene sealable bag marked as 'Asbestos Waste';
- ✦ Seal second 200um polythene sealable bag with duct tape;
- ✦ Remove mask / respirator and place in sealable bag / container; and
- ✦ Wash with soap and water (Particular attention should be paid to the hands, fingernails, face and head).

Once the test pitting works have been completed at a location, the catchment layer under the decontamination station is to be rolled / folded up and sealed in a clean layer of **200µm** polythene sheeting, secured with adhesive tape applied to the entire length of every overlap, to encapsulate the contaminated material.

### 17.2 – Vehicle & Plant Decontamination

The decontamination zone shall be maintained at the edge of the exclusion zone. The decontamination zone shall consist of a decontamination station maintained on a catchment layer consisting of geofabric. The following decontamination procedure shall be implemented at all times for vehicles / plant when leaving the exclusion zone:

- ✦ Vehicles / plant shall be inspected on the geofabric catchment layer;
- ✦ The inspection of plant shall include tracks, underbody and attachments;
- ✦ The inspection of vehicles shall include tyres / wheels, mudflaps and underbody; and
- ✦ Should potentially contaminated material be identified it shall be removed using dry cleaning techniques (brush).

Once the test pitting works have been completed at a location, the catchment layer under the decontamination station is to be rolled / folded up and sealed in a clean layer of **200µm** polythene sheeting, secured with adhesive tape applied to the entire length of every overlap, to encapsulate the contaminated material.

### 18 – Clearance Certificates

Exclusion zones shall remain in place until a visual clearance inspection has been completed by the SQP / LAA.

The SQP / LAA shall issue a Clearance Certificate at the end of each day of works.

### 19 – Waste Disposal

The removal of waste material is not required as the concrete waste is remaining on site to be managed by others, and the contaminated soil shall be backfilled into each test pit excavation on completion of the investigations at each location.

The Synergy Project Supervisor shall dispose of the 200um polythene sealable bags marked as 'Asbestos Waste' that contain soiled PPE, and other items from the decontamination process, at a suitably licenced waste facility.

#### 20 - Validation Reporting

Synergy understands that Nation Partners shall performing the necessary analytical sampling and validation reporting.

▪ ACT  
6 BARRON STREET  
DEAKIN ACT 2600

▪ NSW  
1/2 FORGE PLACE  
NARELLAN NSW 2567

▪ QLD  
SUITE 2, LEVEL 2, 64 MARINE PARADE  
SOUTHPORT QLD 4215

▪ TAS  
LEVEL 1, 99 LIVERPOOL STREET  
HOBART TAS 7000

▪ NT  
32 HAZELL COURT  
COCONUT GROVE NT 0810

## Appendix 1

7 September 2023

**Jacob Barnes**

Synergy Resource Management Pty Ltd  
Unit 1, 2 Forge Pl  
Narellan NSW 2567

**Chatswood Metro – Mowbray Road and Pacific Highway – Site Soils Contamination Summary**

Dear Jacob,

Nation Partners Pty Ltd (Nation Partners) has been engaged by Sydney Metro to conduct a Pre-Remediation Investigation at the Chatswood Metro site located at the north-east corner of the Pacific Highway and Mowbray Road, Chatswood, New South Wales (NSW) (the site). The location and boundary of the site are shown on **Figure 1**.

Nation Partners has subcontracted scope elements to Synergy Resource Management Pty Ltd (Synergy) including the physical ground disturbance works, provision of an occupational hygienist, and conducting asbestos air monitoring.

As part of this engagement Synergy have asked Nation Partners to provide a statement on the asbestos contamination at the Site to use as an attachment for a SafeWork notification, which is the subject of this letter.

This letter has considered the following previous investigations:

- GHD Pty Ltd (GHD), 2020, *Sydney Metro, Chatswood Metro, Corner of Pacific Highway and Mowbray Road, Chatswood, Contamination Summary Report* (GHD, 2020).
- Nation Partners, 2021, *Sydney Metro Chatswood Site – Data Gap Investigation Report Chatswood Site* (Nation Partners, 2021).

**Summary of Asbestos Contamination**

A review of the soil results from GHD (2020) and Nation Partners (2021) indicated the following asbestos based contamination at the site, as shown on Figure 1:

- **Historic asbestos burial pits:** two burial pits are known to be present, based on previous reports (shown on Figure 1). The pits are associated with previous remediation works of the Former Caltex service station and Master Lease Property (MLP) site. Petroleum hydrocarbon impacted soil was land-farmed and retained on-site in the pits. During the remediation works, asbestos containing material (ACM) in the form of bonded ACM sheet fragments was observed in soils. These soils were also retained within the burial pits. Therefore, the material within these pits is preliminarily classified as GSW-asbestos.
- **Potential asbestos slab:** previous reports indicate the potential presence of an asbestos slab, shown on Figure 1. The slab and surrounding soils (nominally 0.2 m) are preliminary classified as GSW-asbestos.
- **Wide-spread asbestos:** ACM has previously been reported to be present in fill soils at the site, however the entire site has not been investigated in a sufficient manner to determine the potential wide-spread presence of ACM.

**Melbourne office**  
Level 3, The Alley  
75-77 Flinders Lane  
Melbourne VIC 3000

**Sydney office**  
Suite 306  
50 Holt Street  
Surry Hills NSW 2010

**Canberra office**  
WOTSO Woden  
Level 2, 7 Neptune Street  
Woden ACT 2606

**T** 1300 876 976  
**E** info@nationpartners.com.au  
**W** nationpartners.com.au

- A fragment of bonded ACM containing chrysotile asbestos at location BH27 at a depth of approximately 0.8 mBGL.
- During investigations conducted to date, all asbestos encountered has been bonded ACM, no friable asbestos or asbestos fines have been identified at the site.

### Next Steps

Nation Partners will undertake the following next steps:

- Conduct a Pre-remediation Delineation Investigation to determine the potential wide-spread presence of ACM.
- The investigation will be conducted with Synergy undertaking the testpitting and occupational hygienist roles, with Nation Partners observing and conducting soil sampling to better characterise the site.

Sincerely,

**Bradley Coates**  
Senior Consultant

**Liam Gooley**  
Principal

I acknowledge the Traditional Custodians of the land on which I work and live, and recognise their continuing connection to land, water, and community. I pay my respects to Elders past, present and emerging.





## **Figures**

1 – Site location

2 – Site features, impacted soil and sampling locations

## **Attachments**

- Limitations



**Figure 1: Site Location**

*Chatswood Pre-Remediation Investigation Sampling Analysis and Quality Plan*

**Legend**

 Site Boundary

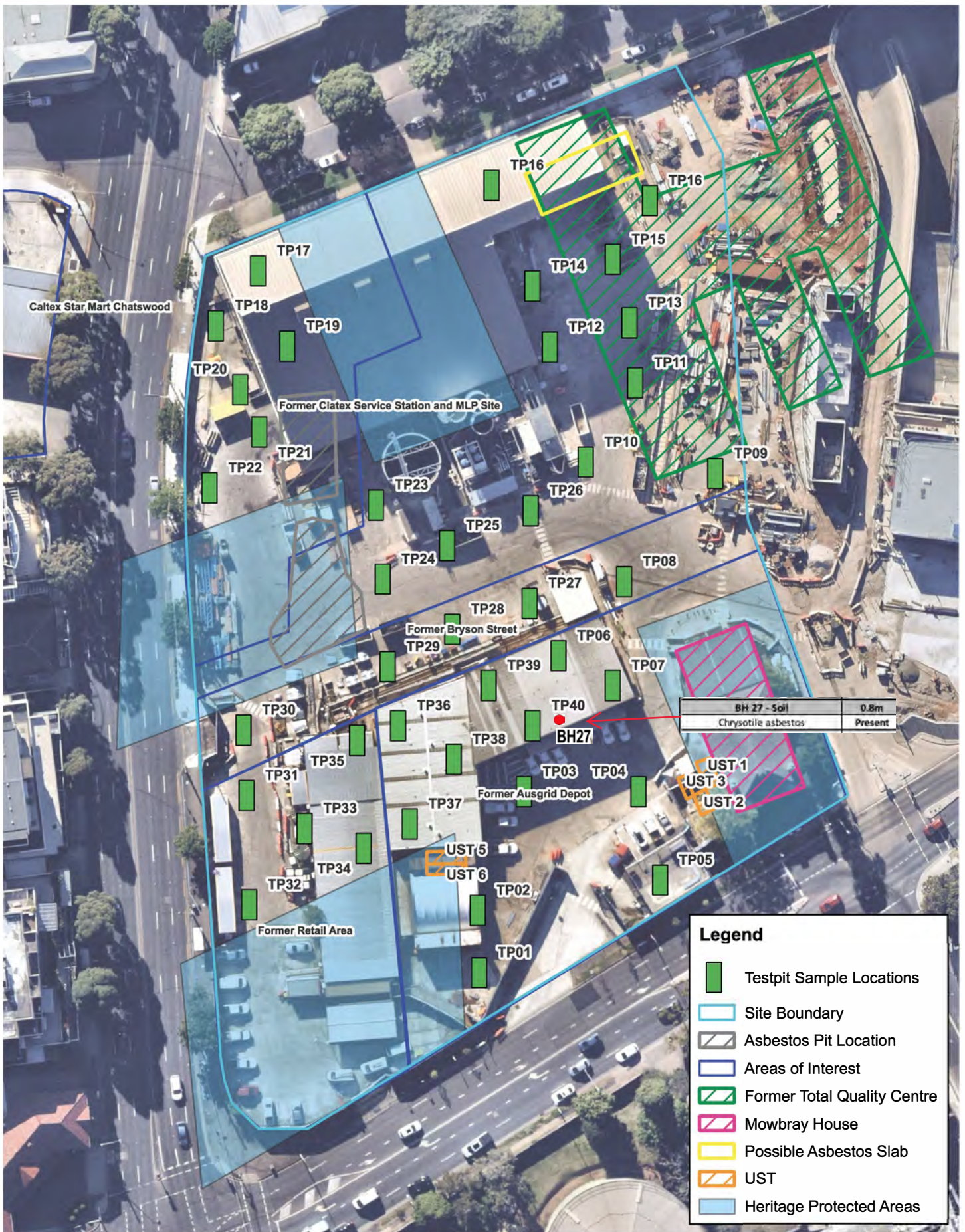


DATA SOURCE  
Imagery: Nearmap, 2023



**nation  
partners**

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**Figure 2: Previous Soil Sampling Locations**

Chatswood Pre-Remediation Investigation  
Sampling Analysis and Quality Plan

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DATA SOURCE  
Imagery: Nearmap, 2023

SCALE  
0 10 20 30 m



nation  
partners



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## Appendix 2



# FRIABLE ASBESTOS REMOVAL LICENCE

Issued under the *Work Health and Safety Regulation 2011 (NSW)*. This licence is not transferable.

**Licence:** AD213682

**Licence period:** From: 06/07/2021 To: 05/07/2026

**Licence holder name:** Synergy Resource Management Pty Ltd

**ABN:** 57 120 757 299

**ACN:** 120 757 299

**Address:** UNIT 1 2 FORGE PLACE  
NARELLAN NSW 2567

## Description of the work that can be undertaken under this licence

- All friable asbestos removal work
- All non-friable asbestos removal work

### Licence holder obligations

A nominated supervisor must be present at the site whenever licenced friable asbestos removal work is being carried out and readily available to attend the site when licenced non friable asbestos removal work is carried out.

This licence must be available for inspections at all times.

All licenced asbestos removal work is to be notified to SafeWork NSW at least five days prior to the work commencing.

The licence holder must notify SafeWork NSW in writing of any changes to the licence or supervisor details within 14 days.

## Appendix 3

# Notice of intent to remove non-friable asbestos

Notification number: 940R-00389075-01      Date of notice: 7/09/2023      Notification status: Acknowledged

## LICENCE DETAILS

Asbestos removal licence number: 213682      Expiry date: 5/07/2026  
Licence holder name: Synergy Resource Management Pty Ltd  
Class(es): Class A / ASA/ Class B / ASB  
Registered business name: Synergy Resource Management Pty Ltd  
A.B.N: 57120757299  
Daytime contact number: 0434516017

## WORK/ SITE DETAILS

Proposed work start date: 18/09/2023      Proposed work finish date: 27/11/2023  
Site name: Chatswood Dive Site  
Site address: 255 Mowbray Road Chatswood NSW 2067  
Site owner: Sydney Metro      Telephone:  
Approximate quantity of asbestos: 80  
(square metres)  
Detail location of asbestos on site: Numerous Test Pitting Locations As Per The Contamination Memo Attached  
Details of removal including Fencing, Barriers, Signage, Water, 200 µm plastic,  
method used to enclose the removal area:

## CLEARANCE CERTIFICATE PROVIDER

Competent person:      Telephone:  
Licensed asbestos assessor: Justin Walker      Number: LAA001353      Telephone: 0466 650 243

## SUPERVISOR/ WORKER DETAILS

Number of workers for this removal work: 3  
Number of workers who have successfully completed relevant competency unit: 3

Supervisor	DOB	Competency	Telephone
MR David John Webster	06/05/1965	ASA	0403 432 074

All work is to be carried out in accordance with the *Work Health and Safety Regulation 2017* and the associated codes of practice. This notification to remove asbestos is required by clause 466 of the *Work Health and Safety Regulation 2017*. See Section 268 of the *Work Health and Safety Act 2011* for offences relating to the giving of false or misleading information under the Act or the Regulation.



## Appendix 4

# SYN24 Site Induction Record

**Jay Bonnor**  
 Created Fri, 01 Sep 2023, 1:34 PM (UTC+10)

Project:

Name:

Employer:

Date of Birth:		Address:	
Phone Number:		Medical conditions, allergies or medications which may affect ability to perform work:	
Name of Emergency Contact Person:		Phone Number of Emergency Contact:	

Photo of WHS Construction Induction White Card

Photo of Drivers License

Photo's of required licenses, certificates, and / or VOC's

Tick 'Yes' to confirm that you have been advised of and understand the following:

1.	Responsibilities and Accountabilities	-
2.	Site access / egress and parking arrangements	-
3.	Traffic management (on-site and off-site)	-
4.	Site security and work area exclusion zones	-
5.	Site facilities	-
6.	General Site Rules	-
7.	Alcohol and non-prescription drugs are strictly prohibited	-
8.	Safety hazard / environmental aspect identification, risk / impact management processes and ESWMS	-
9.	Safety hazard, environmental aspect and quality non-conformance reporting	-
10.	Consultation arrangements (Weekly toolbox talk and daily pre-start meetings)	-
11.	First aid staff and equipment	-
12.	Emergency contact details for project stakeholders	-
13.	Emergency meeting point and emergency response procedures	-
14.	Hospital location map for emergencies	-
15.	Fire extinguisher types and locations	-
16.	Spill kit types and locations	-

17.	Only undertake activities in which you are licensed and / or trained / competent	-
18.	Electrical tool safety (Testing / tagging, RCD, repairs completed by electrician)	-
19.	Hazardous Substances, Dangerous Goods and Safety Data Sheets (SDS)	-
20.	Project and task specific PPE requirements	-
20.	Overhead and underground services	-
21.	Mobile plant safety (Competent operators, pre-start checks, flashing light and reverse alarm, exclusion zones)	-
22.	Site specific hazards and control measures (Hazardous materials, demolition, mobile plant)	-
23.	Contaminants of concern at the site, the potential exposure pathways and the necessary control measures	-
24.	Mobile phone and personal music device use	-
25.	Non-conforming plant, equipment, materials and / or products	-
26.	Community liaisons and complaints	-
27.	Stockpile management	-
28.	Waste management	-
29.	Erosion and sediment control	-
30.	Noise and air pollution	-
31.	Site specific information not listed above	-

**Participant's Signature:** Not signed yet.

**Scan Sitemate ID**

Name	Company	Signature	Date	Time	Location
There are no signatures to display yet.					

**Delivered by:** Not signed yet.

Template Rev.9 - 11.07.22

## Appendix 5

# SYN08 Pre-Start Meeting Record

**Jay Bonnor**  
 Created Fri, 01 Sep 2023, 1:31 PM (UTC+10)

Project:

Date: -

Presenter Name:

## Issues Discussed & Comments:

Record and discuss the day's work activities:

Record and discuss who will be performing these activities:

Photos:

Select and discuss the major hazards / environmental aspects / quality control issues associated with the activities:

Record any other discussions: (E.g. Client Instructions, UHF Channel / Site Communications, Exclusion Zones, Weather Forecast etc.)

Confirm that ESWMS are available which cover the safety hazards / environmental aspects / quality control requirements identified above

-

Comments:

Confirm that the intended work methods and control measures conform with those identified in the ESWMS.

-

Comments:

Confirm that the ESWMS have been signed-off by the appropriate workers

-

Comments:

Confirm that pre-start safety checks will be completed for all plant and equipment intended for use.

-

Comments:

Discuss potential hazards arising from interaction with other trades or general public.

-

Comments:

Discuss weather conditions and related site hazards.

-

Comments:

Confirm that all personnel have the correct PPE and it is in good working order.

-

Comments:

### Participant Sign On

Name	Company	Signature	Date	Time	Location
There are no signatures to display yet.					

**Manual Sign On**

Not signed yet.

---


Template Rev.4 - 08.09.20

DASHPIVOT TEMPLATE

## Appendix 6

# ESWMS01 General Site Activities

**Jay Bonnor**  
Created Thu, 07 Sep 2023, 9:02 AM (UTC+10)

Task / Activity:	Principal Contractor:	Revision:	Date:	Prepared By:	Name & Position:	Signature:
General Site Activities	Nation Partners	0	07/09/2023	Synergy Resource Management 1/2 Forge Place, Narellan. NSW 2567 ABN: 57 120 757 299	Ian Warren - EHSQ Manager	

ESWMS Implemented By:	Supervisor Competency:	Workers Consulted:	Reviewed By:
Adam Webster - Senior Project Supervisor	3+ years of project supervisory experience	Kursley Deau - Project Operations Paul Dilevski - Senior Plant Operator	Jacob Barnes - Project Manager

Compliance Obligations:	Work Permit / Licences Required:	Worker Licences / Qualifications / Training / Competencies Required:	Subcontracted Works:
NSW Work Health & Safety Act 2011, NSW Work Health & Safety Regulation 2017, Protection of the Environment Operations Act 1997 (NSW), Code of practice: How to Safely Remove Asbestos, NSW How to Manage & Control Asbestos in the Workplace COP 2022	N/A	Activities to be coordinated by licenced Asbestos Removal Supervisor, Workers undertaking asbestos removal work to hold Class B (Bonded) Asbestos Removal Work Unit of Competency, Site personnel must have current RIW card and have completed all associated Systems Connect & Nation Partners inductions, have a current OHS Induction for Construction Card, complete a Synergy site induction, sign on to relevant ESWMS, & attend the daily pre-start meeting prior to commencing works.	N/A

**High Risk Work Activities:**

Disturbance to Asbestos   Contaminated or Flammable Atmospheres   Powered Mobile Plant

**PPE Required:**

Coveralls   Ear Protection   Eye Protection   Hand Protection   Hard Hat   High Vis (Shirt / Jacket / Vest)   Other   Respirator / Dust Mask   Safety Footwear

**Note:**

Refer to controls for additional task specific PPE requirements



Plant / Equipment Required:	Plant / Equipment Checks Required:	Hazardous Substances / Dangerous Goods Required:	Risk Assessment & Safety Data Sheet Available:
Refer to task specific ESWMS	Refer to task specific ESWMS	Refer to task specific ESWMS	Refer to task specific ESWMS

**Risk Matrix:** The Risk Matrix below is used to assess the probability and the severity of a safety hazard / environmental aspect, resulting in a priority rating being assigned on the basis of risk / impact. Risk / Impact Ratings are as follows: 1 – 6 = Extreme, 7 – 11 = High, 12 - 17 = Medium & 18 - 25 = Low.

		Probability				
		A	B	C	D	E
Severity	V	1	3	6	10	15
	W	2	5	9	14	19
	X	4	8	11	17	22
	Y	7	13	16	21	24
	Z	12	18	20	23	25

Probability	Severity	
	For People	For Environment
A = Almost Certain (Expected in most circumstances)	V = Severe (Death or permanent disability)	V = Severe (Permanent impact)
B = Likely (Probably occur in most circumstances)	W = Major (Hospital admission required)	W = Major (Long term impact)
C = Possible (Could occur sometime)	X = Moderate (Medical Treatment Required)	X = Moderate (Medium term impact)
D = Unlikely (Not likely to occur in normal circumstances)	Y = Minor (First aid treatment required)	Y = Minor (Short term impact)
E = Rare (May occur in exceptional circumstances)	Z = Insignificant (No injury)	Z = Insignificant (No impact)

**Notes:** ESWMS are communicated to workers during the Synergy site induction process. Regular inspections are to be performed to confirm that the work activities reflect the prescribed controls. If an inaccuracy is identified with the ESWMS the document shall be amended, in consultation with the workers, with all personnel re-trained in the revised requirements during a Toolbox Talk Meeting.

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations	New workers to site	Lack of information / training	11	<ul style="list-style-type: none"> <li>All site personnel must have current RIW card and have completed all associated Systems Connect &amp; Nation Partners inductions,</li> <li>All site personnel must have a current OHS Induction for Construction Card (white card)</li> <li>All site personnel must complete a Synergy site induction,</li> <li>All site personnel must sign on to relevant ESWMS, &amp; attend the daily pre-start meeting prior to commencing works.</li> </ul>	SRM Project Supervisor	22

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
				<ul style="list-style-type: none"> <li>All workers must attend the daily pre-start meeting</li> <li>All workers must adhere to Systems Connect &amp; Nation Partners site rules</li> <li>All workers must comply with the applicable ESWMS</li> </ul>	Individual Workers	
	Working in asbestos contaminated areas	Inhalation of asbestos fibres	3	<ul style="list-style-type: none"> <li>Airborne fibre monitoring shall be conducted at 8 locations around the site and in the work areas to assess the effectiveness of the controls in place</li> <li>Where elevated concentration is identified (&gt;0.01f/ml), works shall halt &amp; the control measures reviewed</li> <li>Occupational hygienist to perform clearance inspection &amp; issue a Clearance Certificate on completion of each work area.</li> <li>Ensure all personnel are made aware of the asbestos hazards &amp; control measures during site induction process &amp; daily pre-start meetings</li> <li>All personnel to be appropriately trained &amp; competent</li> <li>Install 'Danger – Asbestos' warning signage in suitable locations</li> <li>Install exclusion zone around the asbestos removal area using bollards / high visibility barrier tape or star pickets / barrier mesh fencing</li> <li>Install &amp; maintain decontamination station</li> <li>All personnel to be trained in the decontamination procedure</li> <li>All personnel to be trained in the correct use, storage &amp; disposal of PPE</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
			3	<ul style="list-style-type: none"> <li>• All personnel to wear disposable coveralls, safety gumboots, nitrile gloves under general purpose gloves &amp; respirator with P2 filters before entering &amp; at all times when in the exclusion zone</li> <li>• Minimise dust generating activities where practicable</li> <li>• Suppress dust by watering with hose where required</li> <li>• Follow decontamination procedure when leaving contaminated area:               <ul style="list-style-type: none"> <li>- Remove any visible dust / residue from protective clothing using an asbestos vacuum cleaner or wiping down with damp cloths (Do not reuse cloths).</li> <li>- Place cloths into disposal plastic bags (200µm thick).</li> <li>- Take disposable coveralls off &amp; place into disposal bags</li> <li>- Use damp cloths to wipe down footwear &amp; place cloths into disposal bag.</li> <li>- Use damp cloth to wipe external surfaces of respirator.</li> <li>- Place the damp cloth into disposable bags.</li> <li>- Remove respirator &amp; place in sealable bag / container.</li> <li>- Wash with soap and water (Particular attention should be paid to the hands, fingernails, face, and head).</li> </ul> </li> <li>• Apply fine water mist spray to the suspected asbestos in a manner that ensures the entire surface is saturated, but run-off minimised</li> <li>• Plant to be decontaminated at the end of the asbestos removal &amp; screening activities or before leaving the exclusion zone</li> </ul>	Individual Workers	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations	UV Radiation	Sun Burn, Melanoma	9	<ul style="list-style-type: none"> <li>Discuss the forecast temperature and Ultraviolet Radiation (UVR) index during the pre-start meeting and site-specific control measures identified</li> <li>Utilising shaded areas including the erection of temporary shade where practicable</li> <li>Providing workers with protection against ultraviolet exposure, such as broad brimmed hats, hard hat brim, safety sunglasses, loose fitting long-sleeved collared (preferably cotton) shirt, and sunscreen</li> </ul>	SRM Project Supervisor	19
				<ul style="list-style-type: none"> <li>Wear appropriate PPE for the conditions</li> <li>Apply 40+ UPF sunscreen on all exposed skin and regularly re-apply</li> </ul>	Individual Workers	
	Extreme Heat	Dehydration, heat stroke, fatigue	3	<ul style="list-style-type: none"> <li>Monitor weekly weather forecasts to plan key activities which have the potential for workers to be exposed to high temperature, e.g., concreting, steel fixing, manual labour, manual demolition etc.</li> <li>Rescheduling work so that physically demanding tasks are performed during the cooler parts of the day</li> <li>Reducing the duration of physically demanding work tasks with job rotation</li> <li>Provide extra rest breaks in a cool area</li> <li>Providing water and encourage water consumption</li> <li>Use of mechanical aids to reduce physical exertion</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations				<ul style="list-style-type: none"> <li>Be aware of the symptoms and early warning signs of heat related illness and notify the Synergy Project Supervisor if you are feeling any of the following; high body temp, hot or red skin, headache, dizziness, nausea, confusion, heavy sweating, weakness, muscle cramps or pain, and anything else you may be concerned about.</li> </ul>	Individual Workers	
	Road Traffic	Persons struck by passing vehicle	2	<ul style="list-style-type: none"> <li>Works to be completed under all associated site traffic management requirements from Systems Connect personnel.</li> </ul>	SRM Project Supervisor	11
				<ul style="list-style-type: none"> <li>Wear high vis. garment</li> <li>Maintain exclusion zones from road traffic</li> <li>Follow guidance from traffic control personnel</li> <li>Concentrate on task &amp; do not use mobile phone</li> </ul>	Individual Workers	
	Site Traffic	Vehicle collision	9	<ul style="list-style-type: none"> <li>Comply with site specific traffic controls</li> <li>Observe site speed limits</li> <li>Adhere to all traffic signals and signs</li> </ul>	SRM Project Supervisor	19

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations	Noise	Noise disturbance to sensitive receivers in vicinity	13	<ul style="list-style-type: none"> <li>Working hours restricted to 7.00am - 5.00pm Monday to Friday, with no works permitted on Saturdays, Sundays, or Public Holidays</li> <li>Ensure that appropriate noise restricting devices are fitted &amp; functioning correctly on all vehicles, plant &amp; equipment</li> <li>Operate vehicles, plant &amp; equipment in a manner that does not generate unnecessary noise, such as avoiding excessive engine revving etc.</li> <li>Vehicles, plant &amp; equipment to be turned off when not in use</li> <li>Vehicles, plant &amp; equipment shall be maintained regularly &amp; serviced as per manufacturer's specifications</li> </ul>	SRM Project Supervisor	24
		Hearing damage	14	<ul style="list-style-type: none"> <li>Wear hearing protection in accordance with plant manufacturer guidelines</li> </ul>	Individual Worker	19

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
	Electrical power tools	Electric shock/ electrocution	6	<ul style="list-style-type: none"> <li>All electrical tools to have current test tag.</li> <li>All electrical tools to be tested &amp; tagged 3 monthly.</li> <li>Defective electrical tools to be withdrawn from service immediately with an 'Out of Service' tag attached &amp; the Project Supervisor notified.</li> <li>All repairs to electrical equipment to be completed by a licensed electrician.</li> <li>All operators of electrical tools to be trained &amp; competent.</li> <li>Use battery operated electrical tools where available.</li> <li>All non-battery operated electrical tools to be run through a safety cut-out switch (RCD).</li> <li>Complete visual pre-start safety check of electrical tools before operation &amp; regularly during period of extended use.</li> <li>Use the correct tool for the task.</li> <li>Use electrical tools in accordance with the manufacturer guidelines.</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
	Miscellaneous Hand Tools	Lacerations, abrasions, puncture wounds etc	9	<ul style="list-style-type: none"> <li>Identify and assess the risk before using any type of hand tools that have the potential to cause injuries such as lacerations, abrasions, puncture wounds etc,</li> <li>Follow risk assessment procedures to eliminate the requirement of using potentially hazardous hand tools all together, and identify safer, alternative tasks / activities to complete the work, where practicable;</li> <li>Select the correct hand tool for the task;</li> <li>Ensure hand tools are maintained, in good working order, and in a safe condition for use;</li> <li>Keep the hand not holding the tool, and other body parts, away from the cutting area;</li> <li>Ensure the correct PPE for the task is being utilised;</li> <li>Ensure all associated guards or other safety devices of the tool are fitted / functioning correctly;</li> <li>Ensure tool blades are retracted or stored in protective cover / sheath when not in use;</li> <li>Never modify hand tools from the original manufacturers design; and</li> <li>If in doubt, stop the task / activity and seek further advice from your Project Supervisor / Manager;</li> </ul>	Individual Workers	24
	Manual Handling, Lifting	Musculoskeletal injury	3	<ul style="list-style-type: none"> <li>All workers to be trained in correct manual handling &amp; lifting techniques (refer to lifting technique diagram below)</li> <li>Encourage all workers to warm up and stretch before starting work</li> </ul>	SRM Project Supervisor	15



Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations				<ul style="list-style-type: none"> <li>• Utilise mechanical aid to minimise manual handling (vehicle, plant, barrow etc.)</li> <li>• Estimate the weight of the load and assess the shape. Where possible, divide the load into smaller and easy to manage loads</li> <li>• Plan the lift;</li> <li>• Access to destination</li> </ul> <ul style="list-style-type: none"> <li>- Route to be taken</li> <li>- Grip used</li> <li>- Posture for lifting</li> <li>- Balanced stance</li> <li>- Appropriate PPE               <ul style="list-style-type: none"> <li>• Utilise a second person to assist where possible</li> <li>• Wear appropriate PPE for specific tasks</li> <li>• Never twist the body whilst lifting and carrying a load</li> </ul> </li> </ul>	Individual Workers	



Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations	Manual Handling, Pushing & Pulling	Musculoskeletal injury, slips trips & falls	3	<ul style="list-style-type: none"> <li>• Push rather than pull the item</li> <li>• Do not pull large loads towards yourself</li> <li>• Do not jerk the item to get it moving</li> <li>• Seek assistance if the load is too heavy to push or pull, break down the load, if possible</li> <li>• Never try to move or push a loaded aid or skid by hand</li> <li>• Use correct lifting techniques when loading and unloading</li> <li>• When traveling down an incline, don't pull</li> <li>• Ensure regular maintenance and inspections of equipment used to transport items is carried out to keep them operating safely and correctly</li> <li>• Keep travel routes clear of debris and maintain good housekeeping practices</li> </ul>	Individual Workers	15
	Hazardous Substances / Dangerous Goods (HS&DG)	Inhalation, ingestion or dermal absorption of HS	6	<ul style="list-style-type: none"> <li>• All HS&amp;DG on site to be recorded on the Chemical Register</li> <li>• Ensure SDS for all HS&amp;DG is readily available</li> </ul>	SRM Project Supervisor	15
				<ul style="list-style-type: none"> <li>• Handling &amp; storage of HS&amp;DG to be in accordance with SDS</li> <li>• Keep containers closed when not in use</li> <li>• Ensure that all storage containers are clearly labelled</li> <li>• Work in a well-ventilated area when handling HS&amp;DG</li> <li>• Avoid breathing of vapours, mists or sprays</li> <li>• Remove &amp; replace clothing affected by spillages</li> <li>• Wash hands before eating, drinking or going to the toilet</li> </ul>	Individual Workers	

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
All site operations		Fire / explosion	6	<ul style="list-style-type: none"> <li>Ensure that DG stored together are compatible</li> <li>Do not store DG near naked flames</li> </ul>	SRM Project Supervisor	15
				<ul style="list-style-type: none"> <li>No smoking in the vicinity of DG storage or handling operations</li> </ul>	Individual Workers	
		Leak or spill of HS&DG causing pollution event	11	<ul style="list-style-type: none"> <li>Use non-HS&amp;DG where practicable</li> <li>Minimise the quantity of HS&amp;DG on site</li> <li>Provide suitable HS&amp;DG storage in accordance with SDS</li> <li>Supply &amp; maintain a spill response kit at the fuel / chemical storage area in the Synergy compound</li> <li>Supply &amp; maintain a portable spill response for remote activities with the potential for spill / leak situations</li> </ul>	SRM Project Supervisor	22
				<ul style="list-style-type: none"> <li>Maintain a suitable spill kit in vicinity of handling &amp; storage locations</li> </ul>	Individual Workers	
	Snakes / Spiders	Venomous bite	3	<ul style="list-style-type: none"> <li>Snake / spider hazards identified to workers during the site induction process</li> <li>Add snake / spider bite supplementary first aid supplies to first aid kit</li> </ul>	SRM Project Supervisor	15
				<ul style="list-style-type: none"> <li>Stop work and advise other workers in the area if you see a snake / spider, and move away from the work area until safe to return</li> <li>Do not approach the snake / spider</li> <li>Watch where you step and where you sit when outdoors</li> <li>Wear ankle-high leather safety footwear, where practicable</li> </ul>	Individual Workers	

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All site operations	Heavy, large or awkward load	Musculoskeletal injury	16	<ul style="list-style-type: none"> <li>Utilise mechanical aid to minimise manual handling (vehicle, plant, barrow etc.)</li> <li>Split into smaller / lighter more manageable loads</li> <li>Use correct lifting technique (Keep back straight and bend the knees)</li> </ul>	Individual Workers	24
	Erosion & sedimentation	Soil erosion, contamination of stormwater system or local waterway	13	<ul style="list-style-type: none"> <li>Keep amount of water used for dust suppression to a minimum in order to prevent run-off</li> <li>Sediment filters to be installed on all existing kerb inlets Stormwater drainage inlets located within work area &amp; in vicinity of the Site to be protected with sediment traps</li> </ul>	SRM Project Supervisor	20
All site operations	Air Quality	Dust	13	<ul style="list-style-type: none"> <li>Minimising the area of disturbance to that required to facilitate the works</li> <li>Regularly assessing the weather conditions and temporarily ceasing materials handling operations during periods of unsuitable weather such as high winds</li> <li>Minimise the height of stockpiles materials to minimise the potential for wind erosion</li> <li>Perform dust suppression through the application of water sprays / mists during materials handling operations and on transport routes within the Site</li> <li>Tyne smooth surfaces to reduce wind velocity at the soil surface</li> <li>Restrict vehicles to the designated traffic routes within the Site</li> <li>Limit vehicles speeds on the Site to 20km/h</li> <li>All vehicles entering &amp; exiting the Site must have their loads covered</li> </ul>	SRM Project Supervisor	20

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
		Emissions	13	<ul style="list-style-type: none"> <li>Exhaust system mufflers to be fitted and functioning correctly on all plant / equipment</li> <li>Drivers / operators to be instructed to operate plant / equipment in a manner that avoids excessive engine revving</li> <li>Limiting vehicles speeds on the Site to 20km/h</li> <li>Plant / equipment to be turned off when not in use</li> <li>Plant / equipment to be maintained regularly and serviced as per the manufacturer's specifications</li> </ul>	SRM Project Supervisor	20
	Cultural heritage	Damage to sites / items of indigenous / historic cultural significance	14	<ul style="list-style-type: none"> <li>In the unlikely event that potential objects or places of indigenous / historic cultural heritage significance are identified during the Works, activities shall cease immediately with advice sought from the Principal's project representative in accordance with the Synergy <i>Unexpected Findings Protocol</i></li> </ul>	SRM Project Supervisor	19

**Dynamic Hazard / Aspect Identification & Risk / Impact Assessment:**

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating

**ESWMS Review & Revision:**

Synergy shall review this ESWMS, in consultation with workers undertaking the activities concerned, under the following circumstances:

- Synergy shall review this ESWMS, in consultation with workers undertaking the activities concerned, under the following circumstances;
- When deficiencies are identified during the completion of the ESWMS Review Report;
- When there has been failure in the control measures resulting in an injury, illness, near miss or environmental incident;
- Following a previously unidentified hazard / aspect being identified during a pre-start meeting, toolbox talk, site safety inspections; audit or hazard / aspect reporting process;
- Following a previously unidentified hazard / aspect being identified through relevant industry material, regulator advice, or interested party information;
- Following new products, services and processes or changes to existing products, services, and processes, including:
  - Workplace locations and surroundings;
  - Work organisation;
  - Working conditions;
  - Tools, plant, equipment, products and / or materials;
  - Workforce;
  - Scope of works or intended work methods;
- Following changes to applicable compliance obligations and other requirements;
- Following changes in knowledge and / or information regarding hazards / aspects and risks / impacts;
- Developments in knowledge and / or technology; and
- Following changes to the company policy statements.

**Record of Review & Revision:**

Date:	Completed By:	Signature:	Authorised By (PCBU Representative):	Signature:	Description of Amendments: (List New Revision Number / Date If Applicable):

**ESWMS Sign-Off:**

I acknowledge that the relevant aspects of the ESWMS's have been explained to me and that the requirements are understood, by providing my signature below.

**Scan Sitemate ID**


Name	Company	Signature	Date	Time	Location
There are no signatures to display yet.					

**Signature:** Not signed yet.



# ESWMS08 Electrical Tool Operation - Miscellaneous Tasks

**Jay Bonnor**  
Created Thu, 07 Sep 2023, 9:05 AM (UTC+10)

Task / Activity:	Principal Contractor:	Revision:	Date:	Prepared By:	Name & Position:	Signature:
Electrical Tool Operation - Miscellaneous Tasks	Nation Partners	0	07/09/2023	Synergy Resource Management 1/2 Forge Place, Narellan. NSW 2567 ABN: 57 120 757 299	Ian Warren - EHSQ Manager	

ESWMS Implemented By:	Supervisor Competency:	Workers Consulted:	Reviewed By:
Adam Webster - Senior Project Supervisor	3+ years of project supervisory experience	Kursley Deau - Project Operations Paul Dilevski - Senior Plant Operator	Jacob Barnes - Project Manager

Compliance Obligations:	Work Permit / Licences Required:	Worker Licences / Qualifications / Training / Competencies Required:	Subcontracted Works:
NSW Work Health & Safety Act 2011, NSW Work Health & Safety Regulation 2017, Managing Risks of Plant COP 2019, Construction Work COP 2019, Hazardous Manual Tasks COP 2019, Managing Electrical Risks in the Workplace COP 2019	N/A	Tool operators to be trained & competent, Site personnel must have current RIW card and have completed all associated Systems Connect & Nation Partners inductions, have a current OHS Induction for Construction Card, complete a Synergy site induction, sign on to relevant ESWMS, & attend the daily pre-start meeting prior to commencing works.	N/A

**High Risk Work Activities:**

**PPE Required:**

Ear Protection   Eye Protection   Hand Protection   Hard Hat   High Vis (Shirt / Jacket / Vest)   Other   Safety Footwear

**Note:**

Refer to controls for additional task specific PPE requirements

Plant / Equipment Required:	Plant / Equipment Checks Required:	Hazardous Substances / Dangerous Goods Required:	Risk Assessment & Safety Data Sheet Available:
Drill, Grinder, Circular Saw, Reciprocating Saw, Drop Saw etc.	Electrical plant & equipment to be tested & tagged	N/A	N/A

**Risk Matrix:** The Risk Matrix below is used to assess the probability and the severity of a safety hazard / environmental aspect, resulting in a priority rating being assigned on the basis of risk / impact. Risk / Impact Ratings are as follows: 1 – 6 = Extreme, 7 – 11 = High, 12 - 17 = Medium & 18 - 25 = Low.

		Probability					Severity			
		A	B	C	D	E	For People		For Environment	
Severity	V	1	3	6	10	15	A = Almost Certain (Expected in most circumstances)		V = Severe (Death or permanent disability)	V = Severe (Permanent impact)
	W	2	5	9	14	19	B = Likely (Probably occur in most circumstances)		W = Major (Hospital admission required)	W = Major (Long term impact)
	X	4	8	11	17	22	C = Possible (Could occur sometime)		X = Moderate (Medical Treatment Required)	X = Moderate (Medium term impact)
	Y	7	13	16	21	24	D = Unlikely (Not likely to occur in normal circumstances)		Y = Minor (First aid treatment required)	Y = Minor (Short term impact)
	Z	12	18	20	23	25	E = Rare (May occur in exceptional circumstances)		Z = Insignificant (No injury)	Z = Insignificant (No impact)

**Notes:** ESWMS are communicated to workers during the Synergy site induction process. Regular inspections are to be performed to confirm that the work activities reflect the prescribed controls. If an inaccuracy is identified with the ESWMS the document shall be amended, in consultation with the workers, with all personnel re-trained in the revised requirements during a Toolbox Talk Meeting.

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Transporting tools & equipment	Heavy / awkward load	Musculoskeletal injury	21	<ul style="list-style-type: none"> <li>Use vehicle to transport plant where practicable</li> <li>Unload items as close to desired location as practicable</li> <li>Warm up &amp; stretch before starting operations</li> <li>Split item into smaller, lighter &amp; more manageable loads</li> <li>Use group lifting technique</li> <li>Use correct lifting technique (Keep back straight and bend the knees)</li> <li>Wear suitable safety footwear</li> </ul>	Individual Workers	25
Operate miscellaneous electrical tool (Drill, Grinder, Circular Saw, Reciprocating Saw, Drop Saw etc.)	Operating plant	Plant failure or in unsafe condition	3	<ul style="list-style-type: none"> <li>Electrical plant &amp; equipment is to be tested &amp; tagged and recorded in Electrical Register</li> <li>Operators of electrical tools to be trained &amp; competent</li> <li>All repairs to electrical equipment to be completed by a licensed electrician</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
			3	<ul style="list-style-type: none"> <li>• Correct storage of tools</li> <li>• Complete pre-start safety check of tool &amp; lead before operation</li> <li>• Defective tools to be tagged 'Out of Service' &amp; supervisor notified</li> <li>• PPE to comply with project requirements</li> </ul>	Individual Workers	15
	Electricity	Electric shock / Electrocutation	3	<ul style="list-style-type: none"> <li>• Use battery operated tools where available / practicable</li> <li>• Remove battery from work tool when not in use</li> <li>• All mains operated tools to be run through a portable RCD (Safety Switch) unit</li> <li>• Keep all tools, plugs &amp; leads away from water</li> <li>• Keep leads away from the work area &amp; elevated on insulated hooks or stands</li> <li>• Suspend leads approx. 2.4m off the ground where practicable</li> <li>• 25m maximum length of leads permitted</li> </ul>	Individual Workers	15
	Noise	Hearing damage	9	<ul style="list-style-type: none"> <li>• Wear hearing protection to comply with manufacturers requirements</li> </ul>	Individual Workers	19
	Dust	Respiratory damage	9	<ul style="list-style-type: none"> <li>• Work in a well ventilate area where practicable</li> <li>• Utilise vacuum attachment where practicable</li> <li>• Wear P2 dust mask / respirator with P2 filter during operations with the potential to generate dust</li> </ul>	Individual Workers	19

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
	Hot plant components or work piece	Burns	5	<ul style="list-style-type: none"> <li>• Ensure all guards are fitted &amp; functioning correctly</li> <li>• Do not touch potentially hot plant components or work piece until they have had time to cool after operations</li> </ul>	Individual Workers	19
	Slips, trips & falls	Musculoskeletal injury	21	<ul style="list-style-type: none"> <li>• Wear suitable safety footwear</li> <li>• Remove hazards / obstacles from work area before commencing works where practicable</li> <li>• Keep work area tidy &amp; equipment / tools together when not in use</li> <li>• Elevate leads where required</li> <li>• Regularly collect &amp; dispose of waste</li> </ul>	Individual Workers	24

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
	Sharp / rotating parts	Caught in machine workings	11	<ul style="list-style-type: none"> <li>• Select the correct tool for the task</li> <li>• Ensure all guards &amp; other safety mechanisms are fitted &amp; functioning correctly</li> <li>• Ensure tool is in locked mode prior to inserting battery</li> <li>• Insert blade before inserting battery</li> <li>• Only insert blade into tool just prior to use</li> <li>• Tie long hair back &amp; remove / replace any loose clothing or jewelry that may get caught in machine workings</li> <li>• Adhere to plant warning / safety stickers &amp; notices</li> <li>• Use head torch or mobile light to illuminate the work piece &amp; tool if natural / artificial lighting is insufficient</li> <li>• Keep the hand not holding the tool away from the bit / attachment / blade etc during operation</li> <li>• Where there is the potential risk of entanglement, the use of gloves shall be deemed task specific</li> <li>• Operate the tool safely &amp; correctly in the manner it was designed for</li> </ul>	Individual Workers	22
		Lacerations	2	<ul style="list-style-type: none"> <li>• 9" (230mm) grinders not permitted for use</li> <li>• Use the correct tool for the task / activity</li> <li>• Ensure all guards are fitted &amp; functioning correctly</li> <li>• Adhere to plant warning / safety notices</li> <li>• Stop works immediately &amp; turn off plant if a fault is identified</li> <li>• Use 2 hands when practical</li> </ul>	Individual Workers	19

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
	Flying debris	Eye damage	9	<ul style="list-style-type: none"> <li>Ensure all guards are fitted and functioning correctly</li> <li>Wear eye protection (Safety glasses or face shield)</li> </ul>	Individual Workers	19
	Dropping the tool or work piece	Musculoskeletal injury	21	<ul style="list-style-type: none"> <li>Wear suitable safety footwear</li> <li>Use correct lifting technique</li> <li>Use group lifting technique for large / heavy / awkward items</li> <li>Ensure that the work piece is secure before commencing works</li> </ul>	Individual Workers	24

**Dynamic Hazard / Aspect Identification & Risk / Impact Assessment:**

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating

**ESWMS Review & Revision:**

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- When deficiencies are identified during the completion of the ESWMS Review Report;
- When there has been failure in the control measures resulting in an injury, illness, near miss or environmental incident;
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- Following a previously unidentified hazard / aspect being identified through relevant industry material, regulator advice, or interested party information;
- Following new products, services and processes or changes to existing products, services, and processes, including:
  - Workplace locations and surroundings;
  - Work organisation;
  - Working conditions;
  - Tools, plant, equipment, products and / or materials;
  - Workforce;
  - Scope of works or intended work methods;
- Following changes to applicable compliance obligations and other requirements;
- Following changes in knowledge and / or information regarding hazards / aspects and risks / impacts;
- Developments in knowledge and / or technology; and
- Following changes to the company policy statements.

**Record of Review & Revision:**

Date:	Completed By:	Signature:	Authorised By (PCBU Representative):	Signature:	Description of Amendments: (List New Revision Number / Date If Applicable):

**ESWMS Sign-Off:**

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**Scan Sitemate ID**


Name	Company	Signature	Date	Time	Location
There are no signatures to display yet.					

**Signature:** Not signed yet.



# ESWMS10 Plant & Equipment Refuelling, Greasing & Oiling

**Jay Bonnor**  
Created Thu, 07 Sep 2023, 9:06 AM (UTC+10)

Task / Activity:	Principal Contractor:	Revision:	Date:	Prepared By:	Name & Position:	Signature:
Plant & Equipment Refuelling, Greasing & Oiling	Nation Partners	0	07/09/2023	Synergy Resource Management 1/2 Forge Place, Narellan. NSW 2567 ABN: 57 120 757 299	Ian Warren - EHSQ Manager	

ESWMS Implemented By:	Supervisor Competency:	Workers Consulted:	Reviewed By:
Adam Webster - Senior Project Supervisor	3+ years of project supervisory experience	Kursley Deau - Project Operations Paul Dilevski - Senior Plant Operator	Jacob Barnes - Project Manager

Compliance Obligations:	Work Permit / Licences Required:	Worker Licences / Qualifications / Training / Competencies Required:	Subcontracted Works:
NSW Work Health & Safety Act 2011, NSW Work Health & Safety Regulation 2017, Managing Risks of Plant COP 2019, NSW Hazardous Manual Tasks COP 2019	N/A	Plant operators to be trained & competent, Site personnel must have current RIW card and have completed all associated Systems Connect & Nation Partners inductions, have a current OHS Induction for Construction Card, complete a Synergy site induction, sign on to relevant ESWMS, & attend the daily pre-start meeting prior to commencing works.	N/A

**High Risk Work Activities:** Contaminated or Flammable Atmospheres Powered Mobile Plant

**PPE Required:** Eye Protection Hand Protection Hard Hat High Vis (Shirt / Jacket / Vest) Other Safety Footwear

**Note:**  
Refer to controls for additional task specific PPE requirements

Plant / Equipment Required:	Plant / Equipment Checks Required:	Hazardous Substances / Dangerous Goods Required:	Risk Assessment & Safety Data Sheet Available:
A: B: E Fire Extinguisher, funnel, pouring tube or hose	Plant pre-start safety checks completed daily	Petrol, Diesel, Oil, Grease	Yes

**Risk Matrix:** The Risk Matrix below is used to assess the probability and the severity of a safety hazard / environmental aspect, resulting in a priority rating being assigned on the basis of risk / impact. Risk / Impact Ratings are as follows: 1 – 6 = Extreme, 7 – 11 = High, 12 - 17 = Medium & 18 - 25 = Low.

		Probability				
		A	B	C	D	E
Severity	V	1	3	6	10	15
	W	2	5	9	14	19
	X	4	8	11	17	22
	Y	7	13	16	21	24
	Z	12	18	20	23	25

Probability	Severity	
	For People	For Environment
A = Almost Certain (Expected in most circumstances)	V = Severe (Death or permanent disability)	V = Severe (Permanent impact)
B = Likely (Probably occur in most circumstances)	W = Major (Hospital admission required)	W = Major (Long term impact)
C = Possible (Could occur sometime)	X = Moderate (Medical Treatment Required)	X = Moderate (Medium term impact)
D = Unlikely (Not likely to occur in normal circumstances)	Y = Minor (First aid treatment required)	Y = Minor (Short term impact)
E = Rare (May occur in exceptional circumstances)	Z = Insignificant (No injury)	Z = Insignificant (No impact)

**Notes:** ESWMS are communicated to workers during the Synergy site induction process. Regular inspections are to be performed to confirm that the work activities reflect the prescribed controls. If an inaccuracy is identified with the ESWMS the document shall be amended, in consultation with the workers, with all personnel re-trained in the revised requirements during a Toolbox Talk Meeting.

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
Transport fuel to plant / equipment for refuelling	Vehicle movement	Road traffic accident	6	<ul style="list-style-type: none"> <li>All vehicle movements to comply with the requirements of the site Construction Traffic &amp; Pedestrian Management Plan</li> </ul>	SRM Project Supervisor	15
			6	<ul style="list-style-type: none"> <li>Follow all instructions from traffic controllers</li> <li>Stay on approved access / haul roads &amp; parking areas unless otherwise directed</li> <li>Do not exceed the site speed limit</li> <li>Vehicles to have flashing light, reverse alarms &amp; UHF radio operational</li> </ul>	Driver	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
		Persons struck by vehicle	6	<ul style="list-style-type: none"> <li>Use a spotter to help guide the driver when reversing</li> <li>Remain at least 10m from truck when in operation</li> <li>Remain in view of the driver where practicable</li> <li>Do not position yourself between any operating vehicles &amp; fixed objects</li> <li>Wear high vis. garment</li> </ul>	Individual Workers	15
	Manual handling / heavy awkward items	Musculoskeletal injury	8	<ul style="list-style-type: none"> <li>Use mechanical aids such as a trolley or wheelbarrow to transport fuel jerry cans</li> <li>Use correct lifting techniques</li> <li>Operators of tools &amp; equipment to be trained &amp; competent</li> <li>Warm up and stretch prior to undertaking manual handling tasks</li> <li>Ask for assistance if required</li> </ul>	SRM Project Supervisor	22
Access plant fuel source or fuel cell	Hot engine / exhaust components	Burns	11	<ul style="list-style-type: none"> <li>Turn-off plant / equipment &amp; allow to cool before commencing refuelling operations where practicable</li> <li>Familiarise yourself with the potentially hot engine / exhaust components before commencing operations</li> <li>Wear appropriate PPE such as gloves when handling potentially hot components</li> </ul>	Individual Workers	22

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Refuelling plant	Hazardous Substance & Dangerous Goods (HS&DG)	Inhalation, ingestion or absorption of fuel	9	<ul style="list-style-type: none"> <li>Follow handling &amp; storage guidelines in SDS</li> <li>Work in a well-ventilated area</li> <li>Avoid breathing of vapours, mists or sprays</li> <li>Use suitable funnel, pouring tube or hose</li> <li>Remove &amp; replace clothing affected by spillages</li> <li>Wear suitable gloves throughout operations</li> <li>Wash hands before eating, drinking or going to the toilet</li> </ul>	Individual Workers	19
		Fire or explosion	6	<ul style="list-style-type: none"> <li>Keep A: B: E fire extinguisher readily available</li> <li>Fire extinguisher to be tested &amp; tagged</li> <li>Follow handling &amp; storage guidelines in SDS</li> <li>Do not perform refuelling operations near sources of ignition</li> <li>Refuelling area should be open with adequate ventilation</li> <li>No smoking in refuelling area</li> </ul>	Individual Workers	15
	Leaks & spills	Contamination of soils, groundwater or waterway	11	<ul style="list-style-type: none"> <li>Utilise designated refuelling contractor if servicing the site where practicable</li> <li>Persons to be trained &amp; competent</li> </ul>	SRM Project Supervisor	22
			11	<ul style="list-style-type: none"> <li>Refuelling operations are to be supervised by persons operating the fuel line at all times and under no circumstances shall refuelling operations be left unattended</li> <li>Refuelling to take place on hard stand where practicable</li> <li>Follow handling &amp; storage guidelines in SDS</li> <li>Keep spill kit readily available</li> <li>Use suitable funnel, pouring tube or hose</li> </ul>	Individual Workers	22

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
Storage of fuels, grease & oils etc.	Hazardous Substance & Dangerous Goods (HS&DG)	Fire or explosion	6	<ul style="list-style-type: none"> <li>HS&amp;DG to be stored in accordance with the SDS</li> <li>HS&amp;DG to be stored away from potential sources of ignition</li> <li>Ensure appropriate and adequate warning signs / labels are displayed as per SDS</li> <li>Confirm the compatibility of HS&amp;DG when stored together</li> </ul>	SRM Project Supervisor	15
			6	<ul style="list-style-type: none"> <li>No smoking or hot works are permitted near storage areas</li> </ul>	Individual Workers	15
	Leaks & spills	Contamination of soils, groundwater or waterway	11	<ul style="list-style-type: none"> <li>Minimise quantities of HS&amp;DG stored on site</li> <li>Store HS&amp;DG in suitable containers</li> <li>HS&amp;DG storage containers to have bunded floor or drip trays</li> <li>Ensure SDS for HS&amp;DG are readily available</li> <li>Maintain suitable spill kit in vicinity of HS&amp;DG storage locations</li> </ul>	SRM Project Supervisor	22
			11	<ul style="list-style-type: none"> <li>Ensure HS&amp;DG storage containers are clearly labelled</li> </ul>	Individual Workers	22

**Dynamic Hazard / Aspect Identification & Risk / Impact Assessment:**

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating

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**Record of Review & Revision:**

Date:	Completed By:	Signature:	Authorised By (PCBU Representative):	Signature:	Description of Amendments: (List New Revision Number / Date If Applicable):

**ESWMS Sign-Off:**

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**Scan Sitemate ID**

Name	Company	Signature	Date	Time	Location
There are no signatures to display yet.					

**Signature:** Not signed yet.

# ESWMS14 Tipper Truck Operation

**Jay Bonnor**  
Created Thu, 07 Sep 2023, 9:07 AM (UTC+10)

Task / Activity:	Principal Contractor:	Revision:	Date:	Prepared By:	Name & Position:	Signature:
Tipper Truck Operation	Nation Partners	0	07/09/2023	Synergy Resource Management 1/2 Forge Place, Narellan. NSW 2567 ABN: 57 120 757 299	Ian Warren - EHSQ Manager	

ESWMS Implemented By:	Supervisor Competency:	Workers Consulted:	Reviewed By:
Adam Webster - Senior Project Supervisor	3+ years of project supervisory experience	Kursley Deau - Project Operations Paul Dilevski - Senior Plant Operator	Jacob Barnes - Project Manager

Compliance Obligations:	Work Permit / Licences Required:	Worker Licences / Qualifications / Training / Competencies Required:	Subcontracted Works:
NSW Work Health & Safety Act 2011, NSW Work Health & Safety Regulation 2017, Managing Risks of Plant COP 2019, Heavy Vehicle (Adoption of National Law) Act 2013, Heavy Vehicle (Adoption of National Law) Regulation 2013	N/A	Driver to have the appropriate Drivers Licence for vehicle class. Site personnel must have current RIW card and have completed all associated Systems Connect & Nation Partners inductions, have a current OHS Induction for Construction Card, complete a Synergy site induction, sign on to relevant ESWMS, & attend the daily pre-start meeting prior to commencing works.	N/A

**High Risk Work Activities:**

Powered Mobile Plant

**PPE Required:**

Hard Hat High Vis (Shirt / Jacket / Vest) Safety Footwear Other

**Note:**

Refer to controls for additional task specific PPE requirements



Plant / Equipment Required:	Plant / Equipment Checks Required:	Hazardous Substances / Dangerous Goods Required:	Risk Assessment & Safety Data Sheet Available:
Tipper Truck	Plant pre-start safety checks completed daily	N/A	N/A

**Risk Matrix:** The Risk Matrix below is used to assess the probability and the severity of a safety hazard / environmental aspect, resulting in a priority rating being assigned on the basis of risk / impact. Risk / Impact Ratings are as follows: 1 – 6 = Extreme, 7 – 11 = High, 12 - 17 = Medium & 18 - 25 = Low.

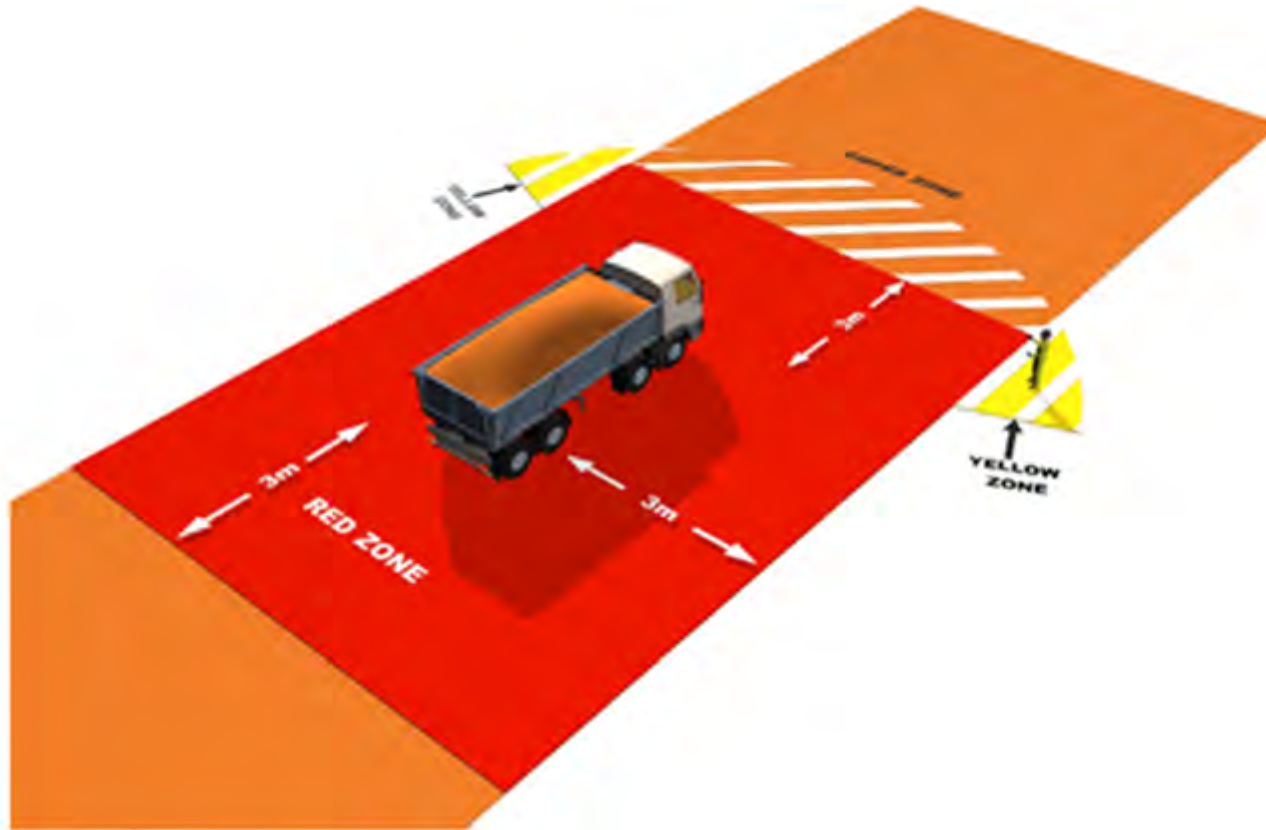
Severity	Probability				
	A	B	C	D	E
V	1	3	6	10	15
W	2	5	9	14	19
X	4	8	11	17	22
Y	7	13	16	21	24
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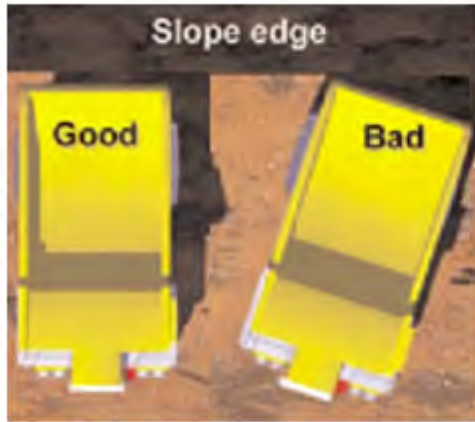
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Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Tipper truck operation	Operating vehicles	Driver competency	3	<ul style="list-style-type: none"> <li>Driver to have the appropriate Drivers Licence for vehicle class</li> </ul>	SRM Project Supervisor	15
		Persons struck by vehicle	6	<ul style="list-style-type: none"> <li>Install physical exclusion zone to separate people &amp; plant where practicable</li> <li>All drivers to be trained &amp; competent</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
			6	<ul style="list-style-type: none"> <li>• Driver to face in the direction of travel where practicable</li> <li>• Ensure flashing light &amp; reverse alarm are operational</li> <li>• Do not use mobile phone during while in control of vehicle</li> <li>• Use 2-way radio for positive contact between workers &amp; drivers</li> <li>• Stop works &amp; isolate vehicle immediately if persons enter the Amber plant interface zone without positive contact prior</li> <li>• Stop works &amp; isolate vehicle immediately if persons enter Red plant interface zone</li> </ul>	Operator	15
			6	<ul style="list-style-type: none"> <li>• Wear hard hat &amp; high visibility garment (jacket, shirt, vest)</li> <li>• The following plant interface zone controls must be observed (refer to diagram below)</li> </ul> <p>Yellow Zone - All personnel involved with the plant operation must remain within this zone to maintain visual contact with the driver</p> <p>Amber Zone - Entry prohibited until positive visual contact is made with the driver prior</p> <p>Red Zone - Entry prohibited unless the vehicle is completely isolated, immobilised &amp; the engine switched off</p>	Individual Workers	15



Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Tipper truck operation	Operating vehicles	Vehicle roll-over	3	<ul style="list-style-type: none"> <li>• Do not drive on gradients steeper than those approved by manufacturer (Refer to Operators Manual);</li> <li>• Do not exceed the vehicles Safe Workload Limit (SWL)</li> <li>• Minimise travel direction changes when driving on a slope</li> <li>• Drive slowly when approaching or driving down slope</li> <li>• Ensure the load is distributed evenly</li> <li>• Maintain a safe distance from excavations, steep gradients &amp; previously dumped / stockpiled material</li> <li>• Do not drive vehicle with the trailer in the vertical discharge position</li> <li>• Drive at appropriate speeds for the site conditions</li> <li>• Maintain a safe working distance from excavations / batters etc.;</li> <li>• Avoid slopes across the direction of travel where practicable</li> <li>• Wear seatbelt restraint</li> <li>• Position the vehicle at a right angle to the tipping face / slope edge before unloading, where applicable (refer to diagram below)</li> <li>• Only load / unload on suitably level and compacted ground (refer to diagram below)</li> </ul>	Driver	15



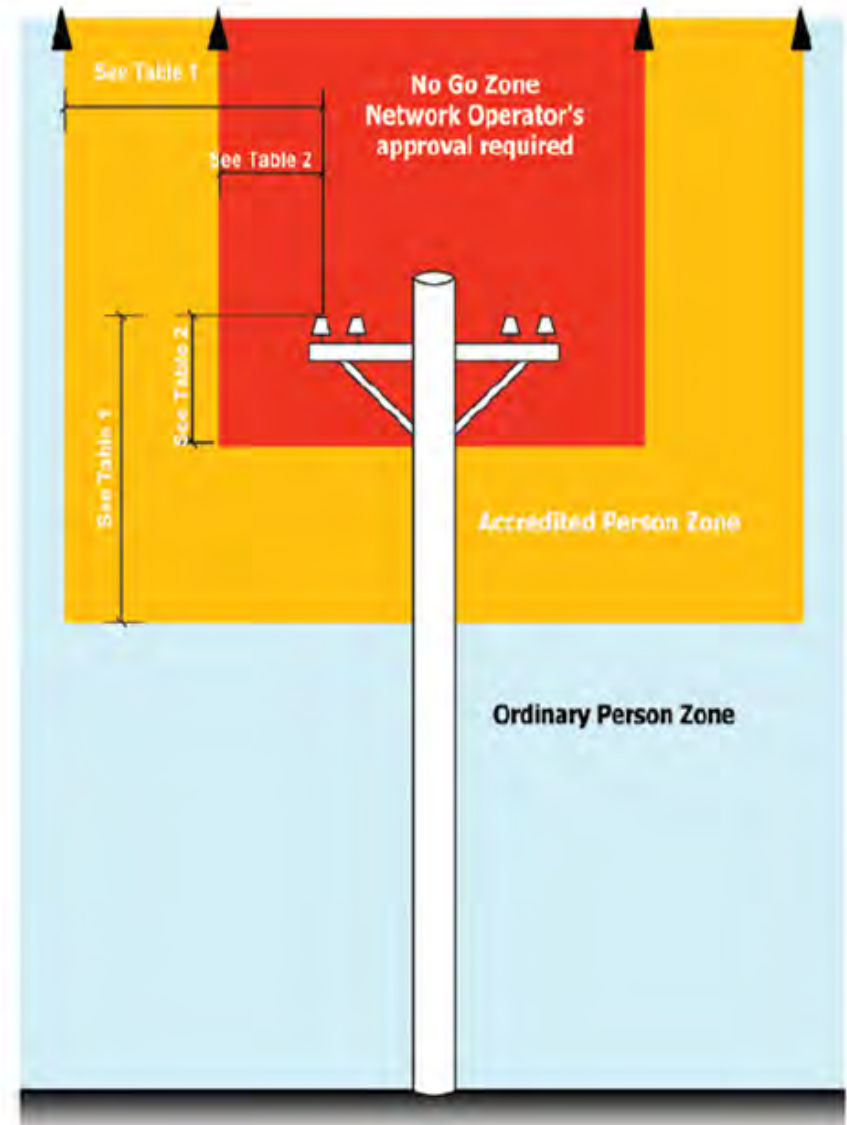
Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Tipper truck operation	Operating vehicles	Vehicle failure or in unsafe condition	10	<ul style="list-style-type: none"> <li>Ensure vehicle is suitable for task, terrain &amp; site conditions</li> <li>Vehicle to be inspected, serviced &amp; maintained as per manufacturer's instructions</li> </ul>	SRM Project Supervisor	15
			10	<ul style="list-style-type: none"> <li>Operation of the vehicle must follow the manufacturer's instructions / guidelines</li> <li>Complete daily pre-start safety checks</li> <li>Faulty or damaged vehicles must be tagged 'Out of Service' and reported immediately to the Synergy Project Supervisor</li> <li>All servicing &amp; repairs must be completed by a competent person</li> </ul>	Driver	15
	Overhead services	Electric shock or electrocution	3	<ul style="list-style-type: none"> <li>Inspect the work area on foot to identify overhead services hazards before entering with the machine</li> <li>The specified approach distances must be maintained (refer to information below)</li> <li>Use a spotter to guide plant operations near overhead services to ensure clearance distances are maintained</li> <li>Where the approved approach distances cannot be maintained the network operator shall be consulted regarding the proposed work &amp; compliance maintained with any conditions imposed by the network operator for the work</li> </ul>	Driver	15

**Approach distances for work performed by Ordinary Persons**

Nominal phase to phase a.c. voltage (volts)	Approach distance (m)
Up to and including 132,000	3.0
Above 132,000 up to and including 330,000	6.0
Above 330,000	8.0
Nominal pole to earth d.c. voltage (volts)	Approach distance (m)
Up to and including +/- 1500 Volts	3.0

**Approach Distances for work performed by Accredited Persons, with a Safety Observer**

Nominal phase to phase a.c. voltage (volts)	Approach distance (m)
Insulated low voltage cables up to 1000, including LV ABC	0.5
Un-insulated low voltage conductors up to 1000	1.0
Above 1000 up to and including 33,000	1.2
Above 33,000 up to and including 66,000	1.4
Above 66,000 up to and including 132,000	1.8
Above 132,000 up to and including 220,000	2.4
330,000	3.7
500,000	4.6
Nominal pole to earth d.c. voltage (volts)	Approach distance (m)
Up to +/- 1,500	1.0



Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
Tipper truck operation	Operating vehicles	Vehicle / plant collision	6	<ul style="list-style-type: none"> <li>Utilise a spotter to help guide the driver through the site</li> <li>The spotter must be positioned so that they can identify potential hazards for the driver while maintaining a safe working distance</li> <li>In addition to visual direction between the spotter &amp; driver 2-way radios should be utilised during the operations where practical</li> <li>Radios are to be utilised where line of site precludes other visual / verbal communication methods</li> <li>Travel in a forward direction where practicable</li> <li>Ensure reverse alarm &amp; flashing warning light are operational</li> <li>Do not use mobile phone while driving</li> <li>Wear seatbelt restraint while driving</li> </ul>	Driver	15

**Dynamic Hazard / Aspect Identification & Risk / Impact Assessment:**

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating



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  - Workplace locations and surroundings;
  - Work organisation;
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  - Tools, plant, equipment, products and / or materials;
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**Scan Sitemate ID**


Name	Company	Signature	Date	Time	Location
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**Signature:**

Not signed yet.

# ESWMS30 Test Pitting Operations

**Jay Bonnor**  
Created Thu, 07 Sep 2023, 9:09 AM (UTC+10)

Task / Activity:	Principal Contractor:	Revision:	Date:	Prepared By:	Name & Position:	Signature:
Test Pitting Operations	Nation Partners	0	07/09/2023	Synergy Resource Management 1/2 Forge Place, Narellan. NSW 2567 ABN: 57 120 757 299	Ian Warren - EHSQ Manager	

ESWMS Implemented By:	Supervisor Competency:	Workers Consulted:	Reviewed By:
Adam Webster - Senior Project Supervisor	3+ years of project supervisory experience	Kursley Deau - Project Operations Paul Dilevski - Senior Plant Operator	Jacob Barnes - Project Manager

Compliance Obligations:	Work Permit / Licences Required:	Worker Licences / Qualifications / Training / Competencies Required:	Subcontracted Works:
NSW Work Health & Safety Act 2011, NSW Work Health & Safety Regulation 2017, Managing Risks of Plant COP 2019, Excavation Work COP 2019, Work Near Overhead Power Lines COP 2006, Work Near Underground Assets - Guide 2007, NSW How to Safely Remove Asbestos COP 2019, NSW How to Manage & Control Asbestos in the Workplace COP 2022, NSW Managing Asbestos in or on Soil - Guide 2014	Activities to be coordinated by licenced Asbestos Removal Supervisor	Activities to be coordinated by licenced Asbestos Removal Supervisor, Workers undertaking asbestos removal work to hold Class B (Bonded) Asbestos Removal Work Unit of Competency, Site personnel must have current RIW card and have completed all associated Systems Connect & Nation Partners inductions, have a current OHS Induction for Construction Card, complete a Synergy site induction, sign on to relevant ESWMS, & attend the daily pre-start meeting prior to commencing works.	N/A

**High Risk Work Activities:**

Disturbance to Asbestos   Contaminated or Flammable Atmospheres   Powered Mobile Plant

**PPE Required:**

Coveralls   Ear Protection   Eye Protection   Hand Protection   Hard Hat   High Vis (Shirt / Jacket / Vest)   Other   Respirator / Dust Mask   Safety Footwear

**Note:**

Refer to controls for additional task specific PPE requirements

Plant / Equipment Required:	Plant / Equipment Checks Required:	Hazardous Substances / Dangerous Goods Required:	Risk Assessment & Safety Data Sheet Available:
Excavator with Hammer attachment, 200µm (minimum thickness) polythene sheeting, 200µm (minimum thickness) polythene sealable bags, adhesive tape, catchment layer	Plant pre-start safety checks completed daily	N/A	N/A

**Risk Matrix:** The Risk Matrix below is used to assess the probability and the severity of a safety hazard / environmental aspect, resulting in a priority rating being assigned on the basis of risk / impact. Risk / Impact Ratings are as follows: 1 – 6 = Extreme, 7 – 11 = High, 12 - 17 = Medium & 18 - 25 = Low.

Severity	Probability				
	A	B	C	D	E
	V	1	3	6	10
W	2	5	9	14	19
X	4	8	11	17	22
Y	7	13	16	21	24
Z	12	18	20	23	25

Probability	Severity	
	For People	For Environment
A = Almost Certain (Expected in most circumstances)	V = Severe (Death or permanent disability)	V = Severe (Permanent impact)
B = Likely (Probably occur in most circumstances)	W = Major (Hospital admission required)	W = Major (Long term impact)
C = Possible (Could occur sometime)	X = Moderate (Medical Treatment Required)	X = Moderate (Medium term impact)
D = Unlikely (Not likely to occur in normal circumstances)	Y = Minor (First aid treatment required)	Y = Minor (Short term impact)
E = Rare (May occur in exceptional circumstances)	Z = Insignificant (No injury)	Z = Insignificant (No impact)

**Notes:** ESWMS are communicated to workers during the Synergy site induction process. Regular inspections are to be performed to confirm that the work activities reflect the prescribed controls. If an inaccuracy is identified with the ESWMS the document shall be amended, in consultation with the workers, with all personnel re-trained in the revised requirements during a Toolbox Talk Meeting.

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Demolition of concrete hard stand with hammer attachment	Operating plant with hammer attachment	Flying debris	5	<ul style="list-style-type: none"> <li>All non-essential personnel to leave the work area</li> <li>Maintain exclusion zone</li> </ul>	SRM Project Supervisor	19
			5	<ul style="list-style-type: none"> <li>Break concrete with hammer attachment – NOT with toothed bucket</li> <li>Position hammer in upright position during operation to minimise flying debris</li> </ul>	Operator	19

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
		Dust	9	<ul style="list-style-type: none"> <li>Work area to be sprayed with hose as required to suppress dust</li> <li>Wear hearing protection whilst hammer is in operation</li> </ul>	Individual Workers	19
		Excessive noise	9	<ul style="list-style-type: none"> <li>Wear hearing protection whilst hammer is in operation</li> </ul>	Individual Workers	19
Excavation & handling of ACM	Asbestos in soils	Exposure to asbestos fibres	3	<ul style="list-style-type: none"> <li>Ensure all personnel are made aware of asbestos hazards &amp; necessary control measures required during the site induction process &amp; daily pre-start meetings</li> <li>Maintain exclusion zone for all non-essential personnel around the area where hazardous materials removal is taking place</li> <li>Install 'Danger – Asbestos' warning signage on exclusion zone boundary</li> <li>Install &amp; maintain decontamination station on geofabric catchment layer</li> <li>All personnel to be trained in the decontamination procedure</li> <li>All personnel supplied with &amp; trained in use, storage &amp; disposal of PPE</li> </ul>	Asbestos Removal Supervisor	15
			3	<ul style="list-style-type: none"> <li>All personnel to wear disposable coveralls, nitrile gloves &amp; respirator with P2 filters before entering &amp; at all times when in the exclusion zone</li> <li>Apply water mist/spray to the work area &amp; ACM contaminated material handling operations</li> </ul>	Individual Workers	15

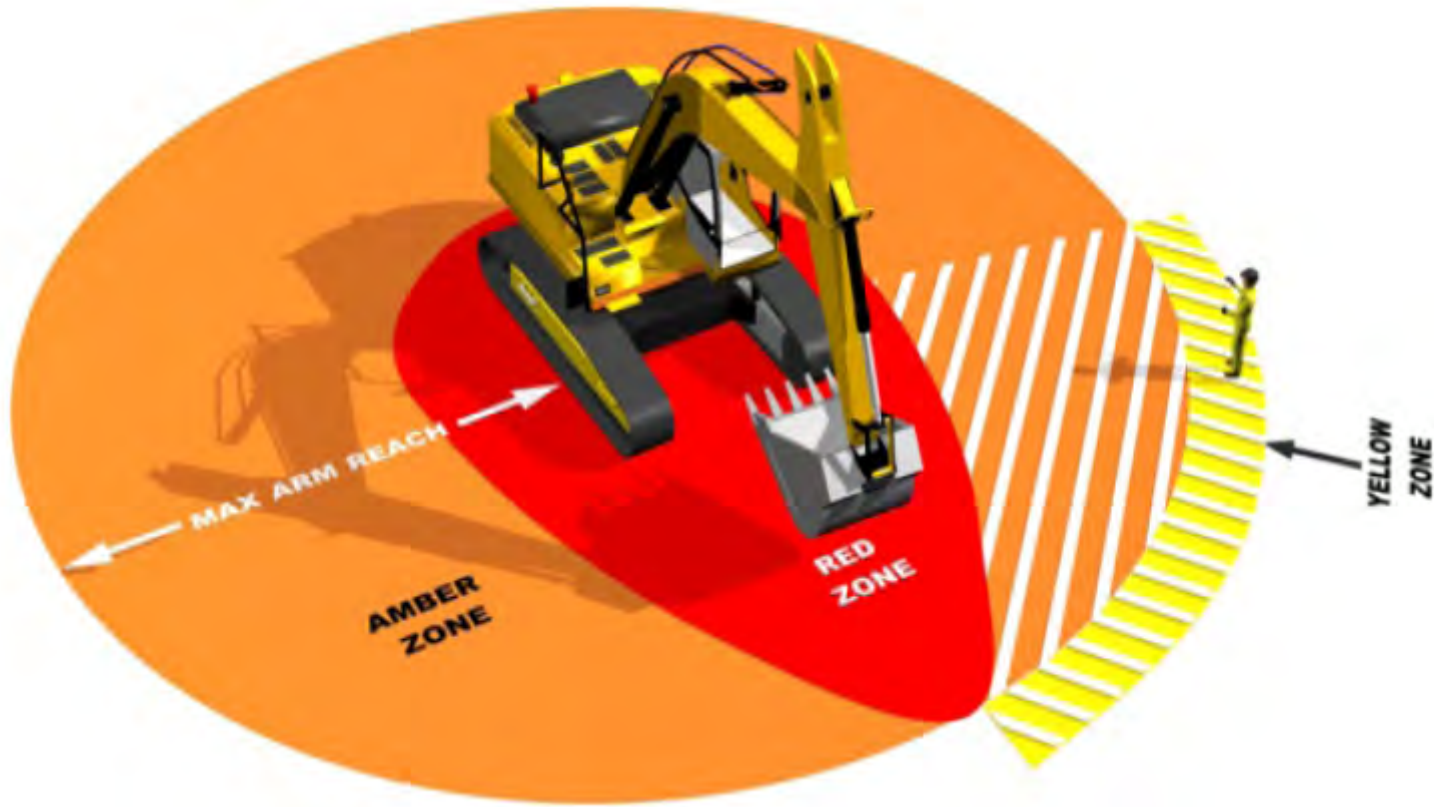
Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
			3	<ul style="list-style-type: none"> <li>• Driver / operator to remain in cabin when in the exclusion zone</li> <li>• Cabin windows to be closed &amp; air conditioner on recycle setting</li> </ul>	Operator	15
			3	Implement personal decontamination procedure when leaving exclusion zone: <ul style="list-style-type: none"> <li>• Enter decontamination area</li> <li>• Remove any visible asbestos dust / residue from protective clothing using a damp cloths. Do not reuse or resoak damp cloths</li> <li>• Place cloths into 200um polythene sealable bag</li> <li>• Take off disposable coveralls, turn inside out, &amp; place into 200um polythene sealable bag (RPE must still be worn)</li> <li>• Use damp cloths to wipe down footwear &amp; place cloths into 200um polythene sealable bag</li> <li>• Place the damp cloth into 200um polythene sealable bag</li> <li>• Use damp cloth to wipe external surfaces of respirator</li> <li>• Place the damp cloth into 200um polythene sealable bag</li> <li>• Seal 200um polythene sealable bag with duct tape &amp; place each into a second 200um polythene sealable bag marked as 'Asbestos Waste'</li> <li>• Seal second 200um polythene sealable bag with duct tape</li> <li>• Remove respirator &amp; place in sealable bag / container</li> </ul>	Individual Workers	151

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
			3	<ul style="list-style-type: none"> <li>Bags containing soiled PPE disposed of as 'Asbestos Waste'</li> </ul>	Asbestos Removal Supervisor	15
			3	Implement decontamination procedure for vehicles / plant when leaving exclusion zone: <ul style="list-style-type: none"> <li>Vehicles / plant to be inspected on the geofabric catchment layer</li> <li>The inspection of plant shall include tracks, underbody, and attachments</li> <li>The inspection of vehicles shall include tyres / wheels, mudflaps and underbody</li> <li>Should potentially contaminated material be identified it shall be removed using dry cleaning techniques (brush)</li> </ul>	Individual Workers	15
			3	<ul style="list-style-type: none"> <li>Geofabric catchment layer under the decontamination station is to be rolled / folded up and sealed in a clean layer of 200µm polythene sheeting, secured with adhesive tape applied to the entire length of every overlap</li> </ul>	Asbestos Removal Supervisor	15
			3	<ul style="list-style-type: none"> <li>Asbestos fibre air monitoring to be completed during operations to confirm the effectiveness of controls</li> <li>Should elevated concentrations be identified (&gt;0.01f/ml), works shall halt &amp; the control measures reviewed</li> <li>Licensed Asbestos Assessor to perform a clearance inspection &amp; issue a clearance certificate on satisfactory completion of the ACM removal works</li> </ul>	Licensed Asbestos Assessor	15
	Operating plant	Operator competency	3	<ul style="list-style-type: none"> <li>Operators to be trained &amp; competent</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
		Noise & vibration	16	<ul style="list-style-type: none"> <li>Exhaust system mufflers to be fitted and functioning correctly on all plant / vehicles</li> <li>Operate plant / vehicles in a manner that does not generate unnecessary noise, through avoiding excessive engine revving etc.</li> <li>Plant / equipment speeds to observe 10km/h speed limit on the site</li> <li>Plant / vehicles to be turned off when not in use</li> </ul>	Operator	24
		Dust	11	<ul style="list-style-type: none"> <li>Utilise the existing paved roadways through the Site for the access / egress of vehicles associated with the works</li> <li>Impose a 10km/h speed limit for vehicles on the Site</li> <li>Regularly dampen the roadways with a watercart</li> <li>Limiting ground disturbance to the immediate areas of the Site required to perform the remediation works</li> <li>Suppressing dust during materials handling operations with water spray / mist</li> <li>Temporarily cease materials handling operations during high-wind conditions</li> <li>Disturbed stockpiled materials being covered with plastic sheeting when access is not required</li> <li>Vehicles transporting materials from the Site to have sealed bodies and their loads covered</li> </ul>	SRM Project Supervisor	22
		Persons struck by plant	3	<ul style="list-style-type: none"> <li>Install physical exclusion zone to separate people &amp; plant where practicable</li> <li>All plant operators to be trained &amp; competent</li> </ul>	SRM Project Supervisor	15



Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
			3	<ul style="list-style-type: none"> <li>Operator to face in the direction of travel where practicable</li> <li>Ensure flashing light &amp; reverse alarm are operational</li> <li>Do not use mobile phone during plant operation</li> <li>Use 2-way radio for positive contact between workers &amp; operators</li> <li>Stop works &amp; isolate machine immediately if persons enter the Amber plant interface zone without positive contact prior</li> <li>Stop works &amp; isolate machine immediately if persons enter Red plant interface zone</li> </ul>	Operator	15
			3	<ul style="list-style-type: none"> <li>Wear hard hat &amp; high visibility garment (jacket, shirt, vest)</li> <li>The following plant interface zone controls must be observed (refer to diagram below)</li> </ul> <p>Yellow Zone - All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator</p> <p>Amber Zone - Entry prohibited until positive visual contact is made with the plant operator prior</p> <p>Red Zone - Entry prohibited unless the machine is completely isolated with the arm / boom / jib / attachment / load grounded, the machine immobilised &amp; the engine switched off.</p>	Individual Workers	15



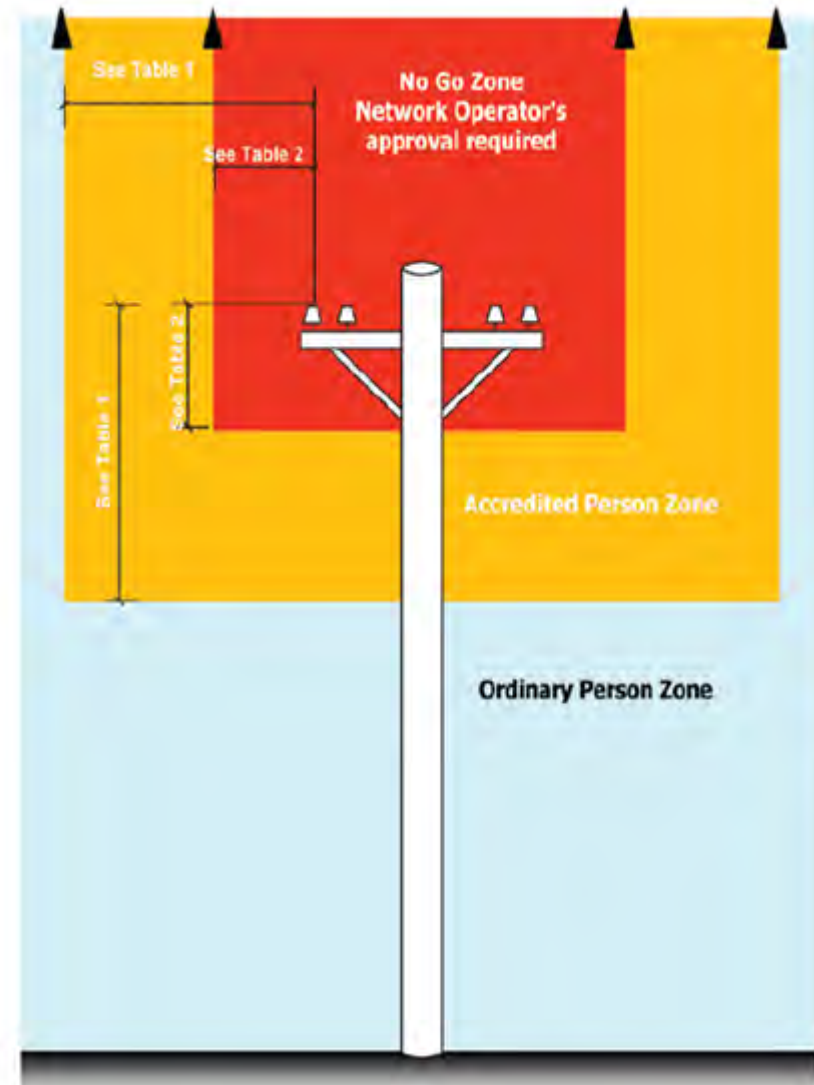
Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Excavation & handling of ACM	Underground infrastructure or services	Striking underground infrastructure or services	3	<ul style="list-style-type: none"> <li>Review Dial Before Your Dig Plans to identify underground services</li> <li>Engage professional utilities location contractor to perform subsurface screening using electronic detection equipment to pinpoint the location of underground services / infrastructure within work area</li> <li>Positively identify services within the excavation footprint prior to any works commencing</li> </ul>	SRM Project Supervisor	15
	Overhead services	Electric shock or electrocution	3	<ul style="list-style-type: none"> <li>Inspect the work area on foot to identify overhead services hazards before entering with the machine</li> <li>The specified approach distances must be maintained (refer to information below)</li> <li>Use a spotter to guide plant operations near overhead services to ensure clearance distances are maintained</li> <li>Where the approved approach distances cannot be maintained the network operator shall be consulted regarding the proposed work &amp; compliance maintained with any conditions imposed by the network operator for the work</li> </ul>	SRM Project Supervisor	15

**Approach distances for work performed by Ordinary Persons**

Nominal phase to phase a.c. voltage (volts)	Approach distance (m)
Up to and including 132,000	3.0
Above 132,000 up to and including 330,000	6.0
Above 330,000	8.0
Nominal pole to earth d.c. voltage (volts)	Approach distance (m)
Up to and including +/- 1500 Volts	3.0

**Approach Distances for work performed by Accredited Persons, with a Safety Observer**

Nominal phase to phase a.c. voltage (volts)	Approach distance (m)
Insulated low voltage cables up to 1000, including LV ABC	0.5
Un-insulated low voltage conductors up to 1000	1.0
Above 1000 up to and including 33,000	1.2
Above 33,000 up to and including 66,000	1.4
Above 66,000 up to and including 132,000	1.8
Above 132,000 up to and including 220,000	2.4
330,000	3.7
500,000	4.6
Nominal pole to earth d.c. voltage (volts)	Approach distance (m)
Up to +/- 1,500	1.0



Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
Excavation & handling of ACM	Operating plant	Plant collision	6	<ul style="list-style-type: none"> <li>All plant operators to be trained &amp; competent</li> </ul>	SRM Project Supervisor	15
			6	<ul style="list-style-type: none"> <li>Operator to face in the direction of travel where practicable</li> <li>Ensure reverse alarm &amp; flashing warning light are operational</li> <li>Do not use mobile phone during plant operation</li> <li>Plant operators to communicate via 2-way radio</li> <li>Wear seatbelt restraint during operations</li> </ul>	Operator	15
		Plant roll-over	2	<ul style="list-style-type: none"> <li>Ensure ground conditions are suitable for mobile plant</li> <li>Plant to have ROPS</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
			2	<ul style="list-style-type: none"> <li>Do not operate mobile plant on gradients steeper than those approved by manufacturer (Refer to Operators Manual);</li> <li>Do not exceed the machines Safe Workload Limit (SWL)</li> <li>Minimise travel direction changes when operating on a slope</li> <li>Avoid slopes across the direction of travel where practicable</li> <li>Operate slowly when approaching or driving down slope</li> <li>Ensure the load is distributed evenly &amp; that the machine not overloaded</li> <li>Keep the attachments low when transporting loads</li> <li>Perform loading / unloading operations on level ground / platform</li> <li>Maintain a safe working distance from excavations / batters etc.</li> <li>Drive at appropriate speeds for the site conditions</li> <li>Do not use mobile phone while operating plant</li> <li>Wear seatbelt restraint during plant operation</li> <li>Never carry passengers</li> </ul>	Operator	15
		Plant failure or in unsafe condition	10	<ul style="list-style-type: none"> <li>Ensure plant is suitable for task, terrain &amp; site conditions</li> <li>Plant to be inspected, serviced &amp; maintained as per manufacturer's instructions</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Adminstrate, PPE):	Responsible Person:	Residual Risk / Impact Rating
			10	<ul style="list-style-type: none"> <li>Operation of the plant must follow the manufacturer's instructions / guidelines</li> <li>Complete daily pre-start safety checks</li> <li>Faulty or damaged plant must be tagged 'Out of Service' and reported immediately to the Synergy Project Supervisor</li> <li>All servicing &amp; repairs must be completed by a competent person</li> </ul>	Operator	15
	Open excavations	Persons falling into excavation	17	<ul style="list-style-type: none"> <li>Only authorised personnel permitted to work near open excavations</li> <li>Do not enter open excavations greater than waist deep without adequate support systems in place</li> <li>Maintain exclusion zones around open excavations to prevent unauthorised access during test pitting works</li> <li>Backfill excavations to blend with the surrounding finish heights as soon as practicable</li> </ul>	SRM Project Supervisor	22
		Excavation collapse	3	<ul style="list-style-type: none"> <li>Only plant, vehicles &amp; materials essential for the task permitted in the work area</li> <li>Place excavated material away from the excavation edge</li> <li>Excavations deeper than 1.5m must be battered, benched or shored</li> <li>When battering or benching the angle of repose must not be greater than 45°</li> </ul>	SRM Project Supervisor	15

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
Lifting with excavator (Road plates, Shoring boxes etc.)	Suspended load	Lifting equipment failure	6	<ul style="list-style-type: none"> <li>Maintain exclusion zone around lifting operations for all non-essential personnel</li> <li>Competent person to perform all checks &amp; supervise lifting activities</li> <li>Check that the lifting lugs / attachments are in good condition</li> <li>Only approved, tagged &amp; engineered slings, chains &amp; other lifting gear complying with relevant Australian Standards to be used</li> <li>Ensure lifting equipment components are compatible</li> <li>Ensure load is within lifting equipment's Safe Workload Limit (SWL)</li> <li>Only attach lifting equipment to the excavators designated lifting points</li> </ul>	SRM Project Supervisor	15
			6	<ul style="list-style-type: none"> <li>Ensure load is within excavators Safe Workload Limit (SWL)</li> <li>Operator to remain in cabin at all times whilst load is suspended</li> </ul>	Operator	15
		Uncontrolled suspended load	6	<ul style="list-style-type: none"> <li>Ensure load is evenly balanced</li> <li>Use tag lines when necessary to help maintain control of the suspended load</li> <li>Tag lines to be a suitable length so that the user can maintain a safe distance from the suspended load &amp; operating plant</li> </ul>	Individual Workers	15
		Crushing or amputation	6	<ul style="list-style-type: none"> <li>Do not lift loads over workers / or other trade activities</li> </ul>	Operator	15



Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating
			6	<ul style="list-style-type: none"> <li>Do not stand or put body parts under a suspended load</li> <li>Ensure load is balanced &amp; secure before removing lifting equipment</li> </ul>	Individual Workers	15

**Dynamic Hazard / Aspect Identification & Risk / Impact Assessment:**

Activity / Job Steps:	Hazards / Aspects Identified:	Associated Risks / Impacts:	Risk / Impact Rating:	Control Measures (Eliminate, Substitute, Isolate, Engineer, Administrative, PPE):	Responsible Person:	Residual Risk / Impact Rating

**ESWMS Review & Revision:**

Synergy shall review this ESWMS, in consultation with workers undertaking the activities concerned, under the following circumstances:

- Synergy shall review this ESWMS, in consultation with workers undertaking the activities concerned, under the following circumstances;
- When deficiencies are identified during the completion of the ESWMS Review Report;
- When there has been failure in the control measures resulting in an injury, illness, near miss or environmental incident;
- Following a previously unidentified hazard / aspect being identified during a pre-start meeting, toolbox talk, site safety inspections; audit or hazard / aspect reporting process;
- Following a previously unidentified hazard / aspect being identified through relevant industry material, regulator advice, or interested party information;
- Following new products, services and processes or changes to existing products, services, and processes, including:
  - Workplace locations and surroundings;
  - Work organisation;
  - Working conditions;
  - Tools, plant, equipment, products and / or materials;
  - Workforce;
  - Scope of works or intended work methods;
- Following changes to applicable compliance obligations and other requirements;
- Following changes in knowledge and / or information regarding hazards / aspects and risks / impacts;
- Developments in knowledge and / or technology; and
- Following changes to the company policy statements.

**Record of Review & Revision:**

Date:	Completed By:	Signature:	Authorised By (PCBU Representative):	Signature:	Description of Amendments: (List New Revision Number / Date If Applicable):

**ESWMS Sign-Off:**

I acknowledge that the relevant aspects of the ESWMS's have been explained to me and that the requirements are understood, by providing my signature below.

**Scan Sitemate ID**

Name	Company	Signature	Date	Time	Location
There are no signatures to display yet.					

**Signature:**

Not signed yet.

## Appendix 7

# SYN20 Plant Pre-Start Checklist

**Jay Bonnor**  
Created Fri, 01 Sep 2023, 1:35 PM (UTC+10)

Project:

Date:

-  
Is the item of plant / equipment owned by Synergy? -

Plant Type:

Make and Model:

Plant / Serial Number:

Machine Hours / Km's

Operator Competency:

Do you hold a National Unit of Competency, current Verification of Competency (VOC) or High Risk Work Licence to operate this item of plant? This may include workers who are currently recording hours in a logbook under instruction from an experienced operator or Registered Training Organisation (RTO).

Comments::

Key:

Yes = OK

No = Fault / Damage Identified

Handrails, grabs, steps, ladders, platforms and guardrails secured, free from debris and in good working order?

-

Comments::

Cabin doors, windows, windscreens and operator mirrors in good working order?

-

Comments::

Seats securely fitted, seatbelts free from damage / tears and in good working order?

-

Comments::

Battery in good condition? (Recommended visual inspection to include: no loose parts, battery secure, no signs of leaking, connections are clean and free of corrosion)

-

Comments::

Instruments functioning correctly? (Examples include: control panels, speedometer, hour meter, fuel / oil / coolant level indicators, temperature gauges, pressure gauges, voltage meter, frequency meter, flow meter, parking brake indicator, LCD displays etc.)	-	Comments::
Electrical components in good condition? (Examples include: alternator, starter motor, fuses, lighting, signals, control panel devices, wiring etc.)	-	Comments::
Hand and foot controls operating correctly? (Examples include; joysticks, levers, steering wheel, pedals, buttons and switches etc.)	-	Comments::
Amber rotating / flashing / strobe warning light operating correctly?	-	Comments::
Reverse alarm operating correctly with the volume level appropriate to warn workers on foot in the vicinity?	-	Comments::
Covers, screens and safety guarding in place and in good working order? (Examples include: belt, fan and engine covers, radiator screens, guards over moving parts such as gears, chains and sprockets etc.)	-	Comments::
Roll-Over Protective Structure (ROPS) in good working order?	-	Comments::
Exhaust system operating correctly? (Recommended inspection to include: checks for signs of leaks, cracks or holes in pipes, loose or damaged connections and excessive noise etc.)	-	Comments::
All grease / lubrication points inspected and grease added where required? (Examples include: bearings at pulleys, rollers and wheels, pivot points such as arms, buckets, blades, booms, hinge and swivel joints, hydraulic and control cable linkages, pins, bushings and gearboxes etc.)	-	Comments::
Hydraulic hoses and connectors free from leaks.	-	Comments::
Engine bay and components free from fluid leaks such as fuel, oil, coolant and transmission fluid?	-	Comments::
Fluid levels are sufficient? (Examples include: engine oil, hydraulic oil, coolant, brake fluid, transmission fluid and water etc.)	-	Comments::

Wheels, tyres, skids, tracks, rollers in good working order? (Examples include: signs of damage / excessive wear, deflation, cuts or bulges etc.)	-	Comments::
Attachments in good working order? (Examples include: buckets, tynes, forks, grabs, shears, hammers, augers, sweeper and jib sections etc.)	-	Comments::
Fire extinguisher provided, fully charged, current test tag and readily available? (Note: Fire extinguishers are to be tested and tagged 6 monthly)	-	Comments::
Emergency Stop (E-Stop) functioning correctly?	-	Comments::
Have any faults or damage been identified above?	-	Comments::

**Additional Comments:**

Template Rev.11 - 23.02.23

## Appendix 8



# SYN13 Hazard & Aspect Report

**Jay Bonnor**  
 Created Fri, 01 Sep 2023, 1:35 PM (UTC+10)

Event Number:

**Part A**

Details of Hazard / Aspect (to be completed by affected person or witness).

Project:

Event nature:

Description:

Include photos where applicable:

Name, Position & Company of person completing Part A:

Date: -

Signature: -

**Part B**

Investigation & Corrective Action Identification (to be completed by EHSQ Manager).

Additional Information / Investigation:

Corrective Action:

Action Number:	Corrective Action Required:	Person Responsible (Name, Position & Company):	Due Date / Timeframe :

Name, Position & Company of person completing Part B:

Date: -

Signature: Not signed yet.

**Part C**

Corrective Action Implementation & Confirmation.

Corrective Action Implementation:

Action Number:	Corrective Action Implemented By (Name, Position & Company):	Signature:	Date:

Corrective Action Confirmation:

Name, Position & Company of person completing Part C:

Date: -

Signature: -

Template Rev.8 - 27.12.19

## Appendix 9

# SYN26 Incident Report

**Jay Bonnor**  
Created Fri, 01 Sep 2023, 1:37 PM (UTC+10)

Event Number:

## Part A

Incident Details (to be completed by affected person or witness).

Name of person involved:

Date of birth of person involved: -

Address of person involved:

Phone number of person involved:

Role of person involved:

Address where incident occurred:

Specific location where incident occurred:

Date & time of incident: -

Date & time reported: -

Incident witness contact details:

Name, Position & Company:	Email Address:	Phone Number:
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Where did the incident occur?

What treatment was received?

### Note Definitions:

First Aid Injury = First aid treatment only, Lost Time Injury / Illness = 1 full day off work or more, Restricted Work Injury = Restriction imposed by Medical Practitioner, and Medical Treatment Injury / Illness = Treatment by Medical Practitioner or from Medical Practitioner's referral.

What was the result of incident?

Describe how the incident occurred:

Include photos where applicable:

Name, Company & Position of person completing Part A:

Date: -

Signature: -

## Part B

Investigation & Corrective Action Identification (to be completed by EHSQ Manager).

Additional Information / Investigation:

**Corrective Action:**

Action Number:	Corrective Action Required:	Person Responsible (Name, Position & Company):	Due Date / Timeframe :
----------------	-----------------------------	--	------------------------

Name, Position & Company of person completing Part B:

Date: -

Signature: Not signed yet.

**Part C  
 Corrective Action Implementation & Confirmation.**

**Corrective Action Implementation:**

Action Number:	Corrective Action Implemented By (Name, Position & Company):	Signature:	Date:
----------------	--	------------	-------

**Corrective Action Confirmation:**

Name, Position & Company of person completing Part C:

Date: -

Signature: -

Template Rev.6 - 12.07.22

DASHPIVOT TEMPLATE

## Appendix 10



**Figure 4: Proposed Sampling Locations**  
 Chatswood Pre-Remediation Investigation  
 Sampling Analysis and Quality Plan

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DATA SOURCE  
 Imagery: Nearmap, 2023



**nation partners**

## Appendix 11

## Unexpected Finds Protocol (SYN74)

### 1 – Introduction

The aim of this protocol is to provide information to personnel conducting works on site with the necessary information to identify potentially significant or hazardous finds and the actions required should such unexpected / suspicious material be discovered.

### 2 - General

It is possible that during work operations material or items may be encountered that are not what is expected. Should unexpected finds that are potentially hazardous or significant be encountered they must be reported immediately to the Synergy Project Supervisor / Manager.

Unexpected findings may include:

- ✦ Odorous material, like petrol, ammonium (cleaning products), solvents (can be sweet smelling), tars, mothballs (naphthalene), and the like;
- ✦ Buried building wastes or general refuse;
- ✦ Oily material and / or petrol-like sheen;
- ✦ Artefacts, including building footings, old sumps or pits, burial pits, bones, etc.;
- ✦ Fibrous cement, including fibro cladding and pipes which could include asbestos containing material (ACM);
- ✦ Previously unidentified defunct underground services and infrastructure; and
- ✦ Unexploded ordnance (UXO).

Examples of unexpected findings are illustrated in the attached figures.

### 3 - Protocol

If an unexpected find is encountered the following protocol should be adopted:

- ✦ Stop work in the immediate area;
- ✦ Immediately report the find to the Synergy Project Supervisor / Manager;
- ✦ Establish the required controls, which may include barricading, fencing, warning signs, covering odorous / volatile materials etc.;
- ✦ The Synergy Project Supervisor / Manager shall complete a **Hazard / Aspect Report (SYN13)**, which is to include information and photographs of the location, extent, odours, appearance, etc. of the unexpected find;
- ✦ The Synergy Project Supervisor / Manager shall provide a copy of the **Hazard / Aspect Report (SYN13)** to the client project representative, the Synergy Project Director and Synergy EHSQ Manager;
- ✦ The Synergy Project Supervisor / Manager shall liaise with the client project representative to arrange for the necessary investigations to be undertaken to identify the unexpected find and provide guidance on the corrective action required; and
- ✦ Works in the vicinity of the unexpected find may not recommence until the appropriate remediation works have been completed (where required) and approval provided by the client project representative and the Synergy Project Supervisor / Manager.



Potential Unexpected Finds

'Fibro' Asbestos Cement Pipes:



'Fibro' Asbestos Cement Sheets:



'Fibro' Asbestos Cement Fragments:



Potential Unexpected Finds

Sheens on Water:



Grey / Green Stained Soil (Fuel Release):



Grey Soil with Orange Mottling (Acid Sulphate soils):



Potential Unexpected Finds

Defunct Infrastructure (Underground Storage Tank):



Defunct Services (Clay Pipe):



Rubbish:



Potential Unexpected Finds

Archaeological & Heritage Items:



Archaeological & Heritage Items:



Archaeological & Heritage Items:



Potential Unexpected Finds

Unexploded Ordnance (UXO):



Unexploded Ordnance (UXO):



Unexploded Ordnance (UXO):



✦ ACT

6 BARRON STREET  
DEAKIN ACT 2600

✦ NSW

1/2 FORGE PLACE  
NARELLAN NSW 2567

✦ QLD

SUITE 2, LEVEL 2, 64 MARINE PARADE  
SOUTHPORT QLD 4215

✦ TAS

LEVEL 1, 99 LIVERPOOL STREET  
HOBART TAS 7000

✦ NT

32 HAZELL COURT  
COCONUT GROVE NT 0810



## E RIW Competency Register

## Appendix E – Competency Register

Name	Company	White Card No. (Construction Induction)	RIW Card No	Completed Site Induction?	Signature (HSEP sign on)	Date
<b>Bradley Coates</b>	Nation Partners					
<b>Liam Gooley</b>	Nation Partners					
<b>Ryan Thomson</b>	Nation Partners					
<b>Nelson Phillips</b>	Nation Partners					



Name	Company	White Card No. (Construction Induction)	RIW Card No	Completed Site Induction?	Signature (HSEP sign on)	Date



# F Underground Services Clearance Standard Operating Procedure

## Appendix E – Nation Partners Service Clearances Standard Operating Procedure

Nation Partners SOP-SC-02 – Service Clearance.

Aspect	Details
What is the purpose of this procedure?	To describe the methods by which site service clearance should be undertaken prior to intrusive investigations to minimise the risks and hazards associated with above and underground services.
What type of data will this procedure generate?	Implementing this procedure will assist in locating intrusive investigation locations in consideration of above and underground services.
What are the key points and lessons learned?	<p>Whilst investigation locations are planned to provide adequate spatial coverage across a site, or target potentially contaminating activities, safety during sampling is paramount. The use of this SOP will assist in avoiding potential risks and hazards presented by above and underground services during fieldworks, in particular:</p> <ul style="list-style-type: none"> <li>- Electricity.</li> <li>- Water and sewer.</li> <li>- Gas.</li> <li>- Telecommunications.</li> <li>- Oil/fuel.</li> </ul>
Equipment Details	<ul style="list-style-type: none"> <li>» Field notebook and/or tablet</li> <li>» Pens and permanent markers</li> <li>» Charged camera/mobile phone</li> <li>» Sampling plan/proposal and JSEA/SWMS</li> <li>» PPE</li> <li>» Line marking spray paint, ideally pink, or stakes/pins with pink surveyors tape</li> <li>» Dial Before You Dig (DBYD) service maps</li> <li>» Client service diagrams/maps</li> <li>» Tape measure</li> <li>» Suitably qualified underground cable locating contractor</li> </ul>

Aspect	Details
Procedure Details	<p><b>At Least 5 Days Before Attending Site</b></p> <ul style="list-style-type: none"> <li>» Submit a DBYD enquiry for the site. If you have not used DBYD online tool before you will need to create a new account. Once the confirmation email has been received you can make an enquiry.</li> <li>» Save the respective emails and plans from each asset owner in clearly labelled folders in Box.</li> <li>» If required by the DBYD response, contact the respective asset owner regarding a high risk underground service, or re-locate positions at the asset owner required minimum off-set from the service.</li> <li>» Engage a suitably qualified underground service locator for the works.</li> <li>» Request any service plans, diagrams, or as-builts from the Client.</li> <li>» Review the proposed sampling locations against the asset plans with your PM and/or PD, and re-locate sample locations in the immediate vicinity of high-voltage electricity, high-pressure gas/fuel/oil, or major Sydney Water assets.</li> <li>» Email the asset plans to the underground service locator.</li> <li>» Ensure the underground service locator has the appropriate equipment and training to deliver the services (e.g. has ground penetrating radar if needed).</li> </ul> <p><b>The Day Before Attending Site:</b></p> <ul style="list-style-type: none"> <li>» Check the field tablet (if using one) is charged, clean, and functional.</li> <li>» Assess the safety requirements to perform the works and that the JSEA/SWMS and/or HSEP is appropriate.</li> <li>» Add project to Fulcrum app, Onenote or any other field monitoring app to be used.</li> <li>» Check the sampling locations are in a mapping tool (e.g. QGIS).</li> <li>» Print all relevant documentation or save to tablet/phone (sampling location figure, JSEA/SWMS, and DBYD (including asset plans)).</li> <li>» Plan on how locations are to be marked (i.e. line marking paint for hardstand, stake/pins with surveyors tape for grass/exposed soil, contingency for line marking paint if raining).</li> </ul> <p><b>Underground Services Location</b></p> <ul style="list-style-type: none"> <li>» Prior to clearing individual sampling locations, the underground service locator is required to identify all services and either mark each service on the ground, or mark on an accurate to scale survey plan.</li> <li>» Service locating is to be undertaken by an electronic pipe or cable locator at a minimum, ground penetrating radar is also to be used when non-magnetic services (i.e. PVC) are potentially present.</li> </ul>

Aspect	Details
	<ul style="list-style-type: none"> <li>» Whilst the locator is marking services, mark your proposed sample locations across the site, including the respective sample location number (i.e. in line marking paint or written on the surveyors tape).</li> <li>» Whilst marking proposed locations, inspect the surrounds for indicators of services and mark locations at a minimum 2 metre off-set from:               <ul style="list-style-type: none"> <li>– Service pits and lids.</li> <li>– Service trenches.</li> <li>– Newly patched concrete or bitumen.</li> <li>– Kerb markings.</li> <li>– Breather pipes adjacent to buildings.</li> <li>– Downpipes.</li> <li>– Taps, hydrants, valves, or other water features.</li> <li>– Lights or powerpoints.</li> </ul> </li> <li>» For locations within 2 m of a known service (i.e. targeting a potentially contaminating activity), the location of the service is to be confirmed by potholing.</li> <li>» After the service locator has identified and marked out all known services, the service locator is to assess each of the proposed sampling locations.</li> <li>» An area around each proposed sampling location will be cleared and marked using line marking paint as a contingency for if the location is required to be moved (i.e. due to refusal). To allow for inaccuracies of plans and the possibility of unknown or hidden services undetectable by the service locator (i.e. PVC), the area cleared should be a minimum 2 m radius (i.e. 4 m diameter) around the proposed sampling locations.               <ul style="list-style-type: none"> <li>– For larger excavations (i.e. test pits), the entire excavated area is to be cleared, including a 2 m buffer around the entire excavation.</li> </ul> </li> <li>» The location of all identified services are to be marked by the locator, even if they are not in the vicinity of proposed sampling locations.</li> <li>» Take photographs of each sample location for upload to Box as a record of service clearance. The context of the sample location should be visible in the photo, including the proposed location number, surrounding services (if present), cleared radius, and distinguishing site features (take multiple photos if necessary).</li> <li>» Request a copy of the service clearance report from the underground service clearance contractor.</li> </ul> <p><b>Underground Services Borehole Clearance</b></p> <ul style="list-style-type: none"> <li>» Soil sampling and groundwater monitoring well installation locations are to be cleared to 1.2 m below ground level by non-destructive digging (i.e. hand</li> </ul>

Aspect	Details
	<p>auger or potholing). This distance has been determined by the common depths of underground services per Appendix C of SafeWork NSW (2007) <i>Work Near Underground Assets – Guide</i>. NDD may be required to extend to depths greater than 1.2m if services of concern are identified to be present at depths greater than 1.2m or if the asset owner has specific requirements.</p> <ul style="list-style-type: none"> <li>» During NDD clearance, observe the cuttings for evidence of marker layers, backfill sands or aggregate indicating a potential service. If observed, stop works, backfill the location and reinstate. Move the proposed sample location off-set with the indicative service within the previously cleared radius.</li> <li>» During NDD clearance, if an underground service is exposed, stop works, attempt to identify the type of service and orientation. Report as a near-miss. Photograph the service (if possible). Backfill and reinstate the location.</li> <li>» During NDD clearance, if an underground service is struck and damaged, stop works and report as an incident. The incident is to be reported immediately to the Nation Partners PM or PD and subsequent reporting is to be undertaken in accordance with the JSEA and the requirements of the asset owners (as set out in the DBYD documentation). Subsequent rectification works are subject to the type of service and the incident notification process.</li> <li>» Once the location is cleared to 1.2 mbgl (or site specific depth), continue sampling/drilling per the respective SOP.</li> </ul> <p><b>Overhead Services (when using mobile plant)</b></p> <ul style="list-style-type: none"> <li>» Thoroughly examine the approaches and surrounds of the site to establish safe access paths to proposed sample locations.</li> <li>» All plant is not to come within 8 m of overhead powerlines. This distance takes into account: <ul style="list-style-type: none"> <li>– The sag of cables.</li> <li>– The swing of the plant load during handling.</li> <li>– The effect of wind.</li> <li>– The height of the drill rig/excavator. However a site specific risk assessment should be undertaken with the respective sub-contractor.</li> </ul> </li> <li>» If a risk assessment indicates that this distance may not be maintained during the work, then consideration to alternative methods which eliminate the risk of contact should be undertaken (i.e. use smaller plant, or move the sampling location).</li> </ul> <p><b>NOTES:</b></p> <p>*Some clients/sites require their own internal procedure for the clearance of underground services is undertaken. Client/site procedures take precedence over this SOP.</p>

Aspect	Details
	<p>*For work in footpaths, public roads, or road reserves, refer to Appendix C in SafeWork NSW (2007) <i>Work Near Underground Assets – Guide</i> for drawings showing typical underground service horizontal and vertical locations.</p> <p>*For work in footpaths or public roads, traffic control is required in accordance with RTA <i>Traffic Control at Work Sites Manual</i>.</p>
Reference Material	<p>SafeWork NSW (2007) <i>Work Near Underground Assets – Guide</i>  <a href="https://www.safework.nsw.gov.au/_data/assets/pdf_file/0009/54378/SW08773-Work-near-underground-assets-guide.pdf">https://www.safework.nsw.gov.au/_data/assets/pdf_file/0009/54378/SW08773-Work-near-underground-assets-guide.pdf</a></p>



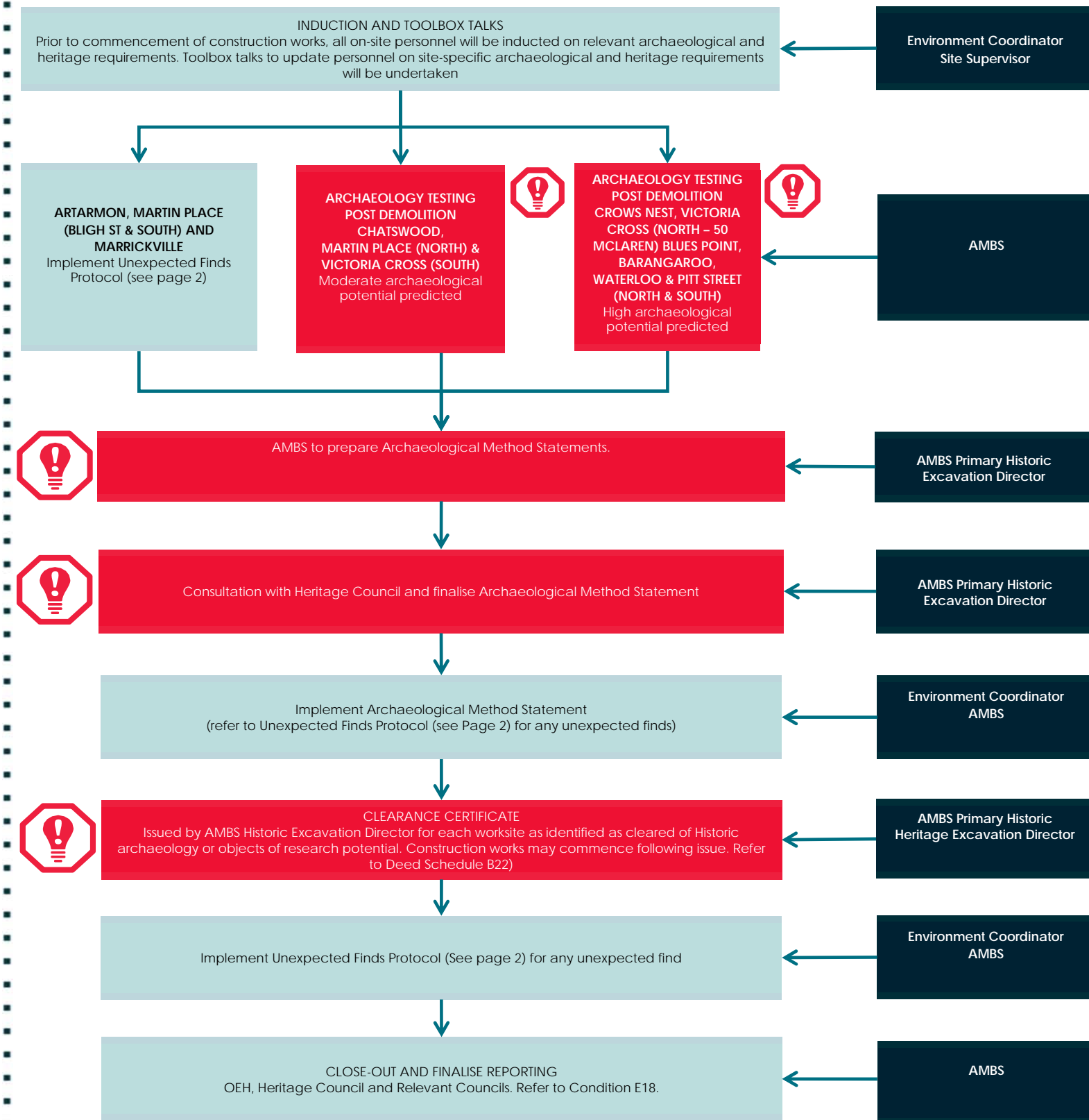
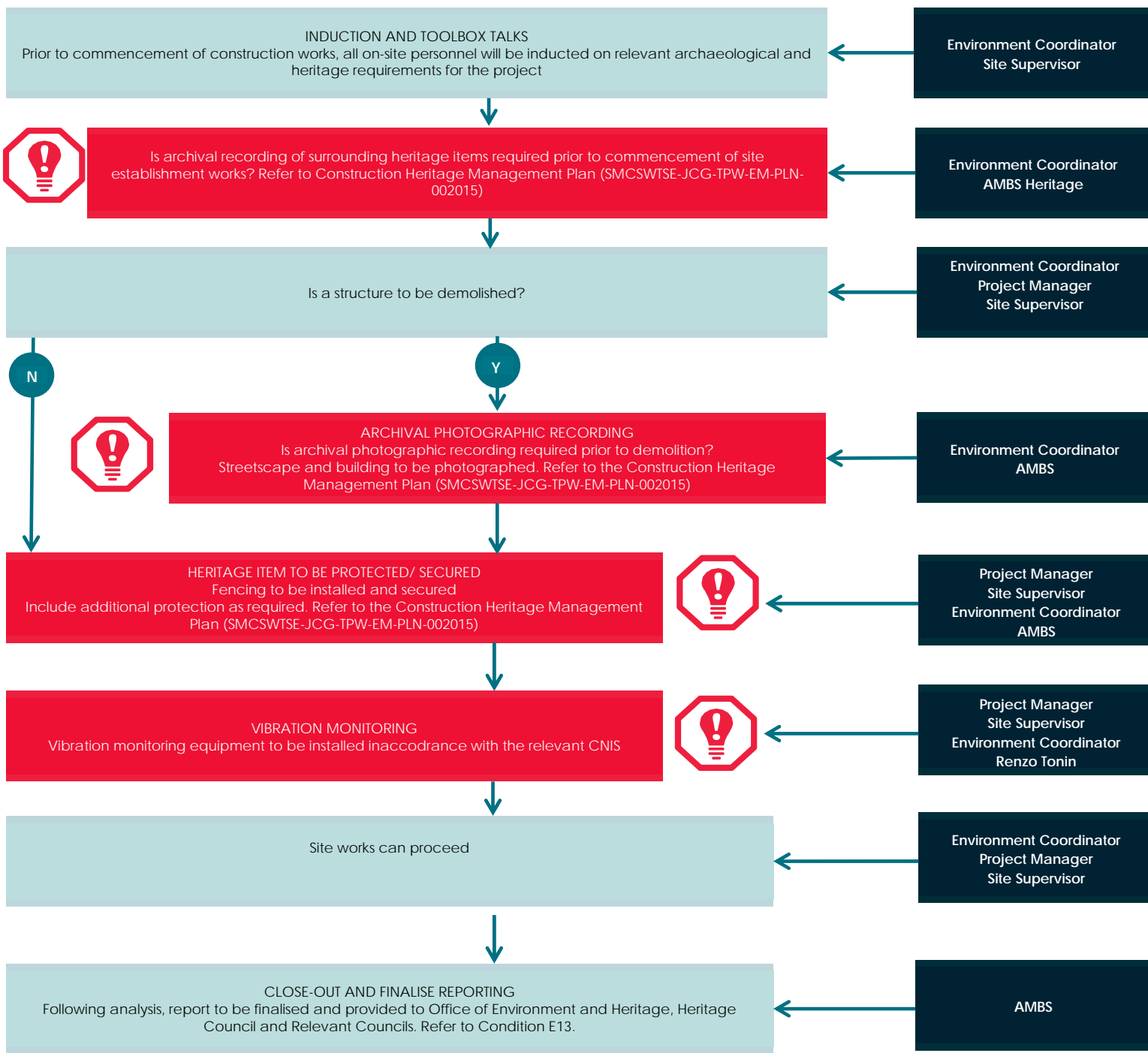
## G Unexpected Heritage Procedures

### G1 ABORIGINAL AND HISTORIC HERITAGE MANAGEMENT PROCEDURE

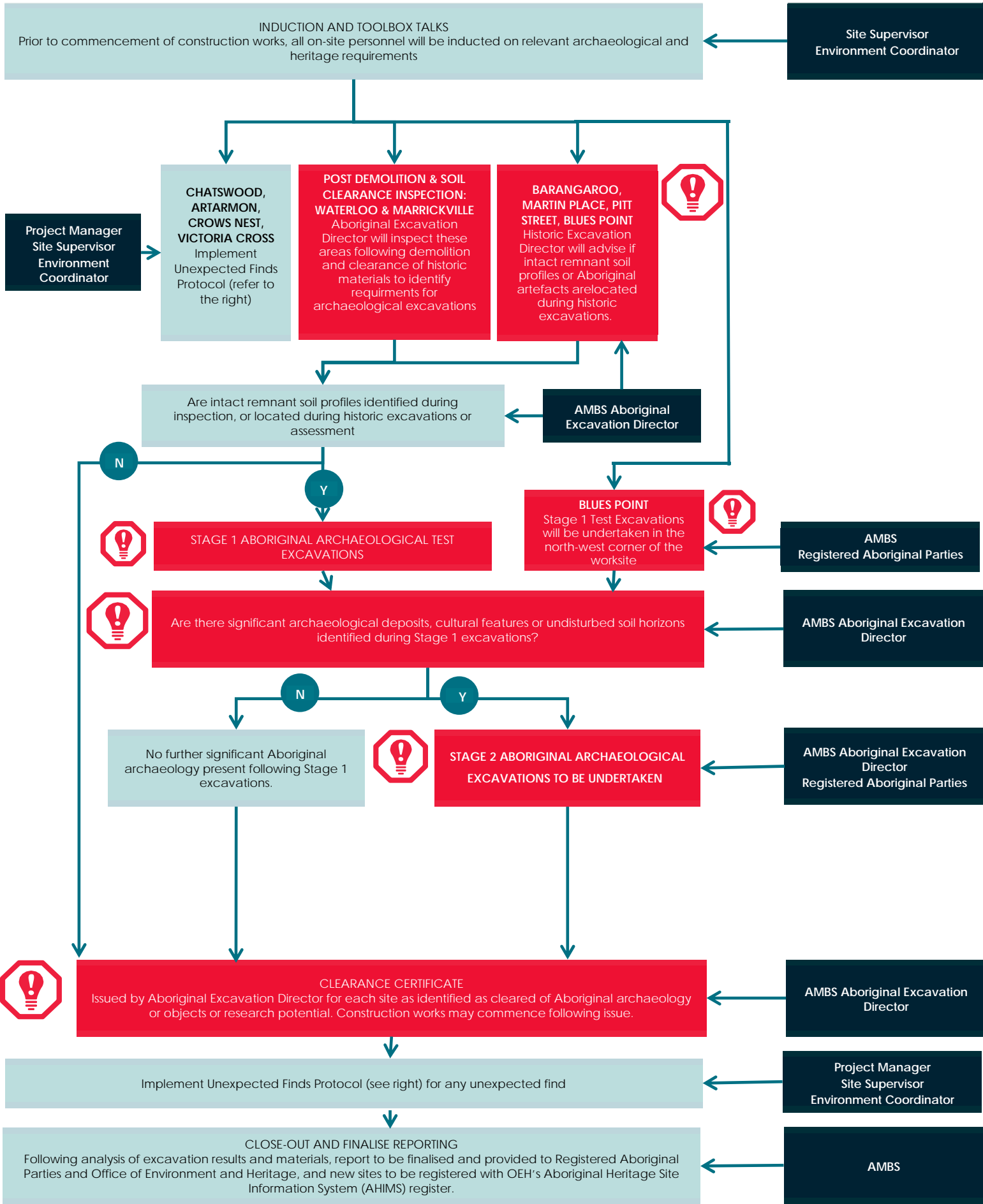


## ARCHIVAL RECORDING AND PROTECTION PROTOCOL

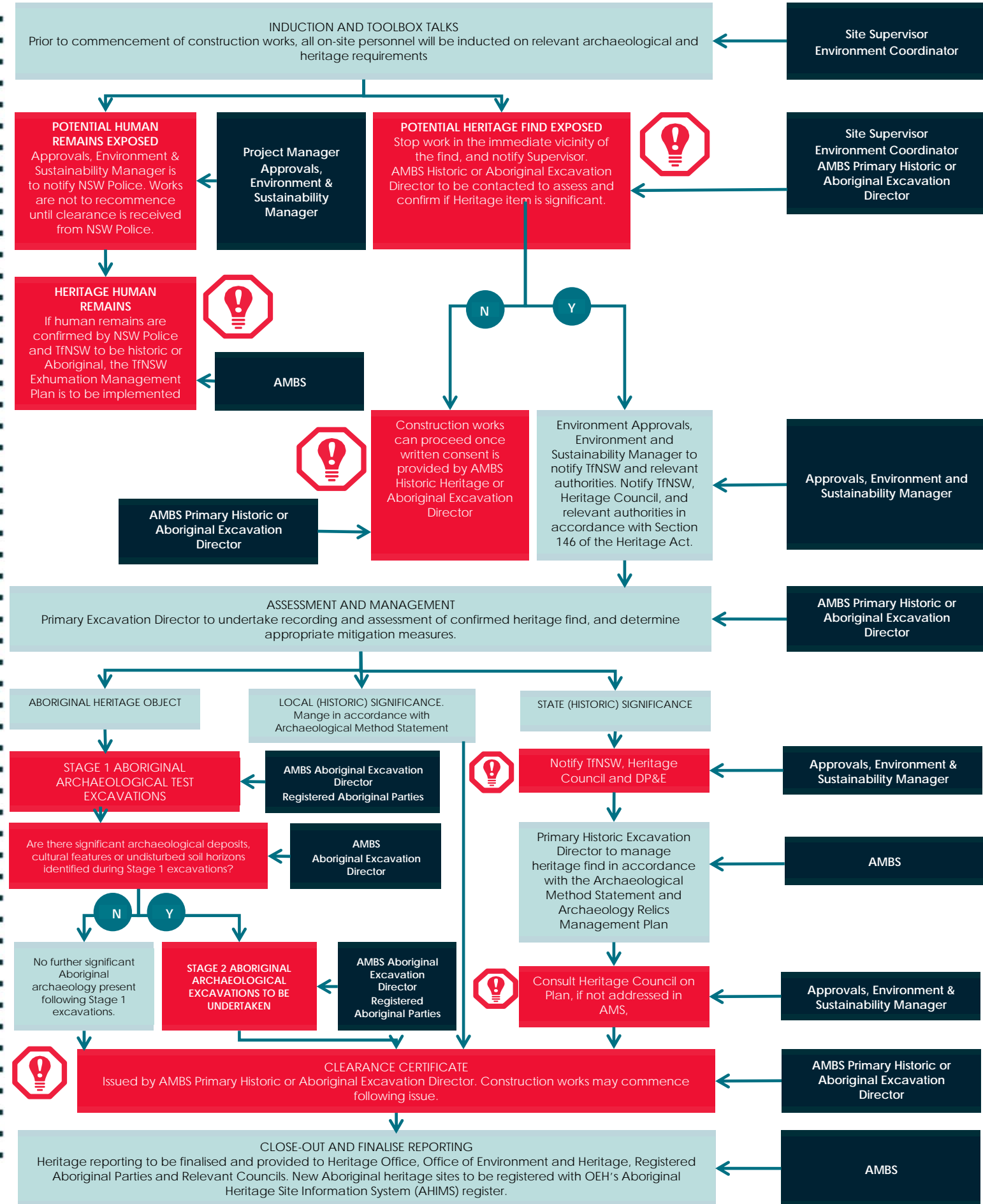
## HISTORICAL ARCHAEOLOGICAL SITES PROTOCOL



## ABORIGINAL ARCHAEOLOGICAL SITES PROTOCOL



## ABORIGINAL AND HISTORIC HERITAGE UNEXPECTED FINDS PROTOCOL





## G2 Unexpected Heritage Finds Procedure - SM-20-00099497



# Unexpected Heritage Finds Procedure

SM-20-00099497

Metro Body of Knowledge (MBoK)

<b>Applicable to:</b>	Sydney Metro
<b>Document Owner:</b>	Senior Heritage Advisor
<b>System Owner:</b>	Deputy Chief Executive, Customer Operations & Outcomes
<b>Status:</b>	Final
<b>Version:</b>	5.0
<b>Date of issue:</b>	24 April 2023
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<b>Name of Approver:</b>	Carolyn Riley
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<b>Date Approved:</b>	24 April 2023
<b>Digital Signature:</b>	

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# 1. Introduction

## 1.1. Purpose

This Procedure has been prepared to provide a consistent approach to the management of unexpected Aboriginal and historic heritage uncovered during Sydney Metro activities. It applies to all Sydney Metro activities, both the pre-construction (prior to the Construction Heritage Management Plan approval) and construction phase (post Construction Heritage Management Plan approval) and pre or post-approval activities that are subject to the *NSW Heritage Act (1977)* (Heritage Act) and the *National Parks and Wildlife Act 1974* (NPW Act).

In NSW, there are strict laws to protect and manage both Aboriginal and historic heritage. As a result, appropriate management measures need to be implemented to avoid or minimise impacts, ensure compliance with statutory requirements, and to minimise the risk of penalties to individuals, Sydney Metro, and its contractors. This Procedure outlines Sydney Metro's obligations under the Heritage Act, NPW Act and the *Coroner's Act 2009* and State Significant Infrastructure (SSI) or State Significant Development (SSD) approvals issued by NSW Department of Planning and Environment where applicable.

Note that a Contractor must not amend this Procedure or use a different procedure without the prior approval of Sydney Metro.

This Procedure must be read in conjunction with the relevant approval conditions, contract documents and other plans and procedures including [SM-20-00099495 Exhumation Management Procedure](#), in addition to any other relevant documents as developed by the contractor for the delivery of Sydney Metro activities.

## 1.2. Scope

This Procedure applies to the discovery of any unexpected heritage item, where the find is not anticipated in an approved Archaeological Research Design (ARD) or Archaeological Method Statement (AMS) or other project specific document related to heritage. It applies to all Sydney Metro activities.

This Procedure must be followed by all Sydney Metro staff, contractors, subcontractors or any person undertaking work for Sydney Metro. It includes references to some of the relevant legislative and regulatory requirements but is not intended to replace them.

This Procedure *does not apply* to the discovery and disturbance of a heritage item:

- As a result of investigations being undertaken in accordance with the *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW4376 2010*; an Aboriginal Heritage Impact Permit (AHIP) issued under the NPW Act; or a permit approval issued under the Heritage Act; or
- As a result of construction related activities, where the disturbance is permissible in accordance with an AHIP, or an approval issued under the Heritage Act or State SSI or SSD planning approval; or
- Of local significance, where the find is identified and anticipated to occur in an AMS or ARD.

Construction Environment Management Plans (CEMPs), which are reviewed by the Sydney Metro Heritage team, should reference or include this Procedure. Where there is an approved CEMP, it must be followed in the first instance. Where there is a difference between approved

CEMPs and this Procedure, the approved CEMP must be followed. Where an approved CEMP does not provide sufficient detail on particular issues, this Procedure should be used as a reference.

## 1.3. Definitions and abbreviations

### 1.3.1. What is an unexpected heritage find?

An 'unexpected heritage find' can be defined as a:

- Unanticipated discovery of an Aboriginal object or archaeological work or relic, which Sydney Metro does not have approval to disturb and/or is not covered under an existing management process or plan
- Find that has not been identified or assessed in a project assessment or document related to heritage
- Find that is not referenced in an archaeological research design (ARD) or archaeological method statement (AMS)
- Find that is not covered by an existing approval under the NPW Act or Heritage Act.

### 1.3.2. Abbreviations

All terminology in this Procedure is taken to mean the generally accepted or dictionary definition. Acronyms and terms specific to this document are listed below.

Other terms and jargon are defined within the [SM-17-0000203 Sydney Metro Glossary](#).

**Table 1: Terms/acronyms and definitions**

	Definitions
<b>Aboriginal object</b>	An Aboriginal object is any deposit, object or material evidence (not being a handcraft made for sale) relating to the Aboriginal habitation of the area, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.
<b>AHIP</b>	Aboriginal Heritage Impact Permit.
<b>AMS</b>	Archaeological Method Statement.
<b>ARD</b>	Archaeological Research Design.
<b>CEMP</b>	Construction Environmental Management Plan.
<b>CoA</b>	Conditions of Approval.
<b>CSSI</b>	Critical State Significant Infrastructure.
<b>Disturbance</b>	Disturbance is considered to be any physical interference to an item that results in it being destroyed, defaced, damaged, harmed, impacted or altered in any way (this includes archaeological investigation activities).
<b>EP&amp;A Act</b>	NSW <i>Environmental Planning and Assessment Act 1979</i> .
<b>Excavation Director</b>	A person that has been determined by the Heritage Council of NSW or its delegate to meet the <i>Criteria for Assessment of Excavation Directors</i> (4 September 2019 and as updated) and can therefore competently archaeologically investigate a site of either local and/or state significance.
<b>Heritage Act</b>	NSW <i>Heritage Act 1977</i> .
<b>Heritage NSW</b>	Formerly Office of Environment and Heritage (OEH). Now Heritage NSW .



	Definitions
<b>NPW Act</b>	NSW <i>National Parks and Wildlife Act 1974</i> .
<b>Relic</b>	A relic means any deposit, artefact, object or material evidence that: <ol style="list-style-type: none"> <li>relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and</li> <li>is of State or local significance.</li> </ol>
<b>SSD</b>	State Significant Development.
<b>SSI</b>	State Significant Infrastructure.

## 1.4. Accountabilities

The Executive Director, Environment, Sustainability & Planning is accountable for this Procedure including approving the document, monitoring its effectiveness and performing a formal document review.

Direct Reports to the Chief Executive are accountable for ensuring the requirements of this Procedure are implemented within their area of responsibility.

Direct Reports to the Chief Executive who are accountable for specific projects/programs are accountable for ensuring associated contractors comply with the requirements of this Procedure.

## 2. Types of unexpected heritage finds and their statutory protections

Project, field and environmental personnel (including construction contractors) are critical to the early identification and protection of unexpected heritage finds.

[Appendix A: Examples of unexpected heritage finds](#) illustrates the wide range of heritage items uncovered to date during Transport for NSW projects and provides an understanding of what unexpected finds may look like.

Unexpected heritage finds are categorised as either:

- Aboriginal objects;
- Historic (non-Aboriginal) heritage items; or
- Human skeletal remains.

The relevant legislation that applies to each of these categories is described below.

### 2.1. Aboriginal objects

The NPW Act provides the basis for the care, protection and management of Aboriginal objects and places in NSW.

An Aboriginal object is defined as: *any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains.*

An 'Aboriginal place' is an area declared by the Minister administering the Act to be of special significance with respect to Aboriginal culture. An Aboriginal place does not have to contain physical evidence of occupation (such as Aboriginal objects).

Under section 87 of the Act, it is an offence to harm or desecrate an Aboriginal object or place. There are strict liability offences. An offence cannot be upheld where the harm or desecration was authorised by an AHIP and the permit's conditions were not contravened. Defences and exemptions to the offence of harming an Aboriginal object or Aboriginal place are provided in section 87, 87A and 87B of the Act. A person must notify Heritage NSW if a person is aware of the location of an Aboriginal object.

Penalties for some of the offences can include two years imprisonment and/or up to \$550,000 (for individuals), and a maximum penalty of \$1.1 million (for corporations).

Examples of Aboriginal objects include stone artefacts, shell middens, axe grinding grooves, pigment or engraved rock art, burials and scarred trees.

### IMPORTANT!

**All Aboriginal objects, regardless of significance, are protected under law.**

If any impact is expected to an Aboriginal object, an AHIP is usually required from Heritage NSW. When a person becomes aware of an Aboriginal object, they must notify Heritage NSW about its location. Assistance on how to do this is provided in section 4 (Step 5).

## 2.2. Historic heritage items

The Heritage Act provides for the care, protection and management of heritage items in NSW. Historic heritage include:

- Archaeological 'relics' as defined under the Heritage Act; and
- Other historic heritage such as works, buildings or movable objects, which are not considered 'relics' under the Act.

### 2.2.1. Archaeological relics

Under section 139, it is an offence to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed, unless the disturbance or excavation is carried out in accordance with an excavation permit issued by Heritage NSW under the Act.

A relic is defined as: *'any deposit, artefact, object or material evidence that: (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and (b) is of State or local heritage significance.'*

A person must notify Heritage NSW, if a person is aware or believes that they have discovered or located a relic (section 146). Penalties for offences under the Heritage Act can include six months imprisonment and/or a fine of up to \$1.1 million.

### IMPORTANT!

**All relics are subject to statutory controls and protection.**

If a relic is likely to be disturbed, an approval is usually required from the Heritage Council of NSW. When a person discovers a relic, they must notify the Heritage Council of NSW of its location.

### 2.2.2. Other historic heritage

Some historic heritage items are not considered to be 'relics', but are instead referred to as works, buildings, or movable objects. Examples of these items include culverts, former road surfaces, retaining walls, tramlines, rail track or sleepers, cisterns, fences, buildings and conduits.

Usually archaeological relics are uncovered via a process of excavation or soil removal. When an unexpected find is uncovered, an archaeological excavation permit under section 140 or section 60 of the Heritage Act may be required to further investigate or remove it if investigation is not covered by an existing approval. In contrast, 'other historic items' either exist above the ground surface (for example a shed), or they are designed to operate and exist beneath the ground surface (for example a culvert). They may also need a permit to alter, disturb or remove them if there is not an approval already in place.

### 2.3. Human skeletal remains

[SM-20-00099495 Exhumation Management Procedure](#) provides a more detailed explanation of the approval processes related to human skeletal remains.

Human skeletal remains can be classified as:

- Reportable deaths;
- Aboriginal objects; or
- Relics.

Where it is suspected that less than 100 years has elapsed since death, human skeletal remains come under the jurisdiction of the State Coroner and the *Coroners Act 2009* (NSW). Under s35(2) of the Act, a person must report a death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old regardless of ancestry. Public health controls may also apply.

Where the remains are suspected of being more than 100 years old, they are considered to be either Aboriginal objects or non-Aboriginal relics, depending on the ancestry of the individual. Aboriginal human remains are protected under the NPW Act, while non-Aboriginal heritage remains are protected under the Heritage Act.

The approval and notification requirements of these Acts are described above in Sections 2.1 and 2.2. The discovery of Aboriginal human remains also triggers notification requirements to the Commonwealth Minister for the Environment under s20 (1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

#### **IMPORTANT!**

**All human skeletal remains are subject to statutory controls and protections.**

All bones must be treated as potential human skeletal remains and work around them must stop while they are protected and investigated urgently.

### 3. Unexpected heritage finds procedure

On discovering something that could be an unexpected heritage item on a Sydney Metro project, the following procedure must be followed. There are seven steps in the procedure.

**IMPORTANT!**

Sydney Metro may have approval to impact certain heritage items during construction. If you think that you may have discovered a heritage item and you are unsure whether an approval is in place or not, **STOP** work and follow this Procedure.

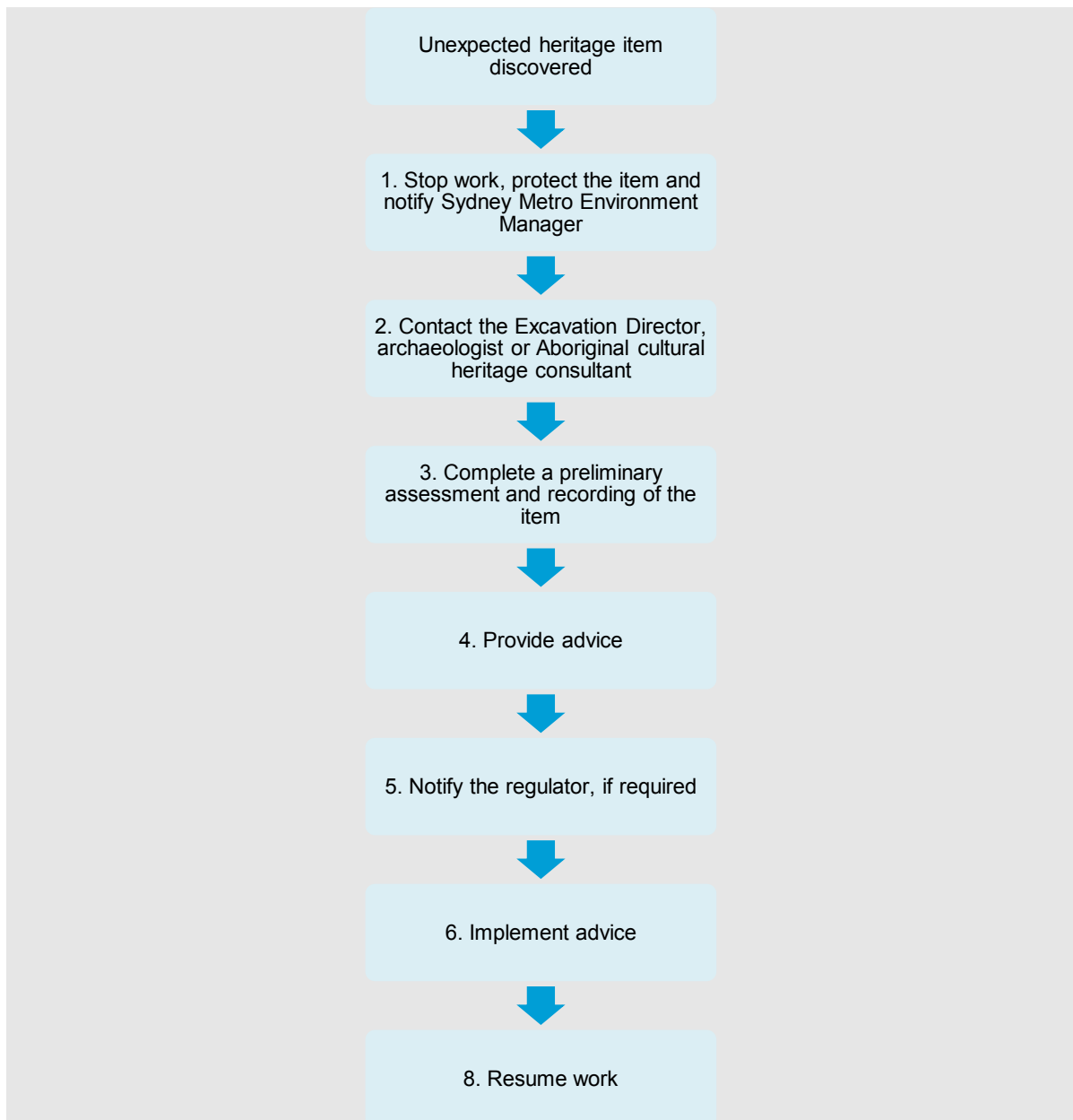


Figure 1: Summary of steps to be taken on the discovery of an unexpected heritage item

Table 2: Specific tasks to be implemented following the discovery of an unexpected heritage item

Step	Task	Responsibility	Guidance and tools
<b>1</b>	<b>Stop work and protect the item</b>		
1.1	Stop all work in the immediate area of the item and notify the Project Manager	Contractor/ Supervisor	<a href="#">Appendix A: Examples of unexpected heritage finds</a>
1.2	Establish a 'no-go zone' around the item. Use high visibility fencing, where practical. No ground disturbing work is to be undertaken within this zone until further archaeological investigations are completed, and if required, appropriate approvals are obtained.  Inform all on-site personnel about the no-go zone.	Contractor's Project Manager or Supervisor	
<b>2</b>	<b>Engage an archaeologist</b>		
2.1	Contact the nominated Excavation Director, archaeologist or Aboriginal cultural heritage consultant to discuss the location and nature of the item and arrange an inspection. The project CEMP should contain the contact details of the archaeologist.  Provide as much information as possible to the Excavation Director, archaeologist or Aboriginal cultural heritage consultant, including photographs of the item.  Inform the Sydney Metro Environment Manager and keep them involved in the process. The Environment Manager will inform the Sydney Metro Senior Heritage Advisor.	Contractor's Project Manager	
2.2	Where there is no project Excavation Director, archaeologist or Aboriginal cultural heritage consultant engaged for the work, engage a suitably qualified consultant to assess the find.  If the find is likely to be an Aboriginal object, engage a suitably qualified and experienced Aboriginal cultural heritage consultant.  If the find is a historic heritage item, engage a suitably qualified and experienced historical archaeologist.	Contractor's Project Manager	
<b>3</b>	<b>Preliminary assessment and recording</b>		
3.1	Occasionally, the Excavation Director, archaeologist or Aboriginal cultural heritage consultant may determine from the photographs provided at Step 2.1 that it is not necessary to inspect the item because no heritage constraint exists for the project (for example the item is not an Aboriginal object or archaeological relic).  This advice should be provided in writing (for example via email or letter with the consultant's name and company clearly identifiable) to the Sydney Metro Project Manager, Environment Manager and Senior Heritage Advisor.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	Proceed to Step 7
3.2	Arrange access for the Excavation Director, archaeologist or Aboriginal cultural heritage consultant to inspect the item as soon as practicable. In most cases, a site inspection is required to conduct a preliminary assessment.	Contractor's Project Manager/ Excavation Director	

Step	Task	Responsibility	Guidance and tools
3.3	<p>Subject to the Excavation Director, archaeologist or Aboriginal cultural heritage consultant's assessment, work may recommence at a set distance from the item.</p> <p>This is to protect any other archaeological evidence that may exist in the vicinity, which may have not yet been uncovered.</p> <p>The 'no-go zone' established in Step 1.2 may need to be adjusted to reflect the area of archaeological potential, as determined by the Excavation Director, archaeologist or Aboriginal cultural heritage consultant.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
3.4	<p>Has the item been damaged or harmed?</p> <p>If yes, record the incident in the Incident Management System. Implement any additional reporting requirements related to the planning approval and CEMP where relevant.</p>	Contractor's Project Manager/ Excavation Director, archaeologist or Aboriginal cultural heritage consultant	
3.5	<p>Can the work avoid further impact to the item?</p> <p>Project Manager to confirm with Sydney Metro Environment Manager.</p>	Contractor's Project Manager	
3.6	<p>Record the item and complete the Unexpected Heritage Item Recording Form.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	<p><a href="#">Appendix B: Unexpected heritage find recording form</a></p> <p><a href="#">Appendix C: Photographing unexpected heritage items</a></p>
3.7	<p>Is the item likely to be bone?</p> <p>If yes, follow the steps in <a href="#">Appendix D</a> 'Uncovering bones'.</p> <p>Where it is obvious that the bones are human remains, you must notify the local police by telephone immediately.</p> <p>They may take command of all or part of the site.</p> <p>Also refer to <a href="#">SM-20-00099495 Exhumation Management Procedure</a>.</p> <p>If no, proceed to the next step.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	
3.8	<p>The Excavation Director, archaeologist or Aboriginal cultural heritage consultant may provide advice after the inspection and preliminary assessment that no heritage constraint exists for the project (for example the item is not an Aboriginal object or relic).</p> <p>This advice should be provided in writing (for example via email or letter with the consultant's name and company clearly identifiable) to the Sydney Metro Project Manager, Environment Manager and Senior Heritage Advisor.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	Proceed to Step 7
3.9	<p>Where required, seek additional specialist technical advice (such as a forensic or physical anthropologist to identify skeletal remains).</p> <p>The Excavation Director, archaeologist or Aboriginal cultural heritage consultant can provide contacts for such specialist consultants.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	

Step	Task	Responsibility	Guidance and tools
<b>4</b>	<b>Provide advice</b>		
4.1	The Excavation Director, archaeologist or Aboriginal cultural heritage consultant should provide written advice with input from Registered Aboriginal Parties where appropriate. The plan should include as a minimum a) a description of the item, b) an assessment of the significance of the item, c) approval or statutory notification requirements, d) reporting requirements, e) consultation requirements, and f) relevance to other project approvals or management plans.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	<a href="#">Appendix D: Archaeological/heritage advice checklist</a> <b>Other references</b> DECCW 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 DECCW 2010, Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW Heritage Branch 2009, Assessing Significance for Historical Archaeological Sites and 'Relics'
4.2	In preparing the advice, the Excavation Director, archaeologist or Aboriginal cultural heritage consultant must review the CEMP, heritage sub-plans, conditions of project approval and associated heritage assessment documentation (for example an Environmental Impact Statement Technical Paper).  The Excavation Director, archaeologist or Aboriginal cultural heritage consultant must determine if the item is consistent with previous heritage or project approvals or management plans. The Project Manager must provide all relevant documents to the Excavation Director to assist with this.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
4.3	The Excavation Director, archaeologist or Aboriginal cultural heritage consultant must submit this advice as a report, letter or email to the Project Manager as soon as practicable.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	
4.4	The Project Manager, Sydney Metro Environment Manager and Sydney Metro Senior Heritage Advisor should review the advice to ensure that all requirements are addressed and can be reasonably implemented.	Consultant's Project Manager/ Sydney Metro Environment Manager/ Sydney Metro Senior Heritage Advisor	
<b>5</b>	<b>Notify the regulator, if required</b>		
5.1	Based on the advice and any statutory requirements, is notification to Heritage NSW and the Secretary required?  If no, proceed directly to Step 6.  If yes, proceed to next step.	Sydney Metro Environment Manager/ Sydney Metro Senior Heritage Advisor	



Step	Task	Responsibility	Guidance and tools
5.2	<p>If notification is required, provide the required information for a section 146 notification on the Heritage NSW Heritage Management System (HMS). The Environment Manager will provide the information to the Sydney Metro Senior Heritage Advisor who will lodge the notification via HMS.</p> <p>If the relic is uncovered when a section 139 (4) exception is being used, the section 146 notification must be sent to the Heritage Council of NSW via email.</p>	Sydney Metro Environment Manager and Senior Heritage Advisor	<a href="#">Heritage NSW notification requirements</a>
5.3	A copy of the final supporting information and Unexpected Heritage Item Recording Form must be kept on file and a copy sent to the Sydney Metro Project Manager.	Sydney Metro Environment Manager/ Contractor's Project Manager	
<b>6</b>	<b>Implement advice</b>		
6.1	The advice should be modified to take into account any additional advice resulting from notification and discussions with the regulator if required.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.2	Implement advice. Where impact cannot be avoided, this could include a formal assessment of heritage significance and impact assessment, preparation of excavation or recording methodologies, consultation with Registered Aboriginal Parties and obtaining heritage approvals if required.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	DECCW 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 DECCW 2010, Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW
6.3	Where heritage approvals are required, contact the Sydney Metro Environment Manager for further advice and support. Please note there are time constraints associated with heritage approval preparation and processing.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.4	For SSI or SSD projects, or projects approved under Part 5 of the EP&A Act, assess whether the heritage impact is consistent with the project approval or if project approval modification is required from the Department of Planning, Industry and Environment or the relevant consent authority.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.5	Where statutory approvals (or project modifications) are required, impact upon Aboriginal objects or relics must not occur until heritage and planning approvals have been issued by the appropriate regulator.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	

Step	Task	Responsibility	Guidance and tools
6.6	Where statutory approval is not required but where recording is recommended by the Excavation Director, archaeologist or Aboriginal cultural heritage consultant, sufficient time and resources must be allowed for this to occur.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.7	Ensure short term and permanent storage locations are identified for archaeological material or other heritage material recovered from site, where required. Interested third parties (for example local Aboriginal land councils, local councils or museums) should be consulted on this issue. Contact the Excavation Director, archaeologist or Aboriginal cultural heritage consultant for advice on this issue.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
<b>7</b>	<b>Resume work</b>		
7.1	Seek written clearance to resume project work from the Excavation Director, archaeologist or Aboriginal cultural heritage consultant.  Clearance would only be given once all archaeological excavation or heritage recommendations and approvals (where required) are complete. Resumption of project work must be in accordance with all the relevant project and heritage approvals/determinations.	Contractor's Project Manager	
7.2	If required, ensure archaeological excavation/heritage reporting and other heritage approval conditions are completed in the required timeframes. This includes artefact retention repositories, conservation and/or disposal strategies.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
7.3	If additional unexpected heritage items are discovered, this procedure must begin again from Step 1.	All	

## 4. Responsibilities

Table 3: Roles and responsibilities

Role	Responsibility
<b>Contractor/Supervisor</b>	<ul style="list-style-type: none"> <li>Stop work immediately when an unexpected heritage item is encountered. Cordon off area until Contractor Environmental Manager/Excavation Director, archaeologist or Aboriginal cultural heritage consultant advises that work can recommence.</li> <li>Manage the process of the identification, protection and mitigation of impacts on the heritage item.</li> <li>Liaise with the Sydney Metro Project Manager, Environment Manager and Senior Heritage Advisor.</li> <li>Assist the Excavation Director, archaeologist or Aboriginal cultural heritage consultant with mitigation and statutory requirements.</li> <li>Complete Incident Report and review CEMP for any changes that may be required. Proposed amendments to the CEMP if any changes are required.</li> </ul>
<b>Contractor's Project Manager</b>	Ensure all aspects of this Procedure are implemented. Advise the Contractor/Supervisor to recommence work if all applicable requirements have been satisfied and the Contractor Environmental Manager/ Excavation Director, archaeologist or aboriginal cultural heritage consultant has approved commencement of work.
<b>Contractor's Excavation Director/ archaeologist or Aboriginal cultural heritage consultant</b>	Provide expert advice to the Contractor and Sydney Metro Environment Manager on find identification, significance, mitigation, legislative procedures and requirements.
<b>Environmental Representative</b>	Ensure compliance with relevant approvals (new and existing) and the Construction Environment Management Plan.
<b>Sydney Metro Environment Manager</b>	Notify the Director Project Environment, Sustainability & Planning of find and help support Contractor with managing Incident Reporting.
<b>Sydney Metro Director Project Environment, Sustainability &amp; Planning</b>	Notify the Executive Director Environment, Sustainability & Planning of the find and management actions.
<b>Sydney Metro Senior Heritage Advisor</b>	Provide expert advice to Sydney Metro Environment Manager and project as required.

## 5. Seeking advice

Advice on this Procedure should be sought from the Sydney Metro Environment Manager in the first instance. Contractors and delivery partners should ensure their own project environment managers are aware of and understand this Procedure.

Technical archaeological or heritage advice regarding an unexpected heritage item should be sought from a suitably qualified and experienced archaeologist/Aboriginal heritage consultant.

## 6. Related documents and references

### Related documents and references

- [SM-20-00099495 Exhumation Management Procedure](#)
- [SM-17-00000096 Environmental Incident Classification and Reporting Procedure](#)
- [SM-21-00280658 Unexpected Heritage Find Recording Form](#)
- [SM-21-00280680 Archaeological Heritage Advice Checklist](#)
- [SM-21-00280708 Unexpected Heritage Discovery Notification Letter Template](#)
- 3TP-SD-015/7.0 Transport for NSW Guide to Environmental Control Map
- Roads and Maritime Services, November 2015, Unexpected Heritage Items Heritage Procedure 02
- [SM-17-00000203 Sydney Metro Glossary](#)
- Department of Environment, Climate Change and Water 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
- Department of Environment, Climate Change and Water 2010, Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW
- Heritage Branch Department of Planning 2009, Assessing Significance for Historical Archaeological Sites and 'Relics'
- Heritage NSW 2022, [Notify discovery of a relic](#), <  
<https://www.environment.nsw.gov.au/topics/heritage/apply-for-heritage-approvals-and-permits/historical-archaeology/notify-discovery-of-a-relic#:~:text=Under%20Section%20146%20of%20the,section%2060%20approval%20in%20place>>.

## 7. Superseded documents

### Superseded documents

There are no documents superseded as a result of this document.

## 8. Document history

Version	Date of approval	Notes
1.1	June 2017	Incorporates Environmental Representative comments
1.2	-	Amends p13 step 8 reference to s146
1.3	-	Incorporates Planning Mods 1-4 including amended CoA E20
1.4	March 2018	Incorporates Environmental Representative comments
2.0	-	Removes SSI 15-7400 COA reference
3.0	-	Revises definitions
3.1	-	Revises procedure
3.2	-	Revises roles and responsibilities
3.3	-	Minor edits and corrections
4.0	16 August 2021	Revises definitions and procedure; references the Sydney Metro Exhumation Management Procedure v5 with amendments throughout for consistency with that document. Updates to related documents and references.
5.0	24 April 2023	Minor clarifications and updates to the process for the notification of the discovery of a relic under section 146 of the <i>Heritage Act 1977</i> to address a change in Heritage NSW's process.

## Appendix A: Examples of unexpected heritage finds



Figure 2: Aboriginal stone artefacts found at the Wickham Transport Interchange, 2015



Figure 3: Aboriginal artefacts (shell material) found at the Wickham Transport Interchange, 2015



Figure 4: 1840s seawall and 1880s retaining wall uncovered at Balmain East, 2016



Figure 5: Sandstone pavers uncovered at Balmain East, 2016



Figure 6: Platform at Hamilton Station classified as a 'work' by the project archaeologist, Wickham Transport Interchange project, 2015



Figure 7: Sandstone flagging and cesspit, Wynyard Walk project, 2014



Figure 8: Chinese Ming Dynasty pottery and English porcelain/pottery dating back to the early nineteenth century, Wynyard Walk project, 2014



Figure 9: Pottery made by convict potter Thomas Ball during the early settlement period, Wynyard Walk project, 2014





Figure 10: Top left hand picture continuing clockwise: Stock camp remnants (Hume Highway Bypass at Tarcutta); linear archaeological feature with post holes (Hume Highway Duplication), animal bones (Hume Highway Bypass at Woomargama); cut wooden stake; glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area)



Figure 11: Culturally modified stone discovered on Main Road 92, about two kilometres west of Sassafras. The remaining images shown a selection of stone artefacts retrieved from test and salvage archaeological excavations during the Hume Highway Duplication and Bypass projects from 2006-2010

## Appendix B: Unexpected heritage find recording form

Refer to [SM-21-00280658 Unexpected Heritage Find Recording Form](#).

## Appendix C: Photographing unexpected heritage items

Photographs of unexpected finds in their current context (*in situ*) may assist archaeologists/Aboriginal heritage consultants to better identify the heritage values of the item. Emailing good quality photographs to specialists can allow for better quality and faster heritage advice. The key elements that must be captured in photographs of the item include its position, the item itself and any distinguishing features. All photographs must have a scale (ruler, scale bar, mobile phone, coin etc.) and a note describing the direction of the photograph.

### C1: Context and detailed photographs

It is important to take a general photograph (below left) to convey the location and setting of the item. This will add value to the subsequent detailed photographs also required (below right – labelled Figure 2).

**Removal of the item from its context (e.g. excavating from the ground) for photographic purposes is not permitted.**

### C2: Photographing distinguishing features



**Figure 2:** Close up detail of the sandstone surface showing material type, formation and construction detail. This is essential for establishing date of the feature.

Where unexpected items have a distinguishing feature, close up detailed photographs must be taken of these features, where practicable. In the case of a building or bridge, this may include diagnostic details architectural or technical features. See images next page, labelled Figures 3 and 4 for examples.



Figure 3: Ceramic bottle artefact with stamp.



Figure 4: Detail of the stamp allows 'Tooth & Co Limited' to be made out. This is helpful to a specialist in gauging the artefact's origin, manufacturing date and likely significance.

### C3: Photographing bones

The majority of bones found on site will be animal bones often requiring no further assessment (unless they are in archaeological context). However, if bones are human, the police must be contacted immediately (see [Appendix E](#) for detailed guidance). Taking quality photographs of the bones can often resolve this issue quickly. The project archaeologist can confirm if bones are human or non-human if provided with appropriate photographs.

Ensure that photographs of bones are not concealed by foliage (example below left, labelled Figure 5) as this makes it difficult to identify. Minor hand removal of foliage can be undertaken as long as disturbance of the bone does not occur. Excavation of the ground to remove bone(s) should not occur, nor should they be pulled out of the ground if partially exposed.

Where sediment (adhering to a bone found on the ground surface) conceals portions of a bone (example below right, labelled Figure 6) ensure the photograph is taken of the bone (if any) that is not concealed by sediment.



Figure 5: Bone concealed by foliage.



Figure 6: Bone covered in sediment

Ensure that all close up photographs include the whole bone and then specific details of the bone (especially the ends of long bones, the *epiphysis*, which is critical for species identification). The images below (labelled Figure 7, left and Figure 8, right) are examples of good photographs of bones that can easily be identified from the photograph alone. They show sufficient detail of the complete bone and the epiphysis.



Figure 7: Photograph showing complete bone.



Figure 8: Close up of a long bone's epiphysis.

## Appendix D: Archaeological/heritage advice checklist

Refer to [SM-21-00280680 Archaeological Heritage Advice Checklist](#)





# Exhumation Management Procedure

SM-20-00099495 (formerly SM ES-PW-315)

Metro Body of Knowledge (MBoK)

<b>Applicable to:</b>	Sydney Metro
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<b>Digital Signature:</b>	



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# 1. Introduction

Sydney Metro has developed this Exhumation Management Procedure (ExMP) to provide guidance for managing the discovery of human skeletal remains during the course of works. The procedure is applicable to both unexpected skeletal finds and controlled archaeological investigations where human remains are anticipated.

The procedure is applicable to all stages of any Sydney Metro project and to all staff and contractors.

Sydney Metro is Australia's biggest public transport project. By 2030, Sydney will have a network of four metro lines, 46 stations and 113km of new metro rail.

Sydney Metro is revolutionising how Australia's biggest city travels, connecting Sydney's north west, west, south west and greater west to fast, reliable turn-up-and-go metro services with fully accessible stations.

The metro program includes the operational Metro North West Line and three projects under construction:

- City & Southwest
- West
- Western Sydney Airport

The purpose of this ExMP is to provide a clear and concise process to follow in the event of the discovery of potential human remains during Sydney Metro activities.

This ExMP will be reviewed as required and prior to any future Sydney Metro project that has potential to impact on known burials, graves, cemeteries or burial grounds. A review may require amending the ExMP to tailor additional controls or management procedures that are specific to the impacted cemetery or burial ground. In addition, the requirements of the relevant Planning Approval will be assessed during the review of this ExMP prior to its implementation.

This ExMP should be read in conjunction with [SM-20-00099497 Unexpected Heritage Finds Procedure](#).

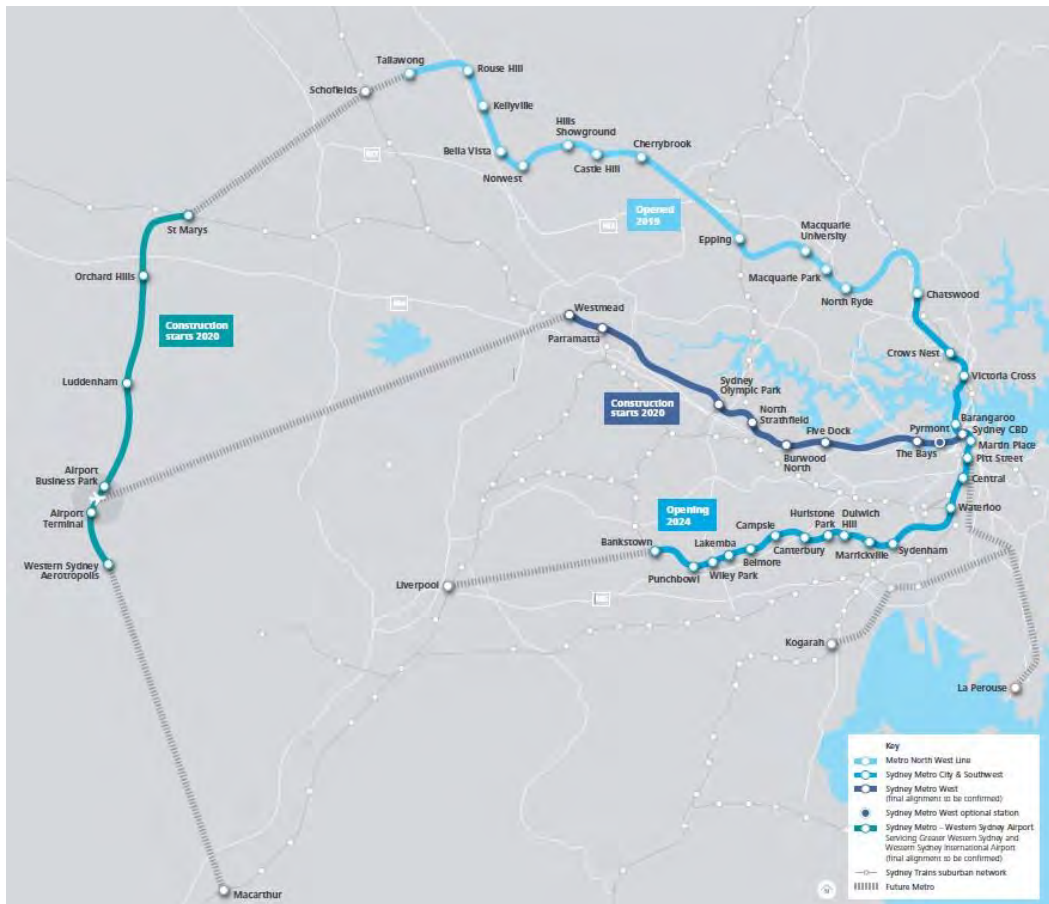


Figure 1: Sydney Metro overview and station locations

## 1.1. Purpose and scope

This ExMP outlines the procedure for the management of the discovery of human remains within the Sydney Metro program. It includes:

- Overview of legislative requirements for dealing with human remains (e.g. *Coroners Act 2009*, *Heritage Act 1977*, *Guidelines for the Management of Human Skeletal Remains 1988*, and the *Public Health Regulations 2022*).
- A flow chart process to be followed when human remains are uncovered.
- An archaeological methodology for the excavation of remains including processes for appropriately handling remains in accordance with the relevant guidelines (see section 2.3 and 2.4 below).
- Post-exhumation management processes including relocation, processing and long-term arrangements.
- Process for nomination of a physical anthropologist and temporary storage location.
- Process for additional analysis including DNA testing, isotope analysis and environmental sampling, and discussion on requirements for public involvement.

## 2. Overview of legislative requirements for dealing with human remains

The following section provides an overview of the legislation that would apply to the discovery, management and relocation of human remains. A discovery of suspected human remains may be subject to different Acts and requirements, thereby triggering different notification pathways based on the specific circumstances involved.

The first step will always be to notify the NSW Police. Confirmation of the age (antiquity) and nature of the skeletal remains as well as the reasons for the disturbance will dictate which Act and provisions will be applicable.

### 2.1. Discovery of human remains and forensic cases: *NSW Coroners Act 2009*

For a discovery of suspected human remains less than 100 years old, the remains would come under the jurisdiction of the State Coroner and the *NSW Coroners Act 2009*. Such a case would be considered a 'reportable death' and, under legal notification obligations set out in s35 (2); a person must report the death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old, regardless of ancestry (i.e. both Aboriginal and non-Aboriginal remains).

#### *35 Obligation to report death or suspected death*

- (1) *This section applies to any person who has reasonable grounds to believe that a death or suspected death of another person:
  - (a) is a reportable death or occurred in circumstances that would be examinable under Division 2 of Part 3.2, and
  - (b) has not been reported in accordance with subsection (2).*
- (2) *A person to whom this section applies must report the death or suspected death concerned to a police officer, a coroner or an assistant coroner as soon as possible after becoming aware of the grounds referred to in subsection (1).*

*Maximum penalty (subsection (2)): 10 penalty units.*
- (3) *A police officer to whom a death or suspected death is reported under this section is required to report the death or suspected death to a coroner or assistant coroner as soon as possible after the report is made.*
- (4) *An assistant coroner to whom a death or suspected death is reported under this section is required to report the death or suspected death to a coroner as soon as possible after the report is made.*
- (5) *A coroner to whom a death or suspected death is reported under this section is required to inform the State Coroner of the report as soon as practicable after the report is made.*

## 2.2. Historic human remains: *Heritage Act 1977 and Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977*

The *Heritage Act 1977* (Heritage Act) and *Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977*<sup>1</sup> (the Guidelines) apply to historic burials in New South Wales. It should be noted that the Guidelines are outdated in terms of the current statutory framework.

A relic is defined as an archaeological deposit or artefact that has heritage significance at a local or State level. The guidelines, *Assessing Significance for Historical Archaeological Sites and Relics*<sup>2</sup>, have been endorsed by the Heritage Council of NSW and should be used to assess the level of heritage or archaeological significance of the remains. With reference to burial grounds, objects such as headstones, grave enclosures and grave goods, as well as buried human remains, may be 'relics' under the Heritage Act.

Approval under the Heritage Act and the *National Parks and Wildlife Act 1974* (NPW Act) is not required if human remains are uncovered during a Critical State Significant Infrastructure (CSSI) project. However, notification to the Heritage Council under s146 of the Heritage Act, and notification of an Aboriginal object under the NPW Act is required if human remains are uncovered during archaeological or other project related investigations.

## 2.3. Aboriginal human remains: *National Parks and Wildlife Act 1974*

The NPW Act, administered by Heritage NSW, provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 84.

Discovery of Aboriginal burials and/or human remains would be addressed in the projects Aboriginal Cultural Heritage Assessment Report (ACHAR). ACHARs would be prepared in accordance with the following Heritage NSW guidelines:

- *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*<sup>3</sup>;
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*<sup>4</sup>;
- *Aboriginal cultural heritage consultation requirements for proponents 2010*<sup>5</sup>,
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*<sup>6</sup>.

If suspected human skeletal remains are uncovered at any time during the archaeological management program, the process outlined in this ExMP and detailed in the flow chart is to

<sup>1</sup> NSW Heritage Office, 1998.

<sup>2</sup> Heritage Branch of the Department of Planning, 2009.

<sup>3</sup> NSW Department of Environment and Conservation, 2005.

<sup>4</sup> Office of Environment and Heritage, 2011.

<sup>5</sup> Department of Environment, Climate Change and Water, 2010.

<sup>6</sup> Office of Environment and Heritage, 2010.

be followed. Management of the remains would be guided by consultation with the nominated Registered Aboriginal Parties (RAPs) for the project, in adherence to the ACHAR.

## 2.4. Exhumation of human remains: *Public Health Regulation 2022 (NSW)*

The *Public Health Regulation 2022* provides specific regulation for the exhumation of human remains in NSW.

Under Clause 95 of the Regulation, an application for approval to exhume the remains of a dead person may be made to the Secretary via an approved form to the Local Public Health Unit delegated to act on behalf of the Secretary.

Refer to Appendix 1 for a copy of the approved form.

## 2.5. *Work Health and Safety Act 2011*

The *Work Health and Safety Act 2011* provisions apply to protect personnel involved in the exhumation procedure by creating and maintaining safe and healthy work practices and are enforced by WorkCover NSW. Graves, crypts and vaults could be considered to be confined spaces in some circumstances under health and safety legislation. More information on safe work practices is available at or by contacting SafeWork NSW via their website or directly.

Health and safety aspects of working with human remains should be considered. Generally, working with archaeological human skeletal remains requires no extra precautions to be taken beyond normal health and safety regulations. Once any necessary site health and safety precautions have been taken, the exhumation of human remains can proceed.

# 3. Procedure for the discovery and management of human remains

This procedure provides project managers, principal contractors and the Project Excavation Director with advice on the steps to follow when suspected human remains are uncovered. Information on the potential for burials and human remains where known would be included in the general project induction for all personnel. The general project induction would also include the procedure to manage human remains set out in this ExMP.

## 3.1. Initial discovery of bones: What do we do?

To avoid doubt, all suspected bone items must be treated as potential human skeletal remains, and work in the immediate vicinity must stop while they are protected and investigated as a matter of urgency.

### 3.1.1. Stop Work and preliminary notification

If bone is uncovered, all work in the vicinity of the find must stop to allow for a positive identification as either human or non-human bone.

The Project Excavation Director must be notified.

Where required, preliminary notification must be made to the NSW Police in compliance with Section 35 of the *Coroners Act 2009* (also refer to special conditions for Central Station noted in section 4).

<b>What?</b>	When bones are uncovered at a site, all work in the area of the find must <b>stop immediately</b> and the site must be secured.
<b>Who?</b>	The discoverer will <b>immediately</b> notify machinery operators so that no further disturbance of the remains will occur, as well as notifying the foreman/site supervisor, principal contractor, project archaeologist/Excavation Director and Sydney Metro Environmental Manager. Where required, preliminary notification to the NSW Police will be undertaken by the Sydney Metro Environment Manager in consultation with the Sydney Metro Senior Heritage Advisor and Excavation Director. Notification should provide verbal description of the remains and inform the police that consultation with technical specialists is being undertaken to confirm that the remains are human, as well as the burial context (archaeological or less than 100 years old, refer Step 2).
<b>How?</b>	Inform all site personnel of restricted access to the area of the discovery and no work to proceed until further notice. Area must be fenced off (flagging or temporary exclusion fencing).
<b>Actions</b>	Notify site supervisor, principal contractor, project archaeologist/Excavation Director and Sydney Metro Environmental Manger and Senior Heritage Advisor of the find and protect the suspected remains until an initial assessment can be undertaken by a technical specialist. Preliminary notification to NSW Police by Sydney Metro Environmental Manager.

### 3.1.2. Confirm the remains are human

Skeletal remains could either be articulated and in a recognisable form of burial such as a coffin or common burial position of the body (e.g. supine, prone or flexed), or they could be disarticulated or fragmented remains. Within the boundaries of a known historic burial ground, there is a high probability of the remains being human. In a suspected forensic case (less than 100 years old), the remains may have clothing and/or human tissue. Disarticulated or fragmented bones are often uncovered, and these may require specialist assessment to determine legal jurisdiction.

If suspected human remains are identified during the project, preliminary notification must be made to the NSW Police in compliance with Section 35 of the *Coroners Act 1999* (refer Step 1). NSW Police would be contacted immediately upon receipt of confirmation of human provenance.

<b>What?</b>	Confirmation that the remains are human, their burial context - whether they are forensic (less than 100 years) or archaeological (older than 100 years) and suspected ancestry (Aboriginal or non-Aboriginal).
<b>Who?</b>	Excavation Director and or Forensic or physical anthropologist, or archaeologist with specialist skills such as an osteoarchaeologist. Notification to the NSW Police will be undertaken by the Sydney Metro Environmental Manager.
<b>How?</b>	Consultation could be undertaken as either an on-site inspection or via good quality photos sent to the nominated technical specialist of 1) the remains; and 2) the site general site location of the discovery.



<b>Actions</b>	<p>Contact nominated technical specialists to confirm that the remains are: a) human, b) burial context (archaeological or forensic), and c) suspected ancestry (Aboriginal or non-Aboriginal).</p> <p>For the duration of the Sydney Metro project, the nominated technical specialists are:</p> <ul style="list-style-type: none"> <li>• Forensic Anthropologist – TBC by contractor for project area.</li> <li>• Nominated Excavation Director – TBC by contractor for project area.</li> <li>• Sydney Metro Environmental Manager to conduct and or oversee liaison with NSW Police.</li> </ul> <p>The archaeologist may be able to identify the nature of remains without input from the Forensic Anthropologist. The Forensic Anthropologist should be contacted as required.</p>
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### 3.1.3. Notification based on jurisdiction (forensic or archaeological)

Once confirmation is received from the technical specialist that the remains are of human origin, there are three possible statutory pathways to follow based on the assessment.

<b>What?</b>	Forensic case: remains are less than 100 years old
<b>Who?</b>	If it is determined by specialist assessment (Step 2) that the remains are forensic, the remains come under the jurisdiction of the State Coroner and the Coroners Act 2009.
<b>How?</b>	The NSW Police would likely secure the site and will advise on the procedure to be followed.
<b>Actions</b>	Environmental Manager to liaise with NSW Police

<b>What?</b>	Archaeological – non-Aboriginal human remains – more than 100 years old.
<b>Who?</b>	Follow the Archaeology Exhumation Methodology as set out in Step 4 below
<b>How?</b>	Follow the Archaeology Exhumation Methodology as set out in Step 4 below
<b>Actions</b>	Follow the Archaeology Exhumation Methodology as set out in Step 4 below

<b>What?</b>	Archaeological – suspected Aboriginal human remains – more than 100 years old.
<b>Who?</b>	Recording of Aboriginal ancestral remains must be undertaken by, or conducted under the direct supervision of a specialist with registered Aboriginal parties (RAPs) present.
<b>How?</b>	The RAPs must be present where it is reasonably suspected that Aboriginal burials or human remains have been encountered.
<b>Actions</b>	Notify RAPs and Heritage NSW and follow the Aboriginal cultural heritage assessment report (ACHAR). Follow the Archaeology Exhumation Methodology as set out in Step 4.

## 3.2. Archaeological exhumation methodology

The following section provides a broadly accepted archaeological methodology for exhumation and the appropriate handling of human remains.

### 3.2.1. Securing the site

The strategy for the excavation and removal of human remains must be sensitive to public opinion and ethics and exhumation activities should not be visible to the general public. The site may need to be screened off from public areas, not only with hoarding but also in some cases with a roof to screen the site off from overlooking buildings. At all times, human remains should be treated respectfully. The perimeter of the excavation site should be demarcated by

plastic tape or flagging, with only technical staff allowed within this area for the duration of exhumation activities.

The site should be protected from the elements including flooding, contamination with dust or debris, and other disturbance. These measures would be formulated by the Excavation Director in consultation with the contractor and Sydney Metro where required and may differ from site to site.

### 3.2.2. Excavation Director

Archaeological investigations are to be managed by a suitably qualified Excavation Director with experience in the excavation and management of human remains. For sites with potential for locally significant remains, the Excavation Director should meet the NSW Heritage Council criteria for experience with locally significant archaeological sites. For sites with potential for State significant archaeology the Excavation Director should meet the Heritage Council of NSW criteria for experience with State significant archaeological sites.

### 3.2.3. Excavation and recording

Exhumation and recording are to be undertaken in accordance with best practice forensic and Heritage Council of NSW guidelines. Prior to removal, the remains should be fully recorded in situ to understand their surrounding archaeological context. This will include recording any disturbances to the burial and the identification of bones present. In some cases, the deposit of bones may be a mixture of articulated and disarticulated remains. Care should be taken to distinguish articulated remains and to assess if they represent commingled individuals or disturbed remains belonging to one individual, and to record them accordingly.

### 3.2.4. Recording

- A standard context recording system is to be employed.
- Detailed survey and/or measured drawings are to be prepared and include location of remains within the overall site (position of the body, the direction of the burial, noting any stratigraphic relationships with other archaeological features).
- Any associated artefacts (potential grave goods, burial furniture) are to be recorded and collected by context for later analysis.
- Photographic record of all phases of work in accordance with 'Photographic Recording of Heritage Items Using Film and Digital Capture'. Photographs are to be in RAW format, using photographic scales and photo boards where appropriate.
- Registers of contexts, photos, samples and drawings are to be kept.

### 3.2.5. Excavation

- Detection of the extent of the grave/remains (if disarticulated).
- Surface soils removed in excavation units of 100mm (site dependent) using small hand tools.
- Expose remains with soft paint brushes and pedestal the remains.

- Record position and depth of remains.
- Soil removed is to be sieved through 3mm mesh to examine for teeth and bone fragments.

Soil samples may be taken from the abdominal and/or chest areas of the body (articulated remains) to retrieve further evidence.

- Exhumation must be under the control of the Excavation Director, with the assistance of a Forensic Anthropologist if required. Exhumation permit/s, provided by NSW Ministry of Health may also require the presence of an authorised officer or a member of staff of the Ministry of Health.
- Further excavation of the bottom of the pit (grave) following removal to confirm the absence of further remains.

### 3.2.6. Relocation of bones

Removal and collection of skeletal remains is to follow the standard forensic practice of labelling as follows:

- Remove remains from the ground systematically and place in plastic bags according to anatomical areas of the body.
- Bags should not be air-tight and should have ventilation holes to prevent deterioration of fragile skeletal material. Each bag should contain labels and the separate bags should then be placed in a large plastic bag, crate or box, labelled with the context information.
- The remains should be placed in a sturdy, large cardboard box (approximately 600 x 300 x 200 mm) for relocation to off-site processing location.

### 3.3. Resume work

Construction work may only recommence upon receipt of clearance certificate from the Excavation Director and may require additional NSW Ministry of Health approval. If a forensic case, written authorisation from the NSW Police is required.

### 3.4. Reporting

A report would be prepared following the completion of the program of exhumation works, separate to the archaeological excavation report for the project. This report would include skeletal analysis catalogue, comprehensively describe the process of exhumation, detail the recording of the remains and synthesise the results of any further laboratory testing. An assessment of significance for the remains would be provided and interpreted within the context of the archaeological research design (response to research questions).

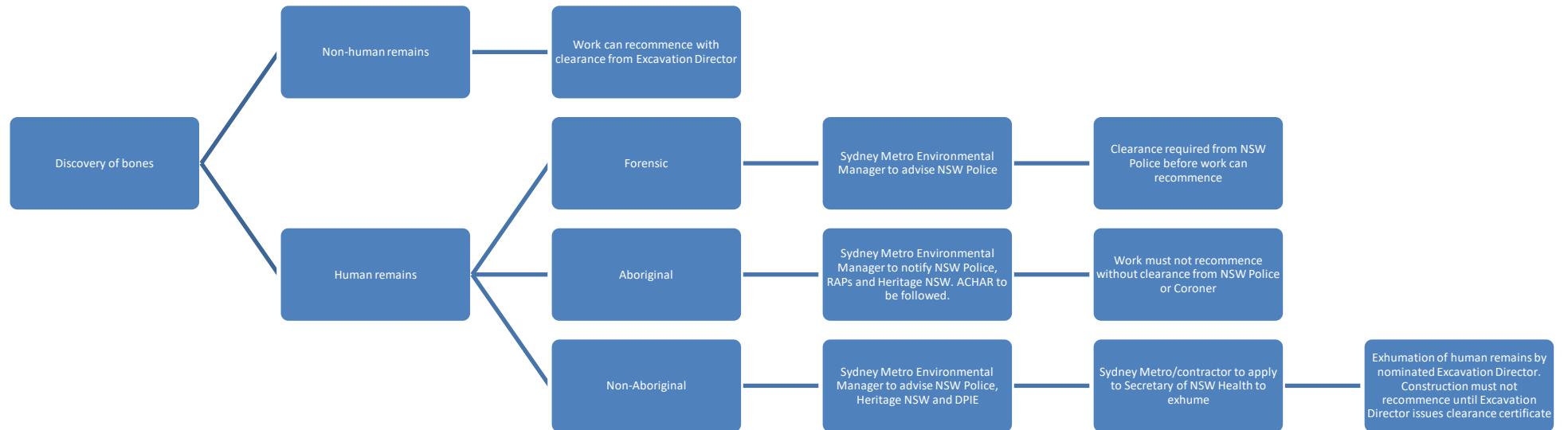


Figure 2: Exhumation procedure flow chart

## 4. Excavation and post-excavation tasks

All on-site management should be in accordance with the archaeological research design (ARD) and relevant archaeological method statement (AMS), and be overseen by the Excavation Director. The Excavation Director would nominate a Forensic Anthropologist where required.

### 4.1. Research questions

Research questions should be specific to the site and the site history. The research questions in the archaeological research design can be revised as new information emerges and new research questions can be investigated.

The following general research questions can be used to guide exhumations, should intact burials, disarticulated remain, burial cuttings or associated material culture be uncovered during work.

#### 4.1.1. Social history and burial practices

- Does the location of the burial/burial cutting correspond with historic plans/descriptions?
- Is there evidence of exhumation?
- Do graves cut into older ones? What can this tell us about nineteenth century burial practices, and how does this compare to other excavated cemetery sites in the region?
- What is the distance between burials (if multiple burials uncovered)? Does this conform to known nineteenth century burial practices?
- What type of fill was used within grave cuttings? What can this tell us about the surrounding environment and burial practices at the time?
- What materials/tree species were used in the coffin manufacture? Can coffin manufacturing techniques or fastening methods (use of mortar, screws, nails, tacks) be identified? Does this match known burial practices of the time? If alternative methods are identified, what can this tell us about the manufacturer or economic/social landscape?
- Can the class or rank of the individual be identified via coffin materials, grave goods or clothing/shrouds?
- Which direction is the burial orientated? How does this correspond with the known/hypothesised location of denomination areas?
- If the burial is associated with more than one individual, can a familial relationship be assessed through DNA or other genetic markers identifiable within the skeletal remains?

### 4.1.2. Environmental factors and scientific analysis

- What is the condition of the bones? How does their condition compare to known or nearby burials of the same age? What environmental or human factors may have influenced the decomposition process?
- Can the health, nutrition, sex, race, stature or age be identified through the skeletal remains? Is there evidence of trauma on the bones? Is there evidence of pathology on the bones (e.g. syphilis, tuberculosis, tumours)?
- Can stable isotope analysis address any questions regarding diet, country of origin and nutrition?
- Can DNA testing address any questions not answerable by the skeletal remains themselves, such as sex, familial relationships (if buried with another individual/s) or race?
- Is there potential for DNA to be tested against any individuals who may come forward as a descendant of the deceased?

## 4.2. Process for DNA testing, isotope analysis and environmental sampling

### 4.2.1. Pre-excavation

The Excavation Director, in consultation with the Forensic Anthropologist, will nominate a suitable laboratory prior to works commencing. Requirements for DNA testing, isotope analysis and environmental sampling will be identified in the archaeological research design and archaeological method statement.

### 4.2.2. Excavation

To prevent cross-contamination, the following sample collection and excavation process should be followed:

- The location, quantity and material (bone, teeth, hair, soil, wood) of samples will be determined by the Excavation Director or Forensic Anthropologist prior to its collection.
- Samples would be stored in a safe, secure and climate controlled location while excavations are in progress. This would be chosen by the Excavation Director or Forensic Anthropologist on site.
- Each collected sample would be given a unique catalogue number and a sample register would be recorded throughout the excavation.

- ‘Clean excavation’ procedures would be followed during the excavation of burials and during the sample collection process<sup>7</sup>. This would include:
  - Latex gloves would be worn by individuals excavating and/or handling bone or soil samples. Gloves would be changed for each bone and/or individual to prevent cross-contamination;
  - Excavation tools/brushes would be cleaned prior to and after the collection of each sample to prevent cross-contamination;
  - In some cases, a face mask would be worn when samples for DNA analysis are being collected;
  - Bone samples for DNA testing would be collected with surrounding in situ soil and should not be cleaned prior to bagging;
  - It may be necessary for individuals involved in sample collection to submit DNA for comparison in the event of cross-contamination; and
  - All bags containing samples for analysis would be bagged and labelled appropriately to prevent cross contamination and ensure they are handled and stored correctly.

#### 4.2.3. Post-Excavation

On completion of excavations, samples will be transported to nominated laboratories for analysis. A record of their location will be kept.

### 4.3. Reporting

The results of the investigation of human remains and the exhumation will be included in the archaeological reporting for the project in accordance with the project ARD.

Once finalised, and where it is appropriate to do so as determined in consultation with RAPs and/or as may be required by the relevant planning approval obligations, archaeological and associated specialist reports should be submitted to:

- The relevant local council and library;
- Heritage NSW library;
- The State Library of NSW; and
- Made available online for public access and educational purposes.

Further, if significant remains are identified during excavations, the results and findings would be published in academic journals and conference papers where feasible.

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<sup>7</sup> Guidelines for ‘clean excavation’ are based on procedures outlined in: Yang, D. Y. & Watt, K. 2005. Contamination controls when preparing archaeological remains for ancient DNA analysis. *Journal of Archaeological Science*, vol. 32, pp. 331–336 and *Society for Historical Archaeology*, 2015–2017. Research and Analysis of Artefacts. Accessed online at: <https://sha.org/conservation-facts/faq/analysis/#C> on 25/5/2017.

## 4.4. Public involvement

Archaeological excavations may uncover remains directly associated with early settlement and burial practices. Such remains are likely to generate public interest.

Public involvement may include:

- Seeking descendants of identified individuals to consult on appropriate actions and reburial proposals
- Media releases;
- Public Open Days;
- Preparation of brochures detailing the archaeological excavations;
- Interpretive signage and online blog posts or site diaries while excavations are taking place; and
- The preparation of a Heritage Interpretation Plan designed to provide interpretation of the site within the new development upon the completion of works.

Due to sensitive nature of human skeletal remains, these recommendations would be adapted and modified as appropriate under the direction of Sydney Metro and the Excavation Director.

Such recommendations would also be considered and require approval from relevant stakeholder groups such as known or potential descendants of the deceased, Heritage NSW/Heritage Council of NSW, local Council and interest groups.

## 4.5. Temporary storage and permanent repository or resting place for remains

### 4.5.1. Temporary storage

Upon the completion of archaeological excavations, skeletal remains should be boxed separately and temporarily stored within a safe, secure controlled environment to allow for further analysis of the remains. This location would be chosen by the Excavation Director and the Forensic Anthropologist and would comply with NSW legislative requirements.

### 4.5.2. Permanent repository or resting place for remains

A permanent repository or resting place for remains is dependent on the nature and volume of skeletal remains. Final arrangements would be dictated by Sydney Metro, the Excavation Director, Forensic Anthropologist, identified descendants of the deceased, RAPs (if applicable) and/or other stakeholders upon the completion of excavations and subsequent analysis.



## 5. Definitions

All terminology in this Procedure is taken to mean the generally accepted or dictionary definition. Acronyms and terms specific to this document are listed below.

Other terms and jargon are defined within the [SM-17-00000203 Sydney Metro Glossary](#).

	Definitions
<b>IMS</b>	Integrated Management System (IMS)
<b>TfNSW</b>	Transport for New South Wales
<b>RAP</b>	Registered Aboriginal party
<b>ACHAR</b>	Aboriginal cultural heritage assessment report
<b>ARD</b>	Archaeological research design
<b>AMS</b>	Archaeological method statement
<b>OEH</b>	Office of Environment and Heritage (now Heritage NSW)
<b>PHU</b>	Public Health Unit
<b>ExMP</b>	Exhumation Management Procedure (this Procedure)
<b>ER</b>	Environmental Representative (independent)

## 6. Accountabilities

The Executive Director, Environment, Sustainability & Planning is accountable for this Procedure including approving the document and monitoring its effectiveness. The Senior Advisor Heritage is responsible for overseeing the implementation of this Procedure, and performing a formal review of the document.

Direct Reports to the Chief Executive are accountable for ensuring the requirements of this Procedure are implemented within their area of responsibility.

Direct Reports to the Chief Executive who are accountable for specific projects/programs are accountable for ensuring associated contractors comply with the requirements of this Procedure.

## 7. Related documents and references

### Related documents and references

- [SM-20-00099497 Unexpected Heritage Finds Procedure](#)
- [NSW Health Application to Exhume Human Remains](#)
- Department of Environment, Climate Change and Water 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
- Department of Environment, Climate Change and Water 2010, Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW

## 8. Superseded documents

### Superseded documents

There are no documents superseded as a result of this document.

## 9. Document history

Version	Date of approval	Notes
1.1	May 2017	New IMS document.
2.0	July 2017	Incorporates Stage 2 (section 3)
2.1	February 2019	Extended for Metro Program wide application, includes changes specific Central Station management, and incorporates comments received from the State Coroner's Office, NSW Police, NSW Health, and Sydney Metro Environmental, Environmental Representatives engaged on the Central site and the Office of Environment and Heritage (OEH).
2.2	February 2019	Incorporates comments received from Artefact Heritage and Dr Denise Donlon issued to Health and OEH Heritage Division for consultation.
3.0	May 2019	Incorporates Health, Coroner and OEH comments.
4.0	April 2020	Updates to remove specific references to City and South West and Central Station. Change of title to "Procedure". Update to references.
5.0	16 August 2021	Updates to related documents and references.
6.0	December 2022	Minor clarifications to the procedure.


# Appendix A: NSW Health Application Form to Exhume Human Remains

For a copy of the form see [NSW Health Application to Exhume Remains](#).

NSW Health Form

## Application to Exhume Remains

Public Health Regulation, 2022 Section 95



In accordance with the requirements of Section 95(2) of the Public Health Regulation 2022,

I, \_\_\_\_\_  
*(Full name of applicant)*

of \_\_\_\_\_  
*(Address)* hereby

apply for permission to exhume the remains of the late \_\_\_\_\_  
*(Name of deceased)*

from Grave No: \_\_\_\_\_, Section \_\_\_\_\_, being a single interment within the \_\_\_\_\_ Cemetery, for the purpose of \_\_\_\_\_

I seek permission to exhume for the following reason/s:

The deceased:

was not known to be infected with a prescribed infectious disease as defined in Section 79 of the Public Health Regulation 2022; **OR**

was known to be infected with a prescribed infectious disease as defined in Section 79 of the Public Health Regulation 2022

I am entitled to make this application because I am: (tick one)

The executor of the estate of the deceased; **OR**

The nearest surviving relative of the deceased; **OR**

If there is no executor or relative available to make the application, a proper person can make the application for the reasons set out below:

*(Full reasons for proper person to make application)*

1/2

NSW Health **Application to Exhume Remains** Form  
Public Health Regulation 2022 Section 95

Attached are:

- A certified copy of the death certificate of the deceased issued under the Births Deaths and Marriages Registration Act 1995.
- A statutory declaration as to:
  - My relationship to the deceased; and
  - the wishes of the deceased regarding the disposal of the body (if known);
  - the reasons why the Secretary may consider me the proper person in all circumstances to make the application (if applicable)
- The application fee of \$ \_\_\_\_\_

**The exhumation is to be supervised in strict accordance with the attached Plan of Management**

by \_\_\_\_\_

employed with \_\_\_\_\_  
*(Funeral Director/Cemetery)*

in the capacity of \_\_\_\_\_

Signature of applicant: \_\_\_\_\_

Date: \_\_\_\_\_

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## **Appendix 3: Community Notification.**

(Monthly newsletter)

## Julia Diamond

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**From:** Systems Connect Community Team <LinewideMetro@transport.nsw.gov.au>  
**Sent:** Tuesday, 12 September 2023 5:23 PM  
**To:** Julia Diamond  
**Subject:** Northern Connection and Chatswood Dive monthly update

**CAUTION:** This email is sent from an external source. Do not click any links or open attachments unless you recognise the sender and know the content is safe.



**City & Southwest**

Good afternoon,

I hope my email finds you well.

The Systems Connect project team would like to thank our neighbours for their patience while we successfully completed the Nelson Street stormwater connection work this week.

In preparation for the demobilisation of the logistics shed and removal of the hoarding, next week the Systems Connect team will commence scaffolding installation along Nelson Street and the corner of Pacific Highway. The work involves taking up the south-west side of the Nelson Street footpath and on-street parking from 18 of September, for the duration of approximately two months. Scaffolding installation and shed demobilisation will take place between 7am and 6pm Monday to Friday, and 8am to 6pm on Saturday. For the safety of the community and our workers, a part of the scaffolding at the intersection of Nelson Street and Pacific Highway will be constructed outside standard construction hours and will require partial lane closure on Pacific Highway with traffic and pedestrian management in place. Details of the work will be provided via our email updates.

Systems Connect work on Nelson Street cul-de-sac and Frank Channon Walk extension will commence in early October. Nelson Street southern footpath will remain closed for the duration of the work. I will keep you updated on the progress of work.

Next week at Chatswood Dive site, site maintenance, surveying and environmental investigation work will continue. Between 1am on Saturday 23 September and 11:59pm on Sunday 24 September, the Systems Connect team will carry out preparation work for the hi-rail pad installation at the tunnel entry level. The remaining of the hi-rail pad installation work will be

undertaken during October, over up to four consecutive weekends. Details of the work will be provided in our October monthly notification and via our email updates.

Some of the work may be noisy at times. Highly impacted residents will be notified separately. Every effort will be made to reduce the noise and disruption. The Systems Connect team thanks you for your ongoing patience and support while we complete this important work.

If you have any questions about upcoming work at Northern Connection or Chatswood Dive, please call **1800 171 386** (24-hour community information line) and ask for the Systems Connect team or email

[linewidemetro@transport.nsw.gov.au](mailto:linewidemetro@transport.nsw.gov.au)

Hubavina and the Systems Connect Team

**Community Relations Team**  
**Sydney Metro City & Southwest**

- 📞 **1800 171 386** Community information line open 24 hours
- ✉️ [sydneymetro@transport.nsw.gov.au](mailto:sydneymetro@transport.nsw.gov.au) (responses during business hours only)
- 📦 **Sydney Metro City & Southwest**, PO Box K659, Haymarket NSW 1240
- 🗣️ If you require the services of an interpreter, please contact the Translating and Interpreting Service on **131 450** and ask them to call Sydney Metro on **1800 171 386**. The interpreter will then assist you with translation.

หากท่านจำเป็นต้องใช้บริการล่าม โปรดติดต่อบริการแปลและล่าม Translating and Interpreting Service ที่ 131 450 และขอข้อมูลหน่วยงานดังกล่าวโทรหา Sydney Metro ที่ 1800 171 386 หลังจากนี้ ทีมงานจะช่วยท่านเกี่ยวกับการแปล

Если Вам необходима помощь переводчика, свяжитесь, пожалуйста, с переводческой службой Translating and Interpreting Service по телефону 131 450 и попросите их соединить Вас с Сидней Метро (Sydney Metro) по номеру 1800 171 386. Затем переводчик поможет вам с переводом

Εάν χρειάζεστε τις υπηρεσίες διερμηνέα, παρακαλείστε να επικοινωνήσετε με την Υπηρεσία Μετάφρασης και Διερμηνέων στο 131 450 και ζητήστε τους να καλέσουν το Sydney Metro στο 1800 171 386. Ο διερμηνέας θα σας βοηθήσει στη μετάφραση.

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## **Appendix 4: Nation Partners Chatswood Pre-Remediation Investigation Sampling Analysis & Quality Plan (SAQP) inc. Sydney Metro Unexpected Heritage Finds Procedure**



4 August 2023

# Chatswood Pre- Remediation Investigation Sampling Analysis & Quality Plan (SAQP)

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### Document title

Chatswood Pre-Remediation Investigation -  
Sampling Analysis & Quality Plan (SAQP)

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### Version

3.0

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### Date

4 August 2023

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### Prepared by

Nelson Phillips and Bradley Coates

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### Approved by

Luke Clements (CEnvP-SC)

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### File name

Chatswood Pre-Remediation – SAQPv2.0

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## Executive Summary

Nation Partners was previously engaged by Sydney Metro to prepare a Remediation Action Plan (RAP) (Nation Partners, 2021a) and Remediation Cost Estimate (RCE) (Nation Partners, 2021b) for the property known as the Chatswood Metro site, located at the north-east corner of the Pacific Highway and Mowbray Road, Chatswood (the site). The RAP and RCE were developed following a Data Gap Investigation (DGI) (Nation Partners 2021c), which identified several potentially complete source-pathway-receptor (SPR) linkages in the conceptual site model (CSM). These SPR linkages warrant remediation for the site to be suitable for a potential future low-density residential land use.

The RAP (Nation Partners, 2021a) included a remediation options assessment, which identified that an off-site disposal strategy was the most economical, reliable, and risk averse management measure to address the identified contamination requiring remediation and achieve the Sydney Metro divestment objective of an unrestricted land use from a contaminated soil perspective.

The DGI (Nation Partners, 2021c) also identified several data gaps with respect to the chosen remediation option, which were included in the RAP (Nation Partners, 2021a) as requirements to be addressed prior to the remediation works commencing. In particular, the following is required to be investigated by a pre-remediation investigation:

1. There is the potential for shallow groundwater impacted by per- and poly-fluoroalkyl substances (PFAS) to be present. Investigation of the likelihood for shallow groundwater is required, in addition to an assessment of potential exposure risk to site workers (if present).
2. Additionally, there is uncertainty regarding the groundwater flow direction of deep groundwater, and natural attenuation of heavy metal and hydrocarbon impacts.
3. Waste classification conducted as part of the DGI (Nation Partners 2021c) was preliminary only and did not provide a sufficient sampling density to achieve assurance. Additional in-situ waste classification sampling is required to refine the waste classifications (noting that ex-situ classification will be required by the future remediation contractor prior to off-site disposal).
4. Asbestos containing material (ACM) has previously been reported in the fill soils at the site, however the entire site has not been investigated in a sufficient manner to determine the potential wide-spread presence of ACM or friable asbestos/asbestos fines (FA/AF). An asbestos in soils investigation of the entire site is required to inform this data gap and refine the remediation approach.
5. The footprint of the former energy depot building footprint has not been investigated to date. It is required to be investigated to inform the remediation approach.

Nation Partners has prepared this Sampling Analysis and Quality Plan (SAQP) to detail the current CSM, remaining data gaps with respect to the RAP, and the scope of work to address these data gaps. Upon completion of the fieldworks Nation Partners will prepare a RAP addendum and RCE update to reflect data gaps addressed during the field investigation.

## Acronyms and Abbreviations

ACM	asbestos containing materials
AF/FA	asbestos fines/fibrous asbestos
AFFF	aqueous film forming foam
AHD	Australian Height Datum
BaP	benzo(a)pyrene
BTEX	benzene, toluene, ethylbenzene and xylenes
BYDA	Before You Dig Australia
CoC	chain of custody
CSM	conceptual site model
DGI	Data Gap Investigation
DO	dissolved oxygen
DOO	data quality objective
DTW	depth to water
EIL	ecological investigation limit
ENM	excavated natural material
EPA	Environmental Protection Authority
ESL	ecological screening limit
GDE	groundwater dependant ecosystem
GIL	groundwater investigation level
GME	groundwater monitoring event
GPS	Global Position System
GSW	General Solid Waste
HIL	Health-based Investigation Level
HDPE	High Density Polyethylene
HSEP	Health, Safety and Environment Plan
HSL	Health-based Screening Level
IDE	inflow dependant ecosystem
IL	investigation level
km	kilometre
LCS	laboratory control standard
LOR	limit of reporting
m	metre
mBGL	metres below ground level
µm	micron
MLP	Master Lease Property
MNA	monitored natural attenuation
NAPL	non-aqueous phase liquid



NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
NSW	New South Wales
OCP	organochlorine pesticides
OPP	organophosphorus pesticides
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PFAS	per- and poly-fluoroalkyl substances
PFAS NEMP	PFAS National Environmental Management Plan 2.0
PFHxS	perfluorohexane sulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PID	photoionisation detector
PPE	personal protective equipment
PSV	passive soil vapour
QA	quality assurance
QC	quality control
RAP	remediation action plan
RCE	remediation cost estimate
RPD	relative percent difference
SAQP	sampling, analysis and quality plan
SIL	soil investigation level
SL	screening level
SPR	source-pathway-receptor
SWMS	safe work method statement
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbons
TRH	total recoverable hydrocarbons
TSE	Sydney Metro tunnel and station excavation contractor
USCS	Unified Soil Classification System
UST	underground storage tank
VCH	volatile chlorinated hydrocarbons



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# 1 Introduction

## 1.1 Background

Nation Partners Pty Ltd (Nation Partners) has been engaged by Sydney Metro to prepare a Sampling Analysis and Quality Plan (SAQP) for a Pre-Remediation Investigation at the Chatswood Metro site located at the north-east corner of the Pacific Highway and Mowbray Road, Chatswood, New South Wales (NSW) (the site). The location and boundary of the site are shown on **Figure 1**.

Nation Partners previously completed a Data Gap Investigation (DGI) (Nation Partners, 2021c) to inform remedial works to support Sydney Metro with the divestment of the site. These works culminated with Nation Partners developing a Remediation Action Plan (RAP) (Nation Partners, 2021a) and Remediation Cost Estimate (RCE) (Nation Partners, 2021b) and identified that an off-site disposal strategy was the most economical, reliable, and risk averse management measure to address the identified contamination requiring remediation and achieve the Sydney Metro divestment objective of an unrestricted land use from a contaminated soil perspective.

The Pre-Remediation Investigation report will address data gaps identified in the DGI (Nation Partners, 2021c) related to the chosen remediation option, which were included in the RAP (Nation Partners, 2021a) as requirements to be addressed prior to the remediation works commencing. A RAP addendum and RCE update will subsequently be prepared by Nation Partners to reflect the data gaps addressed in the Pre-Remediation Investigation report.

Sydney Metro have also engaged Dr Lange Jorstad from Geosyntec Consultants Pty Ltd as a NSW Environment Protection Authority (EPA) accredited Site Auditor under the *Contaminated Land Management Act 1997* to undertake a non-statutory site audit for the site. It is understood that a Section B Site Audit Statement stating that the site can be made suitable for the proposed land use, with the implementation of the RAP addendum. It is understood that Dr Jorstad will be involved as a Site Auditor in this Pre-Remediation Investigation project.

This SAQP describes the basis for the site investigation approach, the nature and extent of the investigation works and details the procedures to ensure data quality. Nation Partners' role for the works is to implement the fieldwork component and subsequently prepare a Pre-Remediation Investigation report, RAP addendum, and RCE update.

## 1.2 Objectives

The objectives of the Pre-Remediation Investigation to which this SAQP applies are to:

- Collect data that will inform data gaps remaining from prior investigations and resulting from the proposed remediation works:
  - **Data Gap 1**  
There is the potential for shallow groundwater impacted by per- and poly-fluoroalkyl substances (PFAS) to be present. Investigation of the likelihood for shallow groundwater is required, in addition to an assessment of potential exposure risk to site workers (if present).
  - **Data Gap 2**  
There is uncertainty regarding the groundwater flow direction of deep groundwater, and natural attenuation of heavy metal and hydrocarbon impacts.
  - **Data Gap 3**  
Waste classification conducted as part of the DGI (Nation Partners, 2021c) was preliminary only, and did not provide a sufficient sampling density to achieve assurance. Additional in-situ waste classification sampling is required to refine the waste classifications (noting that ex-situ classification will be required by the future remediation contractor prior to off-site disposal).



– **Data Gap 4**

Asbestos containing material (ACM) has previously been reported in the fill soils at the site, however the entire site has not been investigated in a sufficient manner to determine the potential wide-spread presence of ACM or friable asbestos/asbestos fines (FA/AF). An asbestos in soils investigation of the entire site is required to inform this data gap, and refine the remediation approach.

– **Data Gap 5**

The footprint of the former energy depot building footprint has not been investigated to date. It is required to be investigated to inform the remediation approach.

- Refine the Conceptual Site Model (CSM) for the site; and
- Refine the waste classification of soils to inform the remediation of the site.

## 1.3 Scope of Work

To achieve the objectives stated above, the following scope of works are to be completed by Nation Partners during the Pre-Remediation Investigation:

- Preparation of this SAQP, detailing the sampling and laboratory analyses that will be conducted during the investigation;
- Develop a project execution and probity plan to guide project management during the investigation;
- Liaise with Sydney Metro and LineWide contractors (current site occupier) with respect to access, timing, permits and inductions;
- Prepare a Health, Safety and Environmental Management Plan (HSEP) to address health, safety, and environmental risks associated with the proposed works. HSEP documents are to be submitted to Sydney Metro and LineWide for approval prior to commencement of site works; and
- Conduct sampling works as detailed in this SAQP. The SAQP will be provided to Sydney Metro and the Site Auditor for review and approval prior to commencement of site works;
- Interpret data collected during the field investigation and prepare a Pre-Remediation Investigation report detailing the findings; and
- Preparation of a RAP addendum and RCE update to reflect data gaps addressed during the field investigation.

This SAQP was separated into three investigations comprising the following sampling methodologies, a detailed sampling and analytical schedule is provided in **Section 6.2**:

- Groundwater Investigation
  - Existing shallow groundwater monitoring wells (4) will be purged dry and sampled if observed to recharge sufficiently within a period of 24 hours;
  - Redevelop and sample existing deep groundwater monitoring wells (14);
  - Install pressure transducers in up to six deep monitoring wells to assess temporal changes to groundwater levels;
  - Conduct a second round of sampling to inform the extent of potential biodegradation of contaminants; and
  - Preparation of a factual letter, detailing results of the field investigation.
- Energy Depot Investigation
  - Underground service locating at six locations within the building footprint;
  - Concrete cutting a 0.5 metres (m) by 0.5 m area to allow a bulk fill sample to be obtained for qualitative and quantitative assessment of ACM, AF, and FA;

- Sampling from soil bores advanced through non-destructive drilling (hand auger) to a depth of 1.2 metres below ground level (mBGL) then advancement to a depth of 0.5 m into natural soils or 0.5 m beyond field observations of contamination, or refusal (whichever occurs first); and
- Preparation of a factual letter, detailing results of the field investigation.
- Asbestos in Soils Investigation
  - Underground service locating at 40 locations across the site;
  - Concrete cutting 40 x approximately 0.8 m by 2.0 m areas to allow advancement of test pits to approximately 2 mBGL;
  - Removal of the concrete with an excavator with hammer attachment;
  - Collection of two bulk fill samples per location for qualitative and quantitative assessment of ACM, AF, and FA;
  - Test pit locations will be backfilled with spoil and broken concrete slab, with the surface to be reinstated with road-plates; and
  - Preparation of a factual letter, detailing results of the field investigation.

## 1.4 Legislation, Standards, Guidelines

Guidelines and standards made by the NSW EPA have been adopted in the preparation of this SAQP. These documents are listed on the NSW EPA web site ([www.epa.nsw.gov.au/clm/guidelines.htm](http://www.epa.nsw.gov.au/clm/guidelines.htm)) and, as at May 2023 comprise:

- *Contaminated Land Guidelines: Sampling Design Part 1 – Application* (NSW EPA, 2022a);
- *Contaminated Land Guidelines: Sampling Design Part 2 – Interpretation* (NSW EPA, 2022b);
- *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land* (NSW EPA 2020);
- *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme, 3<sup>rd</sup> edition* (NSW EPA 2017);
- *Contaminated Sites: Guidelines for the assessment and management of groundwater contamination* (NSW EPA 2007); and
- *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (NSW EPA, 2015).

Other relevant standards and guidelines from Australian regulatory authorities and endorsed by the NSW EPA have been considered for this investigation, including:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018);
- *Australian Drinking Water Guidelines* (NHMRC & NRMCC, 2022);
- *Water Quality – Sampling – Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples* (Australian Standard AS/NZS 5667.1:1998);
- *Water Quality – Sampling – Part 11: Guidance on Sampling of Groundwaters* (Australian Standard AS/NZS 5667.11:1998);
- *Water Quality – Sampling – Part 11: Guidance on Sampling of Groundwaters* (International Standard ISO 5667-11:2009);
- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 No. 1* (NEPM, 2013);
- *Guidelines for Managing Risks in Recreational Water* (NHMRC 2008);
- *Guidance on Per and Polyfluoroalkyl substances (PFAS) in Recreational Water* (NHMRC 2019);
- *Waste Classification Guidelines – Part 1: Classifying Waste* (NSW EPA, 2014);
- *Addendum to the Waste Classification Guidelines (2014) – Part 1: Classifying Waste* (NSW EPA, 2016); and
- *PFAS National Environmental Management Plan Version 2.0* (NEMP 2020).

## 2 Site Information

### 2.1 Site Location and Identification

The site location is illustrated in **Figure 1** and described below in **Table 2.2**.

**Table 2.1: Site Identification Details**

Current Site Owner:	Sydney Metro
Address:	<p><u>Central Portion</u> (Former Ausgrid depot) 339 Mowbray Road, Chatswood</p> <p><u>Northwest Portion</u> (Former Caltex service and Master Lease Property [MLP] site) 607 Pacific Highway, Chatswood</p> <p><u>Southwest Portion</u> (Former retail area) 589 Pacific Highway, Chatswood</p> <p>Northeast Portion (Former Total Quality Centre) 339 Mowbray Road, Chatswood (located adjacent to eastern extent of Nelson Street)</p>
Co-ordinates (Map Grid of Australia [MGA] Zone 56):	331540 m East; 6258050 m North (approximate center of the site)
Legal Identification:	<p><u>Central Portion</u> (Former Ausgrid depot) Lot 1 / DP243111; Lot 2 / DP221896; Lot 6 / DP66854; Lot 5 / DP524631; Lot 18 / DP60346; Lot 2 DP537580; Lots 4, 5 &amp; 6 / DP65670</p> <p><u>Northwest Portion</u> (Former Caltex service and MLP site) Lot 1 / DP537580; Lot 1 / DP503447; Lot 2 / DP1223080; Lot 3 / DP961402; Lots 3 &amp; 4 / DP455907</p> <p><u>Southwest Portion</u> (Former retail area) Lot 1 / DP216408; Lot 1 / DP204133; Lot 1 / DP50875; Lot 3 / DP58646; Lot 6 / DP72759</p>
Site Area:	Approximately 18,000 square metres (m <sup>2</sup> ) excluding the Sydney Metro Dive Site
Location Government Area:	Willoughby City Council
Zoning:	<p>SP2 – Infrastructure, majority of site</p> <p>B2 – Business development, western portion</p> <p>R3 – Medium density residential – boundary with Nelson Street</p>

## 2.2 Environmental Setting

### 2.2.1 Topology and Hydrology

The site is relatively flat with an elevation that ranges from approximately 101 m Australian Height Datum (AHD) in the north to 104 m AHD in the south. It exists on a gentle slope extending toward the north to north-east and north-west from a high point in the south. Immediately east of the dive site is the cutting for the rail corridor which is approximately 5-7 m deep.

GHD (2020a) noted that most rainfall across the site is likely to enter the local stormwater system to the north before flowing either east or west. Two likely stormwater discharge points were identified by Douglas Partners (2018) being Scotts Creek, 1.7 kilometres (km) north or Castle Cove, 3.6 km east of the site.

The nearest water body to the site is Swaines Creek which is approximately 1 km west-northwest of the site. Swaines Creek flows west towards the Lane Cove River, approximately 2 km west of the site.

## 2.2.2 Soils and Geology

The site is underlain by Ashfield Shale of the Wianamatta Group from the Triassic period, which is comprised of black to dark grey shale and laminate. Approximately 500 m both east and west of the site is Triassic period Hawkesbury Sandstone, a medium to coarse grained quartz sandstone, which also underlies the Ashfield Shale. Very minor shale and laminate lenses are also present in the surrounding area. Considering the wider geology of the surrounds, the site is located on a ridge capped by Ashfield Shale, with the underlying Hawkesbury Sandstone exposed to the east and west.

A summary of the general soil conditions encountered during the DGI (Nation Partners, 2021c) is summarised **Table 2.2** below.

**Table 2.2: General Soil Conditions**

Depth (m)	Unit/Material	Description
0.0 to 0.2-1.6 <sup>a</sup>	Concrete/asphalt	FILL: Concrete was encountered across the entire site. Asphalt was encountered in SRT-PT017, which is located near the former Bryson Road.
0.2-1.6 to 0.4-4.5 <sup>b</sup>	Fill	FILL: Material generally consisted of road base, dark brown and dark grey gravelly clays and sands, coarse grained. Encountered between concrete slabs across the site.
0.4-4.5 to $\geq$ 4.5	Reworked natural materials <sup>c</sup>	CLAY: Reworked natural clays and clays with sand, ranging from reddish brown to yellowish brown. Generally soft, dry-moist. Sometimes containing gravel.
	Natural	CLAY: Clay, reddish-brown with some grey or red mottling. Stiff to very stiff with trace gravel.
	Natural	CLAY: Grey clay with red mottling. Generally stiff to very stiff, dry with fine-coarse gravel and ironstone, with silt at times.
$\geq$ 11.0	Natural	SHALE: Grey weathered shale

a – 1.6 m of concrete was encountered at PT024, likely associated with a former building footing/foundation, which was anecdotally confirmed by the Sydney Metro Tunnel and Station Excavation (TSE) contractor staff who were present during initial site preparation works for TSE occupation.

b – 4.5 m of concrete was encountered at PT014. Based on field observations and a post-fieldwork review of historical aerial photographs, it is most likely the concrete was associated with a former building footing/foundation.

c – soil material indicated to be site-derived, however has been subject to earthworks.

## 2.2.3 Hydrogeology

GHD (2020a) conducted a review of existing groundwater bores provided in the Lotsearch (2020) report. Sixteen groundwater monitoring bores were owned by Energy Australia (Licence No. 10BL603114) on the site. These have been confirmed as destroyed except for one pair of nested monitoring wells, designated as SRT-MW101D (deep well) and SRT-MW101S (shallow) for the purposes of this investigation. The previous bore numbers for the nested wells are indicated to be MW27A and MW27B, and were installed by Coffey in 2009. Well constructions details for both wells were not available at time of reporting.

Two water-bearing zones were identified in previous investigations by Golder (2009), which was consistent with the findings of the DGI (Nation Partners, 2021c):

- A shallow, perched water-bearing zone which extends approximately 5 mBGL<sup>1</sup> with water levels recorded at approximately 2-4 mBGL. Water in this zone was inferred to be from rainfall recharge that was perched in the low permeability clay profile.

<sup>1</sup> Ground level associated with previous reports is noted to be the level prior to site filling by the TSE contractor

- A deeper water-bearing zone with clay/weathered shale which extends to approximately 7 – 12 mBGL and water levels at approximately 2 mBGL. This deeper water bearing zone was considered to be semi-confined due to the presence of approximately 6.5 m of low permeability clay overlying it.

During the DGI (Nation Partners, 2021c), 16 new groundwater monitoring wells were installed with three shallow wells installed to a depth of 6 mBGL, and 13 deep wells installed to depths of 13.5 mBGL – 17.5 mBGL. Two rounds of sampling were undertaken, referred to as Stage 1 (July 2020) and Stage 2 (October 2020), and the depth to groundwater encountered is summarised in Table 2.3 below.

**Table 2.3: Summary of Groundwater Levels**

Well ID	Easting (m)	Northing (m)	Top of Casing (mAHD)	Stage 1 DTW (mbtoc)	Stage 1 SWL (mAHD)	Stage 2 DTW (mbtoc)	Stage 2 SWL (mAHD)
SRT-MW004	331567.182	6258028.446	103.366	5.594	97.772	9.893	93.473
SRT-MW006	331542.453	6258020.431	103.273	3.220	100.053	3.765	99.508
SRT-MW009	331490.572	6257957.418	104.117	4.145	99.972	4.425	99.692
SRT-MW009S	331490.78	6257958.422	104.235	3.825	100.41	4.472	99.763
SRT-MW011	331494.627	6257989.543	103.455	3.262	100.193	3.915	99.540
SRT-MW011S	331495.274	6257988.864	103.575	3.150	100.425	3.553	100.022
SRT-MW013	331490.607	6258029.951	103.268	3.122	100.146	4.132	99.136
SRT-MW013S	331491.543	6258029.816	103.390	3.101	100.289	3.467	99.923
SRT-MW017	331515.592	6258046.367	103.416	3.373	100.043	4.052	99.364
SRT-MW018	331504.919	6258063.645	103.159	3.555	99.604	4.115	99.044
SRT-MW022	331560.047	6258112.116	102.958	6.034	96.924	6.585	96.373
SRT-MW024	331568.782	6258139.86	103.079	11.900	91.179	7.514	95.565
SRT-MW101D	331560.42	6258026.177	103.333	3.262	100.071	5.600	97.733
SRT-MW101S	331559.67	6258026.723	103.391	3.578	99.813	4.417	98.974
SRT-MW025	331570.938	6258065.481	103.67	-	-	7.473	96.197
SRT-MW026	331484.197	6257986.011	103.492	-	-	3.985	99.507
SRT-MW027	331478.648	6258084.277	103.319	-	-	8.403	94.916
SRT-MW028	331498.8	6258120.8	103.277	-	-	8.510	94.767

Results from Stage 1 indicated that groundwater flow across the site was towards the north-east with SRT-MW024 recording the lowest groundwater level at 91.179 mAHD. The highest groundwater level was recorded at SRT-MW011 at 100.193 mAHD. Results from Stage 2, including the four additional GMMW (SRT-MW025-28) indicated a slight change in groundwater conditions. The groundwater level at SRT-MW024 was approximately 4.4m higher in October 2020 than in July 2020 at 95.565 mAHD. Groundwater levels measured at SRT-MW027 (94.916 mAHD) and SRT-MW028 (94.767 mAHD) were both lower than SRT-MW022, resulting in the inferred groundwater flow for the site shifting towards the north-west.

Groundwater levels at SRT-MW004 and SRT-MW101D were also significantly lower in October 2020 than in July 2020, being approximately 4.3 m and 2.4 m lower, while all other wells were generally only 0.4-0.8 m lower, except for SRT-MW024. SRT-MW004 also recorded the lowest groundwater level for the site at 93.473 mAHD, which is inconsistent with the previous sampling event.

The cause behind varying groundwater conditions was considered be due to several factors:

- Tunnel Construction – For the construction of the Sydney Metro Tunnel, the TSE contractor, in addition to having a cut approximately 21 mBGL, installed a groundwater sump located near SRT-MW024. The groundwater sump was anticipated to have a localised influence on groundwater, evidenced by levels recorded at SRT-MW024 in July. It is noted by JHCPBG (2019) that temporary construction drawdown impacts are estimated to range up to 1-2 m, possible exceeding seasonal groundwater fluctuations.

JHCPBG (2019) estimated that seepage would peak at 35 kilolitres per day (kL/day) at the Chatswood dive site, and would reduce to 29 kL/day one year following construction, reducing the amount of groundwater required to be pumped out. It is likely that groundwater conditions near the dive site are beginning to recover and normalise, as construction of the tunnel by TSE has been completed. This may have contributed to the significantly higher groundwater level at SRT-MW024 in October, while other monitoring wells experienced lower levels.

- Seasonal changes – Rainfall levels prior to the July and October sampling events varied significantly with 11.6 mm and 50.6 mm of rain 7 and 28 days prior to sampling in July, compared to 2.8 mm and 19 mm in October. The reduced levels of rain likely contributed to lower groundwater levels across the site, except for SRT-MW024.
- For both monitoring events, there was a significant head difference between wells SRT-MW101D and SRT-MW004, which are located approximately 8 m apart. SRT-MW101D is a pre-existing well installed by Coffey in 2009, which was re-developed during Stage 1 prior to sampling and gauging. No construction details of SRT-MW101D (or SRT-MW101S) were available at the time of reporting. While the cause of a significant head difference in a small area is not yet fully understood, it could potentially be due to a number of contributing factors including potential differences in well construction and screening intervals; depths of the well, SRT-MW101D recorded depth was 11.2m BGL, whilst SRT-MW004 has a depth of 14.4 m BGL; the age and condition of SRT-MW101D; and potential localised influence from pumping associated with tunnel construction.

## 3 Contamination Information

Previous investigations and detail on historical site uses are summarised in the DGI (Nation Partners, 2021c), and the sampling locations are shown on **Figure 2**.

### 3.1 Contamination Summary

The DGI (Nation Partners, 2021c) was undertaken to address data gaps identified in a previous investigation undertaken by GHD Pty Ltd (GHD), titled *Sydney Metro, Chatswood Metro, Corner of Pacific Highway and Mowbray Road, Chatswood, Contamination Summary Report* (GHD 2020a), and to allow for the refinement of a remediation cost estimate (RCE) titled *TfNSW Sydney Metro Chatswood Dive Site – Budget remediation cost estimate – Version 1* (GHD 2020b).

This investigation concluded the following contamination conditions and source-pathway-receptor (SPR) linkages:

- Exceedances of the adopted human health investigation levels for benzo(a)pyrene (BaP), benzene, lead, polycyclic aromatic hydrocarbons (PAHs), and total recoverable hydrocarbons (TRH) were recorded in soil during the investigation. Additionally, exceedances of the adopted ecological investigation levels were reported for BaP and zinc. Most exceedances were reported within fill materials and mainly within the western portion of the site, with only three exceedances recorded in natural soils. Soil sampling undertaken during this investigation broadly characterised the surface fill imported by the Sydney Metro TSE contractor and provided an understanding of the current underlying lithology across the site. Borehole logs provided in this report presented a clear interface between fill and natural soil across the site.
- Exceedances of the adopted human health investigation levels for arsenic, BaP, benzene, lead and PFAS were reported in groundwater. Exceedances of the adopted ecological investigation levels also reported for copper, lead, mercury, nickel, PFAS, and zinc. Groundwater in the south-west and south-east portions of the site was typically impacted by PFAS, whilst benzene impacted groundwater was encountered near the north-eastern boundary of the site. Heavy metals concentrations were generally consistent across the site. The groundwater monitoring well network installed as part of this investigation provided adequate spatial coverage across the site to assess groundwater quality and hydrogeological conditions in down-, up-, and cross-gradient locations.
- Groundwater levels and flow direction were inferred during both targeted groundwater monitoring events. Results from Stage 1 indicated that groundwater flow across the site was typically towards the north-east. In contrast, groundwater gauging conducted during Stage 2 indicated that groundwater flow was generally towards the north-west. A number of potential factors behind the change in hydrogeological conditions were identified in this report, including seasonal changes with significantly higher rainfall levels experienced prior to Stage 1 when compared to Stage 2, and the impact of the tunnel construction, specifically the recovery of groundwater conditions following the completion of tunnel construction/boring. Additional groundwater data was required to further assess on-site hydrogeological conditions.
- Geochemical parameters within groundwater were assessed to provide information on the status of natural attenuation, and whether it is occurring on-site. Based on the results, natural attenuation through biodegradation may be occurring within the shale aquifer on-site. However, further data through monitoring groundwater conditions over time was required to determine the extent of potential biodegradation.
- Passive Soil Vapour (PSV) sampling was conducted in a grid-like pattern, surrounding the former vapour monitoring location 'V01' where elevated levels of tetrachloroethene (PCE) had been historically recorded in soil vapour. No exceedances of investigation levels for PCE, or any other volatile chlorinated hydrocarbons (VCH), were reported in PSV samplers, or other media sampled throughout this investigation. VCH was considered unlikely to have an impact on the current and proposed land use for the site.

- PSV sampling was conducted in a grid-like pattern, surrounding Mowbray House to assess the suitability of ongoing and future occupation of the heritage-listed building. No exceedances of the adopted investigation levels for volatile soil vapours were reported, indicating that this source-pathway-receptor (SPR) linkage was incomplete, and Mowbray House was suitable as is for ongoing and future occupation.
- PFAS were reported in groundwater at concentrations above the adopted human health and ecological investigation levels in 11 monitoring wells in both Stage 1 and Stage 2. Based on the concentrations of PFAS observed, and the inferred groundwater flow direction for the site, the potential for PFAS to be migrating onto the site via groundwater from an off-site source cannot be discounted. However, historically, 'froth' was observed during the removal of underground storage tanks (USTs) 1, 2 and 3, west of Mowbray House. Further, while during the development of the well which reported the highest concentration (SRT-MW011), evidence of foam was observed. Both are potential indicators of historical use of PFAS containing aqueous film forming foam (AFFF) for firefighting purposes, though further data was required to identify specific PFAS sources.
- Potential pathways for the migration of and ingress of groundwater and vapour from surrounding in-situ materials into potential future basements were assessed as part of this investigation. Concentrations of hydrocarbons and benzene, toluene, ethylbenzene and xylenes (BTEX) were either below the adopted investigation levels for vapour intrusion; or where exceedances were reported for benzene in soil, were located and delineated such that impacted material would be excavated for the construction of the future basements. Hydrocarbons and BTEX were not considered to pose a risk to users of potential future basements, though the presence of PFAS in groundwater did pose a potential risk to human and ecological receptors during construction and ongoing operation of future basements, and was required to be addressed within the RAP addendum.
- A preliminary in-situ waste classification was completed for the site indicating that fill across the site was largely preliminary classified as general solid waste (GSW), with underlying natural soil preliminary classified as excavated natural material (ENM). Exceptions to this for fill included historical asbestos burial pits, a potential asbestos slab, and potential widespread asbestos in fill across the site which were preliminarily classified as GSW-asbestos. There were also isolated exceedances of the ENM absolute maximum observed in natural soils, which are preliminarily classified as GSW. Further waste classification sampling during implementation of the RAP or redevelopment of the site was required to confirm the preliminary classifications.
- The CSM for the site was refined based on the findings of this investigation to indicate SPR linkages which were now considered to be complete, potentially complete, or currently incomplete based on the potential redevelopment of the site. Several potentially complete SPR linkages in regard to the preferred redevelopment scheme needed to be addressed by either further investigation or within the RAP addendum. These included:
  - Dermal contact, ingestion, or dust inhalation of fill material impacted by heavy metals and hydrocarbons currently covered by hardstand;
  - Use or consumption of PFAS impacted groundwater if abstracted and encountered by human and ecological receptors during the construction and ongoing operation of future basements. Additional data was required to understand the source of PFAS found within groundwater; and
  - Inhalation of asbestos fibres from known buried asbestos impacted material and potential asbestos impacted fill currently covered by hardstand.



## 4 Conceptual Site Model & Data Gaps

### 4.1 Conceptual Site Model

The following CSM was presented in the DGI (Nation Partners, 2021c) and outlines the SPR linkages that have been assessed to be complete, potentially complete, or currently incomplete. The data collected through the pre-remediation investigation will be used to refine the CSM.

**Table 4.1: CSM**

Source	Impacted Media	Pathways	Receptors	Assessment/Rationale
Former energy depot (central portion) including transformer workshop area, USTs, vehicle workshop, wash bay and oil storage tanks	Soil impacted by heavy metals, TRH and BTEX	Dermal contact / ingestion of soils	Site workers, contractors, visitors Future site users	No exceedances of the health investigation and screening levels were observed in this area during the DGI. Exceedances of lead and PAH were reported in SRT-PT017, though are attributed to the former Bryson Road. Site constraints meant that soils underneath or near the current building footprint in this area could not be assessed nor has assessment occurred historically. Historical exceedances of lead and PAH have been observed near UST 5 and 6. This SPR linkage was considered potentially complete. Soil sampling in the footprint of the former energy depot buildings is required to address this data gap.
			Ecological receptors that inhabit or forage in public open space parkland areas proposed for the site	One zinc exceedance of the ecological screening limit (ESL) was observed within the footprint of this area during the DGI, and exceedances of total petroleum hydrocarbons (TPH) have been observed historically in the vicinity of former pipework associated with USTs 5 and 6 (VA1, VA2 and VA3). This SPR linkage was considered to be currently incomplete due to the lack of ecological receptors on the site. There is the potential for the SPR linkage to be potentially complete in the future redevelopment. However, exceedances of the adopted investigation levels will likely be excavated or future public open space areas will utilise imported soil. This is required to be addressed during future remediation.
		Dust and fibre inhalation	Site workers, contractors, visitors	Impacted fill and buried asbestos impacted material poses a potential risk to site workers, contractors and visitors if materials are exposed. Historic investigations indicate the presence of chrysotile asbestos within the footprint of the former energy depot, though currently the site is covered by hardstand. This SPR linkage is considered to be currently incomplete. Soil sampling for asbestos across the site is required to address this data gap.

Source	Impacted Media	Pathways	Receptors	Assessment/Rationale
	Groundwater impacted by heavy metals, BTEX and PFAS	Groundwater use or consumption	Nearby groundwater bores, streams / rivers and groundwater dependant ecosystems (GDEs)	PFAS exceedances, including exceedances of the PFAS NEMP Freshwater 95% and Drinking Water criteria were observed in this area. Froth observed during the removal of USTs 1, 2 and 3 could potentially be linked to the presence PFAS within groundwater though no PFAS was detected above the limit of reporting (LOR) in soils during the investigation. Should PFAS impacted groundwater be abstracted from this area there is the potential for a complete pathway to exist.
Former Caltex service station and MLP site including former bulk fuel storage and USTs	Soil impacted by heavy metals, TRH and BTEX	Dermal contact / ingestion of soil	Site workers, contractors, visitors Future site users	Exceedances of human health investigation and screening levels were observed in three soil samples including exceedances of TRH and lead as part of the DGI, with additional lead, TRH and BTEX exceedances observed historically. Elevated concentrations of TRH were also observed in other soil samples in the area. This SPR linkage was considered to be currently incomplete, as contaminated soils are currently located under hardstand. This SPR linkage could be potentially complete, during the redevelopment of the site, and will need to be addressed during future remediation.
			Ecological receptors that inhabit or forage in public open space parkland areas proposed for the site	Exceedances of the ESL for TPH have been observed in this area in a number of occasions in historical investigations, and two exceedances were observed as part of the DGI (SRT-PT016). The majority of exceedances were reported at depths of 2 mBGL or deeper (with the exception of one sample) at the time of each respective investigation. This SPR linkage is considered potentially complete and should be reassessed based on the design of any proposed public open space areas.
		Dust and fibre inhalation	Site workers, contractors, visitors	Impacted fill and buried asbestos impacted material (including asbestos pits) poses a potential risk to persons working on the redevelopment of the site if disturbed. This SPR linkage is considered to be currently incomplete, though will require consideration during future remediation.
	Groundwater impacted by heavy metals, BTEX and PFAS	Groundwater use or consumption	Nearby groundwater bores, streams / rivers and GDEs	PFAS was reported in concentrations above the drinking water and ecological criterion in groundwater in SRT-MW018 and should groundwater be abstracted from this area there is the potential for a complete pathway to exist. The former Caltex service station and MLP site is considered to be an unlikely source of PFAS observed across the site, based on concentrations of PFAS observed and the inferred groundwater flow across the site.
Former Total Quality Centre where waste solvents, reagents and oils were stored	Soil	Dust and fibre inhalation	Site workers, contractors, visitors	Impacted fill and buried asbestos impacted material (including potential asbestos slab) poses a potential risk to persons working on the redevelopment of the site. This SPR linkage is considered to be currently incomplete, though will require consideration during future remediation.
	Groundwater impacted by heavy metals, BTEX and PFAS	Groundwater use or consumption	Nearby groundwater bores, streams / rivers and GDEs	Exceedances of the adopted investigation levels for heavy metals and PFAS were observed in GWMWs located near the area where the Former Total Quality Centre was located, though typically lower than the remainder of the site. PFAS was reported in concentrations above the drinking water and ecological criterion in groundwater in SRT-MW022 and SRT-MW024, and should groundwater be abstracted from this area there is the potential for a complete pathway to exist.

Source	Impacted Media	Pathways	Receptors	Assessment/Rationale
	Air	Inhalation of soil and groundwater derived vapours in indoor air	Site workers, contractors, visitors Future site users	The exceedance of the health screening level for benzene observed in SRT-PT020 could potentially be linked to historical contamination associated with the Former Total Quality Centre. No other exceedances including historical have been observed. This SPR linkage was considered to be currently incomplete, as the site is currently covered by hardstand. This will be required to be addressed during future remediation.
Former Retail Area	Soils impacted by heavy metals	Dermal contact / ingestion of soil	Site workers, contractors, visitors Future site users	Exceedances of the health investigation levels were observed in two soil samples for lead within fill material in this area during the DGI. This SPR linkage was considered to be currently incomplete, as contaminated soils are currently located under hardstand. This SPR linkage could be potentially complete, during the redevelopment of the site, and will need to be addressed during future remediation.
	Groundwater impacted by PAH and PFAS	Groundwater use or consumption	Nearby groundwater bores, streams / rivers and GDEs	PFAS was detected in concentrations above the drinking water and ecological freshwater criteria in numerous groundwater wells, with the highest concentrations observed in the up-gradient south-western portion of site. PFAS is likely from an on-site source, though this is yet to be confirmed. BaP was detected above the drinking water criterion in SRT-MW009S during Stage 1 of the DGI only. This was the only detection above LOR for BaP across the site, and was potentially due to leaching from BaP impacted fill within the water column. Should impacted groundwater be abstracted, including for any potential future basement scenario, there is a potentially complete pathway which exists.
TSE and historically imported fill from unknown sources and unknown contamination within areas not assessed	Soil impacted by TRH, BTEX, PAH and asbestos or other contaminants	Dermal contact / ingestion of soil	Site workers, contractors, visitors. Future site users	This SPR linkage was considered to be currently incomplete, though during the redevelopment of the site, the removal of hardstand could expose previously undetected contaminated fill. This potential exposure pathway and will need to be addressed during future remediation.
		Dust inhalation	Site workers, contractors, visitors. Future site users	Impacted fill material poses a potential risk to persons working on the redevelopment of the site. This SPR linkage was considered to be currently incomplete, though will require consideration during future remediation.
		Inhalation of asbestos fibres	Site workers, contractors, visitors Future site users	No asbestos was detected during the DGI, however as soil was sampled and assessed via boreholes, only a small proportion of the site was assessed. Large amounts of asbestos have previously been discovered in fill material on the site during the remediation of the former Caltex service station. Currently any potential asbestos impacted fill is covered by hardstand. Therefore, this SPR linkage was considered to be currently incomplete, though will need to be addressed through further assessment.



## 4.2 Data Gaps

The DGI (Nation Partners, 2021c) identified several data gaps with respect to the chosen remediation option, which were included in the RAP (Nation Partners, 2021a) as requirements to be addressed prior to the remediation works commencing. The following data gaps are to be investigated by this pre-remediation investigation:

1. There is the potential for shallow groundwater impacted by PFAS to be present. Investigation of the likelihood for shallow groundwater is required, in addition to an assessment of potential exposure risk to site workers (if present).
2. Additionally, there is uncertainty regarding the groundwater flow direction of deep groundwater, and natural attenuation of heavy metal and hydrocarbon impacts.
3. Waste classification conducted as part of the DGI (Nation Partners, 2021c) was preliminary only, and did not provide a sufficient sampling density to achieve assurance. Additional in-situ waste classification sampling is required to refine the waste classifications (noting that ex-situ classification will be required by the future remediation contractor prior to off-site disposal).
4. ACM has previously been reported in the fill soils at the site, however the entire site has not been investigated in a sufficient manner to determine the potential wide-spread presence of ACM or FA/AF. An asbestos in soils investigation of the entire site is required to inform this data gap, and refine the remediation approach.
5. The footprint of the former energy depot building footprint has not been investigated to date. It will be investigated during this investigation to inform the remediation approach.

## 5 Data Quality Objectives

This SAQP was designed using the Data Quality Objective (DQO) process provided by the US EPA (2000, 2006) and endorsed in the NEPM (2013).

The DQO process is a seven-step planning approach used to establish performance criteria which can be used as the basis for ensuring that data is of sufficient quality and quantity to support the goals of a study. To support estimation, the DQO process develops an analytical approach and data collection strategy that is effective and efficient. The DQOs have been outlined below:

### Step 1. Define the problem

This step defines and describes the problem, identifies the planning team, develops the CSM and identifies the data needed, resources, restraints and deadlines of the project.

Objective:	Gather sufficient data to: <ul style="list-style-type: none"> <li>• Address (to the extent possible) data gaps identified in Section 4.2;</li> <li>• Determine whether contamination at the site, could present risks to Sydney Metro as the site landowner, and/or to potential human and environmental receptors under the proposed used of the site;</li> <li>• Refine the CSM for the site;</li> <li>• Refine the waste classification for soils to potentially be excavated during development; and</li> <li>• To refine RAP and RCE to address data gaps.</li> </ul>
Contamination Issue:	Historical land uses at the site (including underground fuel storage and commercial/industrial operations) and the presence of residual contaminants in soil and groundwater.  Based on a review of historical data, previous investigations provided by Sydney Metro and previous investigations conducted by Nation Partners, possible sources of contamination are summarised in Section 3 of this report.
Project Driver:	Nation Partners were engaged by Sydney Metro to plan and report on the investigation, characterising contamination conditions and providing remediation advice to support the future divestment of the land at the site. This Pre-Remediation investigation is aimed to address data gaps identified within the DGI (Nation Partners, 2021c) with respect to potential remediation options.
Project Team:	Sydney Metro: Site Owner LineWide: Site Occupier Nation Partners: Reporting Consultant Dr Lange Jorstad (Geosyntec): Site Auditor
CSM:	The CSM is included in Section 4.1 of this report.
Resources and Project Timeframes:	The project resources/personnel have been listed above. The fieldworks investigation is due to be completed in Q3-Q4 of 2023, acknowledging the potential for delays caused by uncontrollable events. The major project deliverables (Chatswood Pre-Remediation Investigation Report, RAP addendum and RCE update) are to be delivered by Nation Partners and draft reports are due Q3/Q4 2023.
Stakeholder and Concerns:	Community concerns are expected to be minimal as works will be completed on an operational major construction site. Nation Partners is responsible for engagement with Sydney Metro and LineWide to facilitate site access.
Regulatory Authorities & Local Government:	The site is currently subject to a Site Audit by a NSW EPA accredited site auditor. This SAQP and its deliverable, the Pre-Remediation Investigation report, are subject to review by the NSW EPA accredited site auditor to provide a site audit statement.

### Step 2. Identify the Decision

This step identifies the key questions and objectives of the study, alternative actions or outcomes that may result based on the outcomes.

Media and contaminants of concern	<p>The output of the investigation must be suitable to answer the following questions with regards to the media of concern:</p> <ul style="list-style-type: none"> <li>• What contamination is likely present on the site?</li> <li>• What media are potentially contaminated that could represent a risk to human or environmental receptors, to the tenant or landowner, site users, or to Sydney Metro?</li> <li>• What risks, if any, does the contamination represent to human health or the environment in the context of the proposed landuse?</li> <li>• What is the waste classification of soil that may require excavation under proposed development schemes?</li> <li>• If contamination is present on-site, what additional action is required to further assess or manage the associated risks?</li> </ul>
Guidelines	The relevant guidelines have been described in Section 1.4 and environmental and human health criteria have been outlined in Section 7.1 and Section 7.2.

### Step 3. Identify Information Inputs

This step is used to determine the types and sources of information needed to produce the desired estimates, specify performance or acceptance criteria, and determine the availability of appropriate sampling and analyses methods.

Site Condition	<p>Land use history and historical aerials (refer DGI (Nation Partners, 2021c)).</p> <p>Previous environmental assessments and investigation data for the site (refer DGI (Nation Partners, 2021c)).</p> <p>Use of field investigation techniques to identify previously undocumented areas of contamination (e.g. detailed site walkovers and inspections, soil and groundwater sampling).</p> <p>Visual observations of waste material, condition of soils and groundwater.</p> <p>Screening with a photoionisation detector (PID) to assess the potential presence of volatile contaminants.</p> <p>Visual observations of local flora and evidence of stress.</p>
Target Media	Observations, descriptions, photographs, logging and sample data to describe the type, extent, volume, distribution, and speciation of contaminated soil and groundwater present on the site.
Data Gaps	The data gaps to be addressed by this investigation are identified in Section 4.2
Investigation criteria:	<p>The soil quality criteria have been outlined in Section 7.1.</p> <p>The groundwater quality criteria have been outlined in Section 7.2.</p>
Sampling and analysis methods:	Appropriate sampling and analysis methods have been identified for the site investigation and are described in Section 6.3.

### Step 4. Define the Boundaries of the Study

This step identifies the spatial and temporal features necessary for accurate estimation, the practical constraints, and the scale of estimation.

Spatial Limit:	The spatial boundary of the site is shown in Figure 1.
Investigation Limit:	The limit of the investigation extent is the depth of sampling locations described in Section 6.2.
Constraints:	<p>Intrusive site investigation works are targeted and of necessity limited by site access restrictions associated with the occupation of the site by the LineWide contractor and the active construction status. The timing and location of investigation activities have been planned to align with the timing and spatial layout of construction activities currently occurring on site.</p> <p>Additional constraints within the study boundaries which require consideration include:</p> <ul style="list-style-type: none"> <li>• Access and heritage restrictions associated with Mowbray House and archaeological sensitive areas related to the structural remains of The School of Arts and Penance;</li> <li>• Presence of underground utilities and services;</li> <li>• Presence of underground obstructions (e.g. buried concrete slabs); and</li> <li>• Areas frequently accessed by construction traffic to minimise impact on ongoing construction work.</li> </ul>
Receptors of Concern:	<p>Potential receptors that need to be considered by the study include:</p> <ul style="list-style-type: none"> <li>• Current and future site occupants/users (including potential future residents and school children);</li> </ul>

- Construction workers;
- Adjacent landowners;
- Flora and fauna on the site and on neighbouring sites;
- Local waterways (**Scott's Creek and Castle Cove**);
- Nearby GDEs and Inflow Dependant Ecosystem (IDE);
- Offsite facilities receiving excavated soil; and
- Groundwater resources.

### Step 5. Develop the Analytic Approach

A decision rule based on both qualitative and quantitative information describing the condition of the site with measurable evaluation criteria.

Decision Rules	<p>The decision rules have been developed based on the underlying project drivers and the corresponding objectives of the site investigation program.</p> <p>The decisions required include:</p> <ul style="list-style-type: none"> <li>• Whether contamination exists in soil or groundwater at the site that could present a risk to human or environmental receptors, or to Sydney Metro as the landowner;</li> <li>• Whether contamination exists in soil or groundwater at the site that could adversely impact the proposed development and/or future land use; and</li> <li>• If contamination is encountered through the characterisation process, what further assessment of management action may be required and what impact may this have on the proposed development and use of the site.</li> </ul> <p>The site will be considered to not pose a risk if analytical results, considered in the context of the site observations and field screening protocols, for the media sampled and analysed are less than the adopted site criteria presented in Section 7. Where exceedances are identified, these will be assessed in the context of the CSM and the current and proposed land use to assess the likelihood of an unacceptable risk.</p> <p>Where a potentially unacceptable risk is identified, feasible remediation and/or management options will need to be considered to address the risk and meet the project objective.</p> <p>If data gaps remain following the investigation that are considered to significant impact the ability to answer the study questions, then further investigation may be required.</p>
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### Step 6. Specify Performance or Acceptance Criteria

This step aims to specify the performance or acceptance criteria that data will need to achieve in order to minimise the possibility of making erroneous decisions or failing to keep uncertainty within acceptable limits and specify acceptable limits on estimated uncertainty.

Documentation and Data Completeness:	<ul style="list-style-type: none"> <li>• Appropriate sampling locations and media are selected that target data gaps identified in Section 4.2 and as such are of environmental / contamination concern.</li> <li>• Sampling locations are adequately documented.</li> <li>• Completion of field records chain of custody forms, lab test certificates from National Association of Testing Authorities (NATA) registered laboratories.</li> <li>• Samples analysed for appropriate contaminants of concern.</li> </ul>
Data Comparability:	<ul style="list-style-type: none"> <li>• Use of a NATA certified laboratory using NEPM procedures.</li> <li>• Use of a NATA certified check laboratory.</li> <li>• Use of appropriate sampling, storage and transportation of samples.</li> </ul>
Data Representativeness:	<ul style="list-style-type: none"> <li>• Collection of representative samples from each sampling location.</li> <li>• Collection of representative samples from targeted locations and ensuring that targeted sampling is considered in the correct context (i.e. representative of the area of concern and not necessarily of the broader site).</li> <li>• Use of appropriate techniques for the sampling, storage and transportation of samples.</li> </ul>



Precision for Sampling and Analysis:	<ul style="list-style-type: none"> <li>• Collection of Quality Assurance (QA) and Quality Control (QC) samples at appropriate rates in accordance with relevant guidance.</li> <li>• Achieve laboratory QC criteria.</li> <li>• Matrix and surrogates return acceptable results.</li> <li>• Laboratory duplicates are within acceptable ranges.</li> <li>• Blind field duplicates are within acceptable ranges.</li> <li>• Laboratory LOR or practical quantification limits (PQLs) are within acceptable ranges.</li> </ul>
Accuracy for Sampling and Analysis:	<ul style="list-style-type: none"> <li>• Use of appropriately trained, experienced and qualified field consultants.</li> <li>• Lab QA and QC results within acceptable ranges.</li> <li>• Achieve lab QC criteria.</li> </ul>

### Step 7. Develop the Detailed Plan for Obtaining Data

This step combines all the information and outputs to design a sampling and analysis plan that will yield data that will best achieve the performance or acceptance criteria and identify constraints that will impact the sampling and analysis design. The sampling and analysis plan has been described in **Sections 6 and 7**.



## 6 Investigation Methodology

To address the identified data gaps, three phases of investigation are proposed:

### Groundwater Investigation

The groundwater residual data gaps from the DGI (Nation Partners, 2021c) to be investigated are: (1) the potential for shallow groundwater to be present in significant quantities; and (2) deep groundwater flow directions and levels, groundwater contamination, and the extent of natural attenuation.

To address Data Gap 1, it was previously demonstrated that PFAS concentrations are below the recreational criteria, which presents the most likely exposure scenario for remediation site workers. As such, a multiple lines of evidence approach is recommended to close the data gap:

- Existing shallow groundwater wells (4) are to be purged dry with recovery monitored over a period of at 24 hours.
- If it is identified that the shallow wells do not recharge, it can be reasonably assumed that the shallow groundwater is intermittent and unlikely to be present in significant quantities.
- If the wells are observed to recharge within 24 hours with sufficient volume to sample, sampling and analysis for PFAS with current nationally endorsed criteria (perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), and perfluorohexane sulfonate (PFHxS)) will be undertaken to determine if concentrations remain below the recreational criteria.
- Pressure transducers will be installed in the four shallow groundwater wells for a period of at least four weeks to assess for temporal changes to shallow groundwater levels.
- Pending the results of the sampling (if undertaken), PFAS specific controls for managing accumulated groundwater in shallow excavations may need to be developed and implemented by the remediation contractor.

To address Data Gap 2, it is recommended that additional groundwater monitoring events over time be undertaken to better assess pathways and potential impacts on receptors. In particular, the following scope of works is proposed:

- Existing deep groundwater wells (14) across the site are to be redeveloped due to the time elapsed since they were last sampled.
- One week following redevelopment, each of the groundwater wells will be sampled.
- Pressure transducers will be installed in up to six deep monitoring wells for a period of at least four weeks to assess for temporal changes to groundwater levels and provide greater confidence in groundwater flow direction.
- A second round of sampling will be undertaken following collection of the pressure transducers, including natural attenuation parameters to inform the extent of potential biodegradation of contaminants. The analytical suite will be identical for the first and second deep groundwater well sampling events.

### Energy Depot Investigation

The residual data gaps from the DGI to be investigated under this phase is (5) the footprint of the former energy depot not having been previously investigated. The investigation will also provide data for (4) the potential for fill across the site to be impacted by asbestos, and (3) the preliminary nature of the waste classification.

To address Data Gap 5, and partially address Data Gaps 3 and 4, it was recommended that test pits or trenches are excavated so that potential buried asbestos can be more readily identified. Additionally, that an

appropriate sampling density with reference to WA DoH (2021)<sup>2</sup>, NSW EPA (2022)<sup>3</sup>, and NEPM (2013) be undertaken, noted to be systematic grid-based sampling at six locations across the approximately 1,000 m<sup>2</sup> footprint.

### Asbestos in Soils Investigation

The residual data gaps from the DGI (Nation Partners, 2021c) to be investigated under this phase are: (4) the potential for fill across the site to be impacted by asbestos; and (3) the preliminary nature of the waste classification.

To address Data Gaps 3 and 4, it is recommended that test pits or trenches are excavated so that potential buried asbestos can be more readily identified. Additionally, that an appropriate sampling density with reference to WA DoH (2022), NSW EPA (2022), and NEPM (2013) be undertaken, noted to be systematic grid-based sampling at 50 locations across the approximately 16,000 m<sup>2</sup> footprint. Whilst the RAP calls for 50 locations to meet the WA DoH (2022) sampling density (double the one location per 25 m grid square density), due to the current use of the site for laydown activities and temporary storage, and extent of the known asbestos burial pit, up to 40 locations are indicatively accessible whilst assessing the site using a systematic grid-based approach.

## 6.1 Buried Services

Prior to commencement of intrusive works Nation Partners will conduct a Before-You-Dig-Australia (BYDA) search and will consult with Sydney Metro regarding the location of buried services (if required). These services include, but are not limited to:

- High voltage power lines;
- Telstra services;
- High pressure gas;
- Optic fibre; and
- Wastewater services.

A suitably qualified service locator will complete a service clearance of each sampling location prior to sampling. Sample locations may be relocated to avoid services.

In addition to consulting BYDA plans and site personnel and engaging a suitably qualified service locator, Nation Partners will implement the following controls to mitigate risks of striking underground services:

- The services located in the vicinity of locations will be marked out on the ground;
- An area with a 5 m radius will be cleared around each location; and
- Where necessary, excavation of the upper 1 m will be performed manually.

## 6.2 Sampling Locations and Laboratory Analytical Schedule

The proposed methods, locations and rationale for sampling methods are described in **Table 6.1**, groundwater monitoring well locations are shown on **Figure 3**, and soil sampling locations are shown on **Figure 4**.

<sup>2</sup> Government of Western Australia, Department of Health, 2021, Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia.

<sup>3</sup> NSW EPA, 2022, Contaminated Land Guidelines, Sampling Design Part 1 – Application.

**Table 6.1: Summary of Sampling Approach and Rationale**

Sample Method	Number of Sample Locations	Analytical Suite	Number of Primary Samples	Rationale
<b>Groundwater Investigation</b>				
Low-flow minimum drawdown	4 x Shallow	PFOS, PFOA, PFHxS	4	To address data gap 1, determining the potential for shallow groundwater to be present in significant quantities. If shallow groundwater is identified to be present, determining if PFAS concentrations remain below the recreational criteria.
Low-flow minimum drawdown	14 x Deep locations	PFOS, PFOA, PFHxS MNA Suite <sup>a</sup> Heavy Metals <sup>b</sup> BTEX	14 per round, with two rounds	To address data gap 2, resolving uncertainty regarding the groundwater flow direction of deep groundwater, and natural attenuation of heavy metal and hydrocarbon impacts Analytical suite identical for both sampling rounds
Pressure Transducers	4 x Shallow locations 6 x Deep locations	N/A	N/A	To aid in addressing both data gaps 1 and 2, assessing temporal changes in groundwater levels for both shallow and deep groundwater wells.
<b>Energy Depot Investigation</b>				
Bulk Sampling by Shovel	6	ACM and AF/FA	6	To partially address data gap 3, refining the waste classification of the soil. To partially address data gap 4, determining the potential for wide-spread presence of ACM of FA/AF. To address data gap 5, investigating the footprint of the former energy depot building footprint.
Mini Drill Rig	6	TRH, BTEX, PAH, Heavy Metals VCH, PCBs, PFAS <sup>c</sup>	6 12	To address data gap 3, refining the waste classification of the soil. To address data gap 5, investigating the footprint of the former energy depot building footprint.
<b>Asbestos in Soils Investigation</b>				
Testpit	40	ACM and AF/FA Waste Classification <sup>c</sup> Toxicity Characteristic Leaching Procedure (TCLP) (PAH and 3 Metals)	80 20 4	To address data gap 3, refining the waste classification of the soil. To address data gap 4, determining the potential for wide-spread presence of ACM of FA/AF.

a – Monitored Natural Attenuation (MNA) sulfate, nitrate, methane, ferrous iron

b – arsenic, cadmium, total chromium, copper, nickel, lead, zinc, and mercury

c - TRH, PAH, BTEX, organochlorine pesticides (OCP), organophosphorus pesticides (OPP), phenols, phthalates, acid herbicides, 2-4-DNT, nitrobenzene, VCH, metals (arsenic, beryllium, cadmium, lead, mercury, molybdenum, nickel, and selenium), hexavalent chromium, total cyanide, free cyanide, and total fluoride

Field quality assurance and quality control samples will be collected during the investigations in general accordance with NEPM (2013), as summarised in **Table 6.2**.

**Table 6.2: Provisional Quality Assurance and Quality Control Scope**

QAQC Sample	Groundwater	Energy Depot	Asbestos in Soils
Inter- and intra-laboratory duplicate	One pair per groundwater monitoring event (GME)	One for the comprehensive suite	One pair per 20 primary samples
Rinsate	One per GME for heavy metals and PFAS from the Interface Probe	One per day for heavy metals	One per day for heavy metals
Trip spike and blank	One per GME, including a PFAS field blank	One – assumes one batch of samples	Three – assumes three batches of samples

## 6.3 Fieldwork Procedures

### 6.3.1 Groundwater Well Redevelopment

Groundwater wells are to be redeveloped as detailed below:

- Depth to groundwater and presence of any non-aqueous phase liquid (NAPL) initially recorded using an interface probe;
- The wells will be purged dry using a stainless-steel bailer or high density polyethylene (HDPE) foot-valve with HDPE tubing), where recharging is observed, further purging of a minimum three well volumes will be conducted. All purged water will be collected in a container;
- Purged water will be assessed for any visual and olfactory signs of contamination and observations will be recorded;
- Where applicable, pressure transducers will be installed inside the wells to monitor and assess temporal changes to groundwater levels; and
- Groundwater well redevelopment sheets will be prepared for each well.

### 6.3.2 Groundwater Sampling Procedures

Low-flow minimum drawdown sampling is proposed for the collection of groundwater samples from across the site. HDPE tubing will be used for the low-flow setup for all groundwater sampling. Prior to sampling, the depth to water (DTW) and the potential presence of NAPL measurements will be recorded using an interface probe at each monitoring well. The DTW measurements will be taken in a single effort before sampling so that the measurements are as reasonably representative of the sampling timeframe.

During sampling a calibrated water quality meter will be used to monitor physical and chemical water quality parameters including pH, redox potential, electrical conductivity, dissolved oxygen (DO), and temperature. During purging prior to sampling, these water quality parameters will be used to determine whether groundwater being extracted from the well is representative of the surrounding aquifer, with samples collected following stabilisation of these parameters (generally  $\pm 10\%$ ).

Groundwater samples will be collected using dedicated sampling equipment to prevent cross contamination. Samples will be collected in laboratory supplied sample bottles using disposable nitrile gloves. Samples collected for metals analysis will be field-filtered using an in-line 0.45 micron ( $\mu\text{m}$ ) filter between the pump and the sampling bottle.

All sample bottles will be stored under ice in an esky for transport to the analytical laboratory. Samples will be delivered to the analytical laboratory using standard Chain of Custody (CoC) documentation.

### 6.3.3 PFAS Specific Sampling Requirements

PFAS-specific sampling protocols in accordance with the PFAS NEMP (2020) will be utilised to minimise cross-contamination or false-positives with respect to PFAS. These protocols include:

- Using PFAS-free sampling consumables and avoiding the use of teflon coated materials (this applies to such items as tubing, water filters, and zip-lock bags).
- The use of PFAS-free drilling fluids and lubricants by the drilling or excavator contractor.
- The use of PFAS-free monitoring equipment (photoionisation detector, interface probe, and water quality meter).
- The use of standard paper, pens and pencils for notes and labelling (no sharpies).
- Avoid wearing new clothing, footwear, PPE and stain / water resistant treated fabrics.
- Where possible avoid the use of sunscreen, moisturisers, cosmetics, insect repellent etc, or the handling of fast-food wrappers.
- Avoid the use of reusable freezer blocks.

### 6.3.4 Soil Bore Sampling Procedures

Soil sampling completed during the Energy Depot Investigation will be achieved by utilising concrete cutter, hand auger and mini drill rig. Soil samples will be collected directly from the shovel, hand auger and push tube by hand using fresh nitrile gloves to limit the use of reusable tools and minimise cross contamination.

Intrusive investigations on site will be conducted as follows:

- A service locator will be used to identify potential underground assets in conjunction with BYDA plans;
- Lithological soil logging will be conducted based upon soil descriptions in the Unified Soil Classification System (USCS).
- Concrete cutting of a 0.5 m by 0.5 m area to allow a bulk fill sample to be obtained for qualitative and quantitative assessment of ACM, AF, and FA.
- Fill material from the 0.5 m by 0.5 m open slab area will be visually assessed for ACM, FA and FA before, during and after collection into bulk fill sample bags. Should ACM, FA or FA be observed it will be recorded and sampled.
- The presence of other anthropogenic materials will also be monitored and recorded during excavation.
- Non-destructive drilling (by hand auger) to a depth of 1.2 mBGL to clear the location of underground services.
- Advancement of soil bores by a mini-drill rig (to account for drilling indoors) to 0.5 m into natural soils, 0.5 m beyond field observations of contamination, or refusal, whichever occurs first.
- Soil sampling will be conducted nominally at:
  - The surface (i.e. 0 to 0.15 m below the surface).
  - Changes in lithology.
  - Where visual or olfactory evidence of contamination appears to be present.
  - At water strike (for installation of groundwater monitoring wells only).
  - At the base of the soil bore.
- To minimise the loss of potential volatile contaminants during sampling, samples will be placed in laboratory-supplied jars, filled to reduce headspace and transferred to an iced cooler for transport to the project laboratory.
- Collected samples will be screened for the presence of volatile contaminants using a PID. A soil sample will be collected immediately after sampling and placed into a ziplock bag. The bag will be sealed immediately and soil left to equilibrate with the headspace for at least 5 minutes. A headspace PID reading from the ziplock bag will then be taken.

- Push tubes will be visually assessed for ACM, FA or FA and, if observed, will be recorded and sampled. Nation Partners notes the push tubing is not the most effective form of excavation for field screening for asbestos however, due to the logistical restraints presented by drilling within the operational warehouse, this methodology is considered the most feasible for this investigation;
- Select soil samples from each location will be analysed to provide a representative dataset of the lithologies and identified contamination across the site.
- Borehole investigation locations will be plotted on the site layout plan.
- Borehole logs will be prepared for each investigation location.
- PFAS-specific sampling protocols in accordance with NEMP (2020) will be utilised to minimise cross-contamination or false-positives with respect to PFAS. In particular, using PFAS-free sampling consumables, and avoiding the use of Teflon coated materials.
- A new pair of nitrile gloves are worn for the collection of each sample.
- Field quality control samples, including duplicates and blanks, are collected and analysed (see details in **Table 6.2**).
- Reusable sampling equipment, including hand augers and trowels, is decontaminated using PFAS-free detergent between the collection of each sample, and rinsate samples are collected to demonstrate decontamination.
- All samples are transported under CoC documentation.
- Reinstatement of investigation locations to as close as possible to original form.

All designated locations will be investigated in a manner that will minimise disturbance to the site and ensure the protection of the site's environmental qualities. All borehole locations will be backfilled and reinstated flush with the original ground surface.

### 6.3.5 Testpit Sampling Procedures

Asbestos sampling will be achieved through mechanical excavation (excavator) of testpits, and is to be conducted according to the following methodology:

- Underground service locating at proposed sampling locations.
- Concrete cutting 40 x approximately 0.8 m by 2.0 m areas to allow advancement of test pits to approximately 2 mBGL.
- Removal of the concrete with an excavator with hammer attachment.
- Collection of two bulk fill sample per location for qualitative and quantitative assessment of ACM, AF, and FA.
- Test pit locations will be backfilled with spoil and broken concrete slab, with the surface to be reinstated with road-plates. Some locations will not require road plates due to lack of vehicle movement. Metro (or Linewide) will indicate to Nation Partners which locations require road plates closer to the time of fieldwork execution.
- Collection and analysis of select samples for a waste classification suite, and screening of the soil samples against the Waste Classification Guidelines (NSW EPA, 2014) to supplement the existing waste classification dataset.

## 6.4 Sample Naming Convention

The following naming convention will be adopted for the investigation:

- Soil bore location: commencing at CPR-SB01;
- Asbestos samples from testpits: CPR-TP01;
- Groundwater well: utilising existing nomenclature;
- QA/QC field duplicate pairs:

- Commencing at QA-SB01/QC-SB01 for soil bore samples.
- Commencing at QA-TP01/QC-TP01 for testpit samples.
- Commencing at QA-MW01/QC-MW01 for groundwater samples.
- Rinsate samples: RIN01\_DATE, RIN02\_DATE (e.g. RIN01\_20230601) sequential for each rinsate sample taken;
- Trip blanks: TB01\_DATE, TB02\_DATE (e.g. TB01\_20230601) sequential for each day a batch is sent to the laboratory; and
- Trip spikes: TS01\_DATE (e.g. TS01\_20230601) sequential for each day a batch is sent to the laboratory.

## 6.5 Sample Handling and Transport

Samples will be placed directly into an ice chilled cooler following collection. The cooler will be re-iced each day of storage and again prior to transport to the laboratory. Re-useable ice packs will not be used in accordance with NEMP (2020). Samples will not be held longer than three days prior to transport to the laboratory under standard chain-of-custody procedures.

## 6.6 Quality Controls and Procedures

The following quality control procedures will be put in place to ensure the site investigation meets the quality requirements established in the DQOs.

### Equipment Calibration and Quality Control

All field equipment will be calibrated prior to use, and calibration certificates will be obtained and stored.

### Field Quality Control

Nation Partners has allowed for QA/QC samples to be collected and analysed in accordance with relevant standards. Sample duplicate frequency in accordance with the PFAS NEMP (therefore exceeding the NEPM [2013] required 10%) will be undertaken and has been included in our schedule.

Rinsate samples will be collected from reusable sampling equipment and analysed for PFAS. Field blanks comprising pouring laboratory provided PFAS-free rinsate water directly into sample containers will also be collected and analysed for PFAS to assess for the potential presence of PFAS in the PFAS-free water and/or the introduction of PFAS from ambient site conditions.

**Table 6.3: Laboratory Assurances and Quality Control**

Quality Control Procedures	Description
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.
Reagent Blanks	The reagent blank sample is a laboratory prepared sample containing the reagents used to prepare the sample for final analysis. The purpose of this procedure is to identify contamination in the reagent materials and assess potential bias in the sample analysis due to contaminated reagents. The QC criterion is no detectable contamination in the reagents, and each analysis procedure should be subject to a reagent blank analysis.
Laboratory Duplicates	Laboratory duplicates are field samples that are split in the laboratory and subsequently analysed a number of times in the same batch. These sub-samples are selected by the laboratory to assess the accuracy and precision of the analytical method. Internal laboratory duplicates are to be performed at a frequency of 1 per 10 samples. Relative percentage difference values between the original and duplicate samples should be less than 30%.
Laboratory Control Standard (LCS)	A laboratory control standard (LCS) is a standard reference material used in preparing primary standards. The concentration should be equivalent to a mid-range standard to confirm the primary calibration. Laboratory control samples are to be performed at a frequency of 1 per 20 samples or at least one per analytical run. LCS recoveries should be within the stated laboratory control limits of 70% to 130%.

Quality Control Procedures	Description
Matrix Spikes / Matrix Spike Duplicates	Matrix Spikes / Matrix Spike Duplicates are field samples to which a predetermined stock solution of known concentration has been added. The samples are then analysed for recovery of the known addition. Recoveries should be within the stated laboratory control limits of 70% to 130%, and duplicates should have a relative percentage difference (RPD) of less than 50%.
Surrogate Spikes	Surrogate spikes provide a means of checking, for every analysis, that no gross errors have occurred at any stage of the procedure leading to significant analyte loss. Recoveries should be within the stated laboratory control limits of 70% to 130%.
QA/QC Conclusion	The QA/QC indicators should either all comply with the required standards or show no variations that would have no significant effect on the quality of the data.

### Survey Control

A site plan will be prepared prior to the site visit including approximate sampling locations. Global Positioning System (GPS) coordinates will be made of each sampling location on the day of the site investigation. The plan will allow appropriate orientation on site and minimise the risk of incorrect sampling locations.

### Data Review and Verification

All field data and laboratory analytical data will be compiled and evaluated against the project DQOs upon completion of the site investigation. Laboratory results will be checked for missing or incorrect data.

### Decontamination

Decontamination protocols consistent with the methods recommended in the PFAS NEMP (2020), will be used throughout the soil sampling program to reduce the risk of cross contamination between samples and sample locations. Relevant sampling equipment will be decontaminated between samples and sample locations using a phosphate-free detergent and a final rinse with potable water.

Decontamination procedures will be in place during the site investigation, including:

- The use of new disposable gloves for the collection of each sample;
- Decontamination of the sampling equipment between each sampling location (using PFAS-free detergent where required); and
- The use of dedicated sampling containers provided by the laboratory.

## 6.7 Waste

Excess spoil from soil sampling and purged groundwater will be stored in dedicated waste disposal drums on-site and be classified for off-site disposal. Waste classification letters and disposal dockets are to be retained and provided at the completion of the fieldworks.

# 7 Investigation Assessment Criteria

Sydney Metro intends to divest the site, potentially to be redeveloped for a mixed use residential, school and public open space land use. Because the land use for the potential redevelopment is unknown, investigation levels for a residential land use with accessible soil (A) and residential with minimal access to soil (B) have been considered. Further, with regards to the objective of informing the RAP addendum and RCE, waste classification guidelines will also be considered during the investigation.

## 7.1 Soil Investigation Levels

For the purposes of this site investigation, the following soil investigation levels (ILs) have been adopted from Schedule B(1) of the NEPM, which have been endorsed by the NSW EPA.



The NEPM guidelines define an 'Investigation Level' as the concentration of a contaminant above which further appropriate investigation and evaluation will be required. ILs and Screening Levels (SLs) will be used by this investigation to identify those contaminant(s) that should be further investigated, if required.

The NEPM guidelines provide ILs and SLs for the protection of human health (Health-based Investigation Levels [HILs] and Health-based Screening Levels [HSLs]), and for the protection of ecosystems (EILs and ESLs).

### 7.1.1 Health Investigation Levels

Schedule B(1) of the NEPM provides a range of HILs for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure.

The HILs are generic to all soil types and apply generally to a depth of up to 3 m below the surface for residential use. Site-specific conditions should determine the depth to which HILs apply for other land uses. They are intentionally conservative and are based on a reasonable worst-case scenarios.

The primary HILs adopted for this site investigation are HIL A and HIL B to account for all potential future land uses at the Site identified in **Section 2.2**.

- HIL A – residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools.
- HIL B – residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.

The HILs do not provide investigation levels for:

- TRH and BTEX, therefore the HSLs specified in the amended NEPM (2013) are considered; and
- PFAS, therefore the soil criteria defined in the PFAS NEMP 2020 have been considered.

The project HILs will be relevant to all soils present on the site in the context of potential exposure.

### 7.1.2 Environmental Investigation Levels

The NEPM (2013) includes ecological investigation levels (EILs) for selected heavy metals and organic substances and ecological screening levels (ESLs) for petroleum hydrocarbons to assess risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2 m of soil.

### 7.1.3 Management Limits

The NEPM (2013) includes 'management limits' for TPH. Management limits are applied after consideration of relevant HSLs. Where TPH concentrations are less than the adopted HSL, consideration will be given to management limits for a commercial/industrial land use.

Management limits for coarse soils have been conservatively assumed, though will be reassessed following fieldworks.

### 7.1.4 Asbestos

The NEPM provides specific guidance for the assessment of asbestos in soils based on the WA DoH *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia* (WA DoH 2009). The DoH Guidelines identify three groups of asbestos contamination:

- ACM: asbestos which is bound in a matrix (in sound condition) which cannot pass through a 7 mm x 7 mm sieve;

- FA: friable asbestos material, such as severely weathered ACM and loose fibrous material such as insulation products. FA is defined as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure; and
- AF: includes free fibres of asbestos, small fibre bundles and ACM fragments that pass through a 7 mm x 7 mm sieve.

A quantitative analysis of potential ACM will be performed and compared with the following NEPM (2013) criteria to reflect intended future uses of the site:

- FA – 10 mg/kg (0.001%) weight of total weight (w/w) asbestos.
- AF – 10 mg/kg (0.001%) w/w asbestos.
- ACM (Residential A) – 100 mg/kg (0.01%) w/w asbestos.
- No asbestos in surface soils.

### 7.1.5 Waste Classification

The NSW EPA (2014) *Waste Classification Guidelines* will be used to consider the offsite disposal of soil at the site for materials from construction works requiring disposal and to inform potential future management options. This will include the October 2016 addendum to the guidelines for the classification of waste containing PFAS.

## 7.2 Groundwater Investigation Levels

Schedule B(1) of the NEPM provides specific guidance on the assessment of groundwater potentially affected by contamination. Drinking water and freshwater groundwater investigation levels (GILs) derived from Table 1C of Schedule B(1) have been adopted for this investigation.

The GILs do not provide investigation levels for:

- TRH and BTEX vapour inhalation pathways from groundwater, therefore the HSL A specified in the NEPM are considered; and
- PFAS, therefore the recreation, drinking and freshwater (95% and 99%) criteria defined in the PFAS NEMP 2020 have been considered.

For basement scenarios associated with the potential future high-density residential scenario proposed for the site, groundwater will be assessed against HSL-D (commercial/industrial) for silty soils at 2 to 4m depth, in accordance with Schedule B(1) of the NEPM.



## 8 Field Planning

The following plans are to be prepared for the fieldworks.

### 8.1 Health Safety and Environment Plan

In accordance with Sydney Metro and LineWide requirements, a HSEP will be developed by the Nation Partners for work to be undertaken at the site. This plan will address issues relating to contamination and sampling procedures, vehicle movements, and other issues considered relevant. The HSEP will also address appropriate personal protective equipment (PPE) and emergency procedures. Nation Partners staff conducting the field investigation will be appropriately trained in health and safety. The HSEP will be required to be consistent with the LineWide Construction Environmental Management Plan<sup>4</sup> and relevant sub-plans.

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<sup>4</sup> <https://www.sclww.com.au/documents/>



## 9 Reporting

### 9.1 Pre-Remediation Investigation Report

Following completion of the site investigations Nation Partners will prepare a draft Pre-Remediation Investigation report in accordance with the DSI requirements in NSW EPA (2020). The report will summarise and interpret the field and laboratory data collected during the site investigation works to close out the identified data gaps.

### 9.2 RAP Addendum

Following completion of the pre-remediation investigation sampling and Nation Partners Pre-Remediation Investigation report, a RAP Addendum will be prepared. The RAP Addendum will document the revised remediation extent with respect to asbestos in soils (or other unexpected finds) and the in-situ waste classifications.

### 9.3 RCE Update

Following the preparation of the RAP Addendum, the previous RCE will be updated with respect to the revised remediation scope, reduced uncertainty for previous contingency items, and consistency with current market rates for the works.

## 10 Contingencies

Unforeseen conditions may be encountered in executing the work required to meet the project objectives, such as difficult ground condition or unexpected contamination. Should such conditions be encountered that might require contingent actions which would constitute a variation to the agreed project fee, Nation Partners will seek approval from Sydney Metro and Nation Partners before proceeding with additional works that may be required.

The Nation Partners project manager will be responsible for raising and discussing contingency conditions and appropriate actions with the Sydney Metro project manager to agree on appropriate actions. In all cases, any changes to the work scope will be detailed in writing between Nation Partners and Sydney Metro, and the Nation Partners will seek signature approval for any resulting cost adjustments.

Should events arise that significantly alter the work plan from that outlined in this SAQP, the Site Auditor will also be involved in discussing the new works scope.

### 10.1 Heritage and Unexpected Finds

Should heritage items or unexpected finds be encountered, the following Sydney Metro procedures (see **Appendix B**) will be followed:

- The Aboriginal and Historic Heritage Management Procedure (SMCSWTSE-JCG-TPW-EM-MPR-003005);
- Unexpected Heritage Finds Procedure (SM-20-00099497); and
- Exhumation Management Procedure (SM-20-00099495).

## 11 Statement of Limitations & Disclaimer

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# Appendices





# A Figures



**Figure 1: Site Location**

*Chatswood Pre-Remediation Investigation Sampling Analysis and Quality Plan*

**Legend**

 Site Boundary



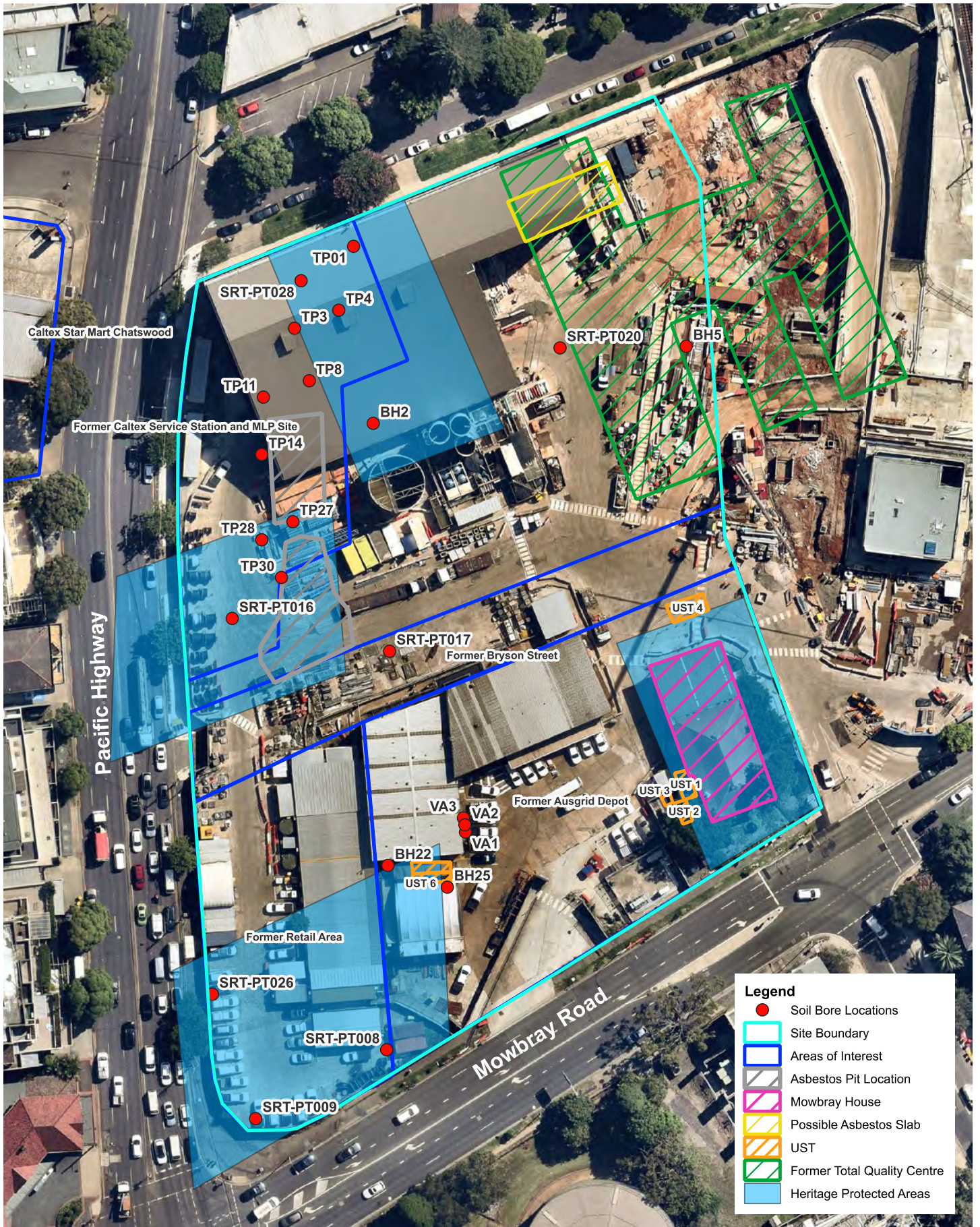
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**Figure 2: Previous Soil Sampling Locations**

Chatswood Pre-Remediation Investigation Sampling Analysis and Quality Plan

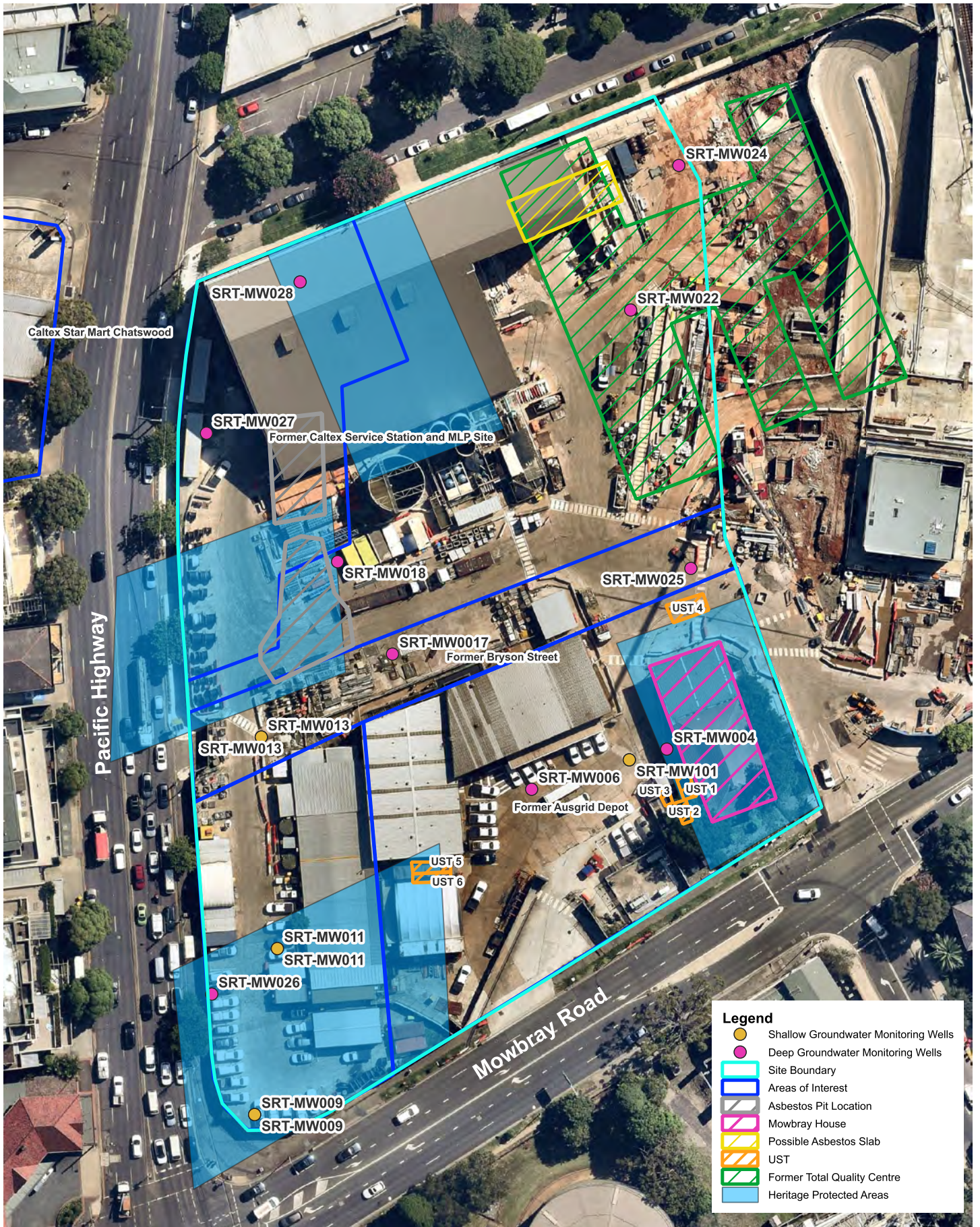
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**Figure 3: Previous Groundwater Sampling Locations**

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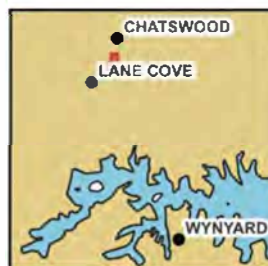


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**Figure 4: Proposed Sampling Locations**  
 Chatswood Pre-Remediation Investigation  
 Sampling Analysis and Quality Plan

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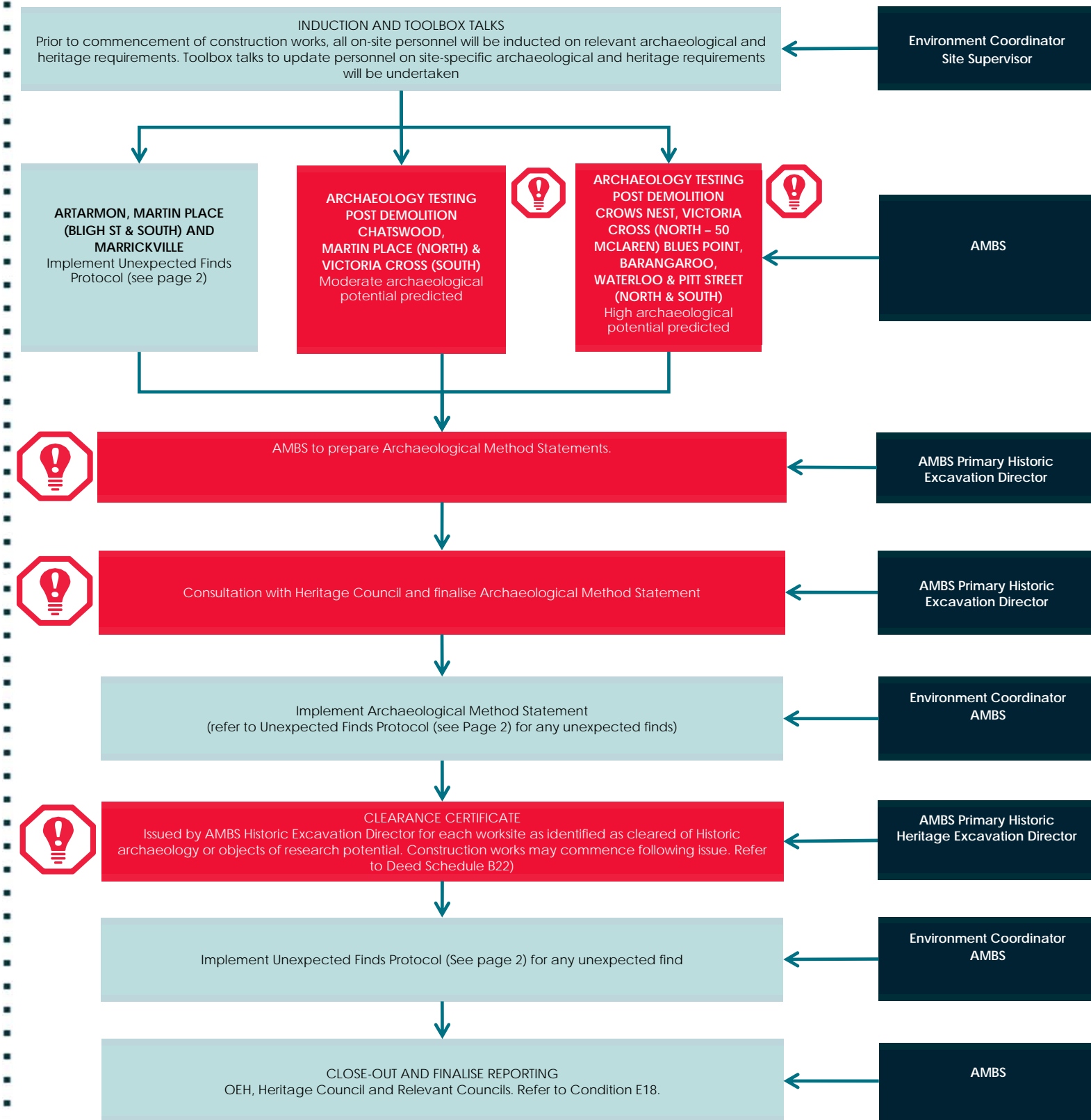
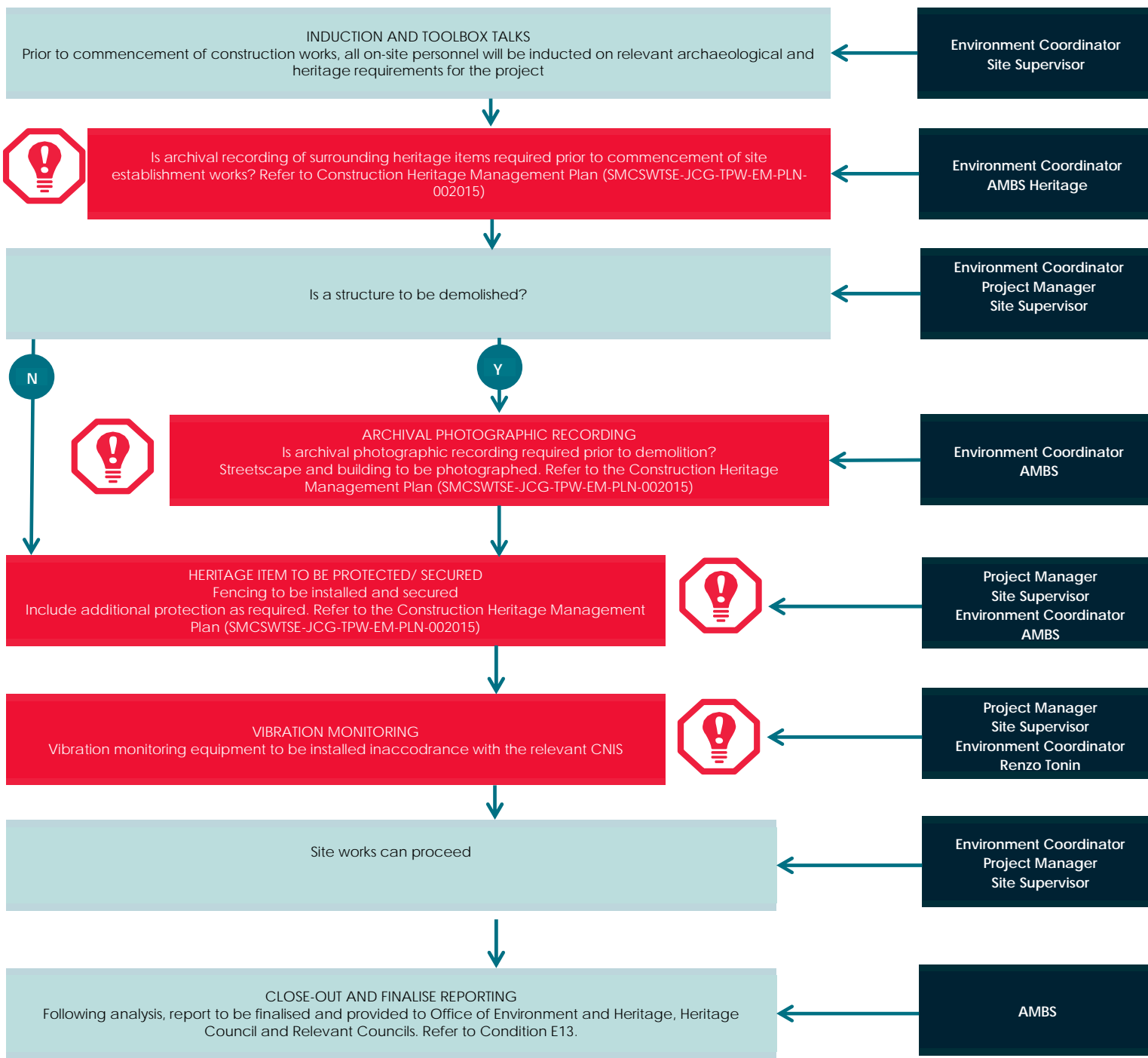
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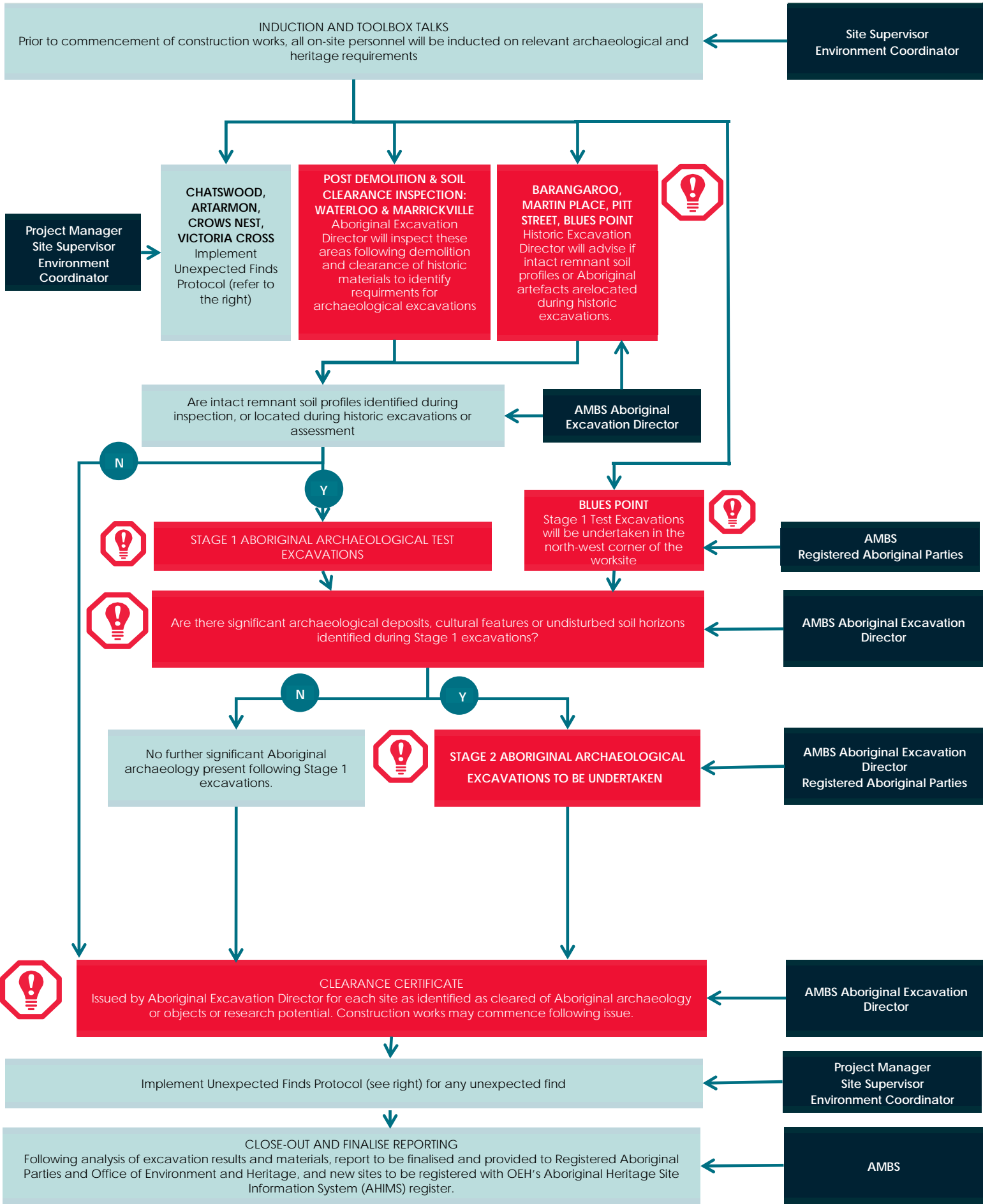
## B Sydney Metro Aboriginal and Historic Heritage Management Procedure

## ARCHIVAL RECORDING AND PROTECTION PROTOCOL

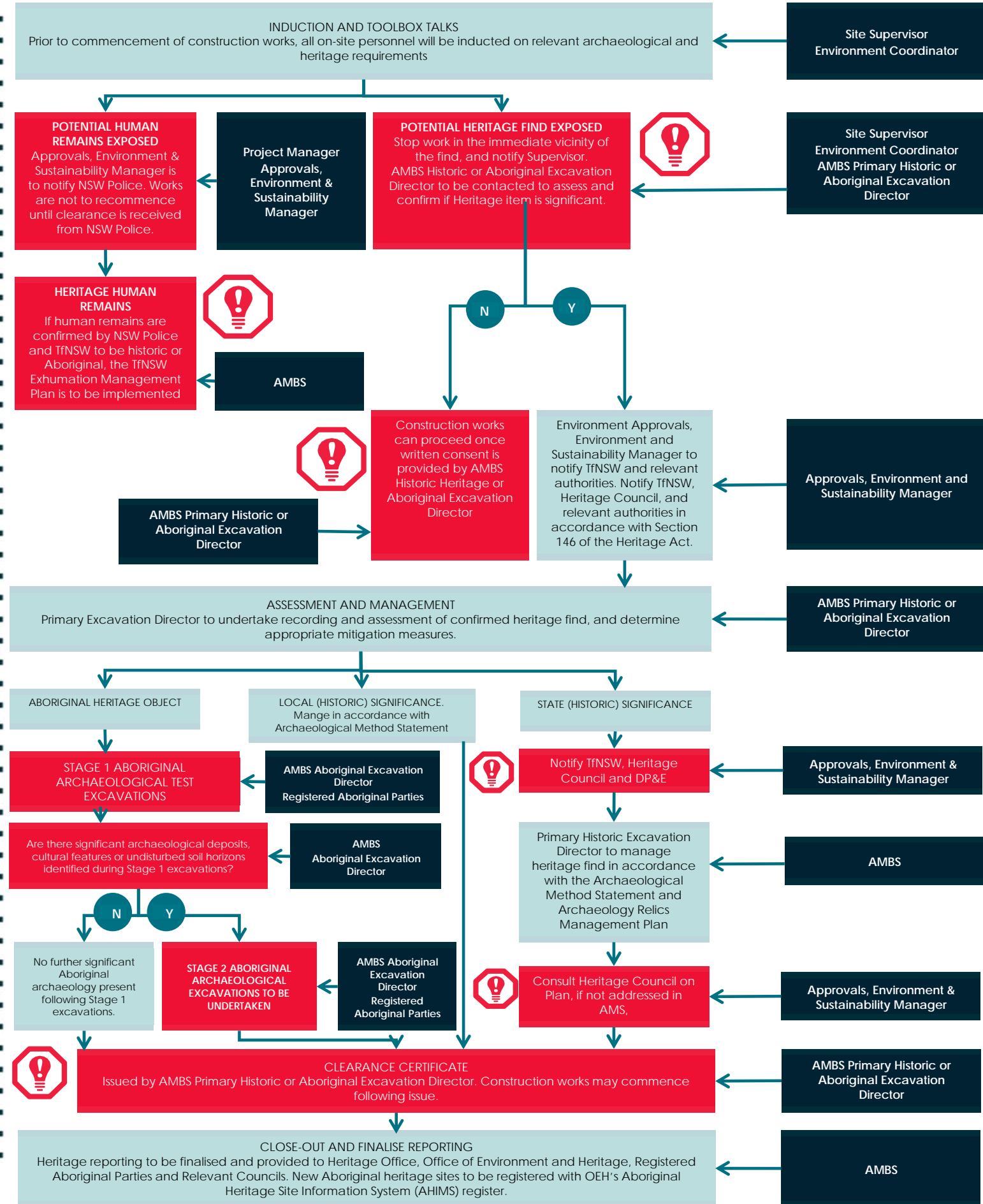
## HISTORICAL ARCHAEOLOGICAL SITES PROTOCOL



## ABORIGINAL ARCHAEOLOGICAL SITES PROTOCOL



## ABORIGINAL AND HISTORIC HERITAGE UNEXPECTED FINDS PROTOCOL







# Unexpected Heritage Finds Procedure

SM-20-00099497

Metro Body of Knowledge (MBoK)

<b>Applicable to:</b>	Sydney Metro
<b>Document Owner:</b>	Senior Heritage Advisor
<b>System Owner:</b>	Deputy Chief Executive, Customer Operations & Outcomes
<b>Status:</b>	Final
<b>Version:</b>	5.0
<b>Date of issue:</b>	24 April 2023
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<b>Name of Approver:</b>	Carolyn Riley
<b>Role / Title:</b>	Executive Director Environment, Sustainability and Planning
<b>Date Approved:</b>	24 April 2023
<b>Digital Signature:</b>	

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# 1. Introduction

## 1.1. Purpose

This Procedure has been prepared to provide a consistent approach to the management of unexpected Aboriginal and historic heritage uncovered during Sydney Metro activities. It applies to all Sydney Metro activities, both the pre-construction (prior to the Construction Heritage Management Plan approval) and construction phase (post Construction Heritage Management Plan approval) and pre or post-approval activities that are subject to the *NSW Heritage Act (1977)* (Heritage Act) and the *National Parks and Wildlife Act 1974* (NPW Act).

In NSW, there are strict laws to protect and manage both Aboriginal and historic heritage. As a result, appropriate management measures need to be implemented to avoid or minimise impacts, ensure compliance with statutory requirements, and to minimise the risk of penalties to individuals, Sydney Metro, and its contractors. This Procedure outlines Sydney Metro's obligations under the Heritage Act, NPW Act and the *Coroner's Act 2009* and State Significant Infrastructure (SSI) or State Significant Development (SSD) approvals issued by NSW Department of Planning and Environment where applicable.

Note that a Contractor must not amend this Procedure or use a different procedure without the prior approval of Sydney Metro.

This Procedure must be read in conjunction with the relevant approval conditions, contract documents and other plans and procedures including [SM-20-00099495 Exhumation Management Procedure](#), in addition to any other relevant documents as developed by the contractor for the delivery of Sydney Metro activities.

## 1.2. Scope

This Procedure applies to the discovery of any unexpected heritage item, where the find is not anticipated in an approved Archaeological Research Design (ARD) or Archaeological Method Statement (AMS) or other project specific document related to heritage. It applies to all Sydney Metro activities.

This Procedure must be followed by all Sydney Metro staff, contractors, subcontractors or any person undertaking work for Sydney Metro. It includes references to some of the relevant legislative and regulatory requirements but is not intended to replace them.

This Procedure *does not apply* to the discovery and disturbance of a heritage item:

- As a result of investigations being undertaken in accordance with the *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW4376 2010*; an Aboriginal Heritage Impact Permit (AHIP) issued under the NPW Act; or a permit approval issued under the Heritage Act; or
- As a result of construction related activities, where the disturbance is permissible in accordance with an AHIP, or an approval issued under the Heritage Act or State SSI or SSD planning approval; or
- Of local significance, where the find is identified and anticipated to occur in an AMS or ARD.

Construction Environment Management Plans (CEMPs), which are reviewed by the Sydney Metro Heritage team, should reference or include this Procedure. Where there is an approved CEMP, it must be followed in the first instance. Where there is a difference between approved

CEMPs and this Procedure, the approved CEMP must be followed. Where an approved CEMP does not provide sufficient detail on particular issues, this Procedure should be used as a reference.

## 1.3. Definitions and abbreviations

### 1.3.1. What is an unexpected heritage find?

An 'unexpected heritage find' can be defined as a:

- Unanticipated discovery of an Aboriginal object or archaeological work or relic, which Sydney Metro does not have approval to disturb and/or is not covered under an existing management process or plan
- Find that has not been identified or assessed in a project assessment or document related to heritage
- Find that is not referenced in an archaeological research design (ARD) or archaeological method statement (AMS)
- Find that is not covered by an existing approval under the NPW Act or Heritage Act.

### 1.3.2. Abbreviations

All terminology in this Procedure is taken to mean the generally accepted or dictionary definition. Acronyms and terms specific to this document are listed below.

Other terms and jargon are defined within the [SM-17-0000203 Sydney Metro Glossary](#).

**Table 1: Terms/acronyms and definitions**

	Definitions
<b>Aboriginal object</b>	An Aboriginal object is any deposit, object or material evidence (not being a handcraft made for sale) relating to the Aboriginal habitation of the area, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.
<b>AHIP</b>	Aboriginal Heritage Impact Permit.
<b>AMS</b>	Archaeological Method Statement.
<b>ARD</b>	Archaeological Research Design.
<b>CEMP</b>	Construction Environmental Management Plan.
<b>CoA</b>	Conditions of Approval.
<b>CSSI</b>	Critical State Significant Infrastructure.
<b>Disturbance</b>	Disturbance is considered to be any physical interference to an item that results in it being destroyed, defaced, damaged, harmed, impacted or altered in any way (this includes archaeological investigation activities).
<b>EP&amp;A Act</b>	NSW <i>Environmental Planning and Assessment Act 1979</i> .
<b>Excavation Director</b>	A person that has been determined by the Heritage Council of NSW or its delegate to meet the <i>Criteria for Assessment of Excavation Directors</i> (4 September 2019 and as updated) and can therefore competently archaeologically investigate a site of either local and/or state significance.
<b>Heritage Act</b>	NSW <i>Heritage Act 1977</i> .
<b>Heritage NSW</b>	Formerly Office of Environment and Heritage (OEH). Now Heritage NSW .

	Definitions
<b>NPW Act</b>	NSW <i>National Parks and Wildlife Act 1974</i> .
<b>Relic</b>	A relic means any deposit, artefact, object or material evidence that: <ol style="list-style-type: none"> <li>relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and</li> <li>is of State or local significance.</li> </ol>
<b>SSD</b>	State Significant Development.
<b>SSI</b>	State Significant Infrastructure.

## 1.4. Accountabilities

The Executive Director, Environment, Sustainability & Planning is accountable for this Procedure including approving the document, monitoring its effectiveness and performing a formal document review.

Direct Reports to the Chief Executive are accountable for ensuring the requirements of this Procedure are implemented within their area of responsibility.

Direct Reports to the Chief Executive who are accountable for specific projects/programs are accountable for ensuring associated contractors comply with the requirements of this Procedure.

## 2. Types of unexpected heritage finds and their statutory protections

Project, field and environmental personnel (including construction contractors) are critical to the early identification and protection of unexpected heritage finds.

[Appendix A: Examples of unexpected heritage finds](#) illustrates the wide range of heritage items uncovered to date during Transport for NSW projects and provides an understanding of what unexpected finds may look like.

Unexpected heritage finds are categorised as either:

- Aboriginal objects;
- Historic (non-Aboriginal) heritage items; or
- Human skeletal remains.

The relevant legislation that applies to each of these categories is described below.

### 2.1. Aboriginal objects

The NPW Act provides the basis for the care, protection and management of Aboriginal objects and places in NSW.

An Aboriginal object is defined as: *any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains.*

An 'Aboriginal place' is an area declared by the Minister administering the Act to be of special significance with respect to Aboriginal culture. An Aboriginal place does not have to contain physical evidence of occupation (such as Aboriginal objects).

Under section 87 of the Act, it is an offence to harm or desecrate an Aboriginal object or place. There are strict liability offences. An offence cannot be upheld where the harm or desecration was authorised by an AHIP and the permit's conditions were not contravened. Defences and exemptions to the offence of harming an Aboriginal object or Aboriginal place are provided in section 87, 87A and 87B of the Act. A person must notify Heritage NSW if a person is aware of the location of an Aboriginal object.

Penalties for some of the offences can include two years imprisonment and/or up to \$550,000 (for individuals), and a maximum penalty of \$1.1 million (for corporations).

Examples of Aboriginal objects include stone artefacts, shell middens, axe grinding grooves, pigment or engraved rock art, burials and scarred trees.

### IMPORTANT!

**All Aboriginal objects, regardless of significance, are protected under law.**

If any impact is expected to an Aboriginal object, an AHIP is usually required from Heritage NSW. When a person becomes aware of an Aboriginal object, they must notify Heritage NSW about its location. Assistance on how to do this is provided in section 4 (Step 5).

## 2.2. Historic heritage items

The Heritage Act provides for the care, protection and management of heritage items in NSW. Historic heritage include:

- Archaeological 'relics' as defined under the Heritage Act; and
- Other historic heritage such as works, buildings or movable objects, which are not considered 'relics' under the Act.

### 2.2.1. Archaeological relics

Under section 139, it is an offence to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed, unless the disturbance or excavation is carried out in accordance with an excavation permit issued by Heritage NSW under the Act.

A relic is defined as: *'any deposit, artefact, object or material evidence that: (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and (b) is of State or local heritage significance.'*

A person must notify Heritage NSW, if a person is aware or believes that they have discovered or located a relic (section 146). Penalties for offences under the Heritage Act can include six months imprisonment and/or a fine of up to \$1.1 million.

### IMPORTANT!

**All relics are subject to statutory controls and protection.**

If a relic is likely to be disturbed, an approval is usually required from the Heritage Council of NSW. When a person discovers a relic, they must notify the Heritage Council of NSW of its location.

### 2.2.2. Other historic heritage

Some historic heritage items are not considered to be 'relics', but are instead referred to as works, buildings, or movable objects. Examples of these items include culverts, former road surfaces, retaining walls, tramlines, rail track or sleepers, cisterns, fences, buildings and conduits.

Usually archaeological relics are uncovered via a process of excavation or soil removal. When an unexpected find is uncovered, an archaeological excavation permit under section 140 or section 60 of the Heritage Act may be required to further investigate or remove it if investigation is not covered by an existing approval. In contrast, 'other historic items' either exist above the ground surface (for example a shed), or they are designed to operate and exist beneath the ground surface (for example a culvert). They may also need a permit to alter, disturb or remove them if there is not an approval already in place.

### 2.3. Human skeletal remains

[SM-20-00099495 Exhumation Management Procedure](#) provides a more detailed explanation of the approval processes related to human skeletal remains.

Human skeletal remains can be classified as:

- Reportable deaths;
- Aboriginal objects; or
- Relics.

Where it is suspected that less than 100 years has elapsed since death, human skeletal remains come under the jurisdiction of the State Coroner and the *Coroners Act 2009* (NSW). Under s35(2) of the Act, a person must report a death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old regardless of ancestry. Public health controls may also apply.

Where the remains are suspected of being more than 100 years old, they are considered to be either Aboriginal objects or non-Aboriginal relics, depending on the ancestry of the individual. Aboriginal human remains are protected under the NPW Act, while non-Aboriginal heritage remains are protected under the Heritage Act.

The approval and notification requirements of these Acts are described above in Sections 2.1 and 2.2. The discovery of Aboriginal human remains also triggers notification requirements to the Commonwealth Minister for the Environment under s20 (1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

#### **IMPORTANT!**

**All human skeletal remains are subject to statutory controls and protections.**



All bones must be treated as potential human skeletal remains and work around them must stop while they are protected and investigated urgently.

### 3. Unexpected heritage finds procedure

On discovering something that could be an unexpected heritage item on a Sydney Metro project, the following procedure must be followed. There are seven steps in the procedure.

**IMPORTANT!**

Sydney Metro may have approval to impact certain heritage items during construction. If you think that you may have discovered a heritage item and you are unsure whether an approval is in place or not, **STOP** work and follow this Procedure.

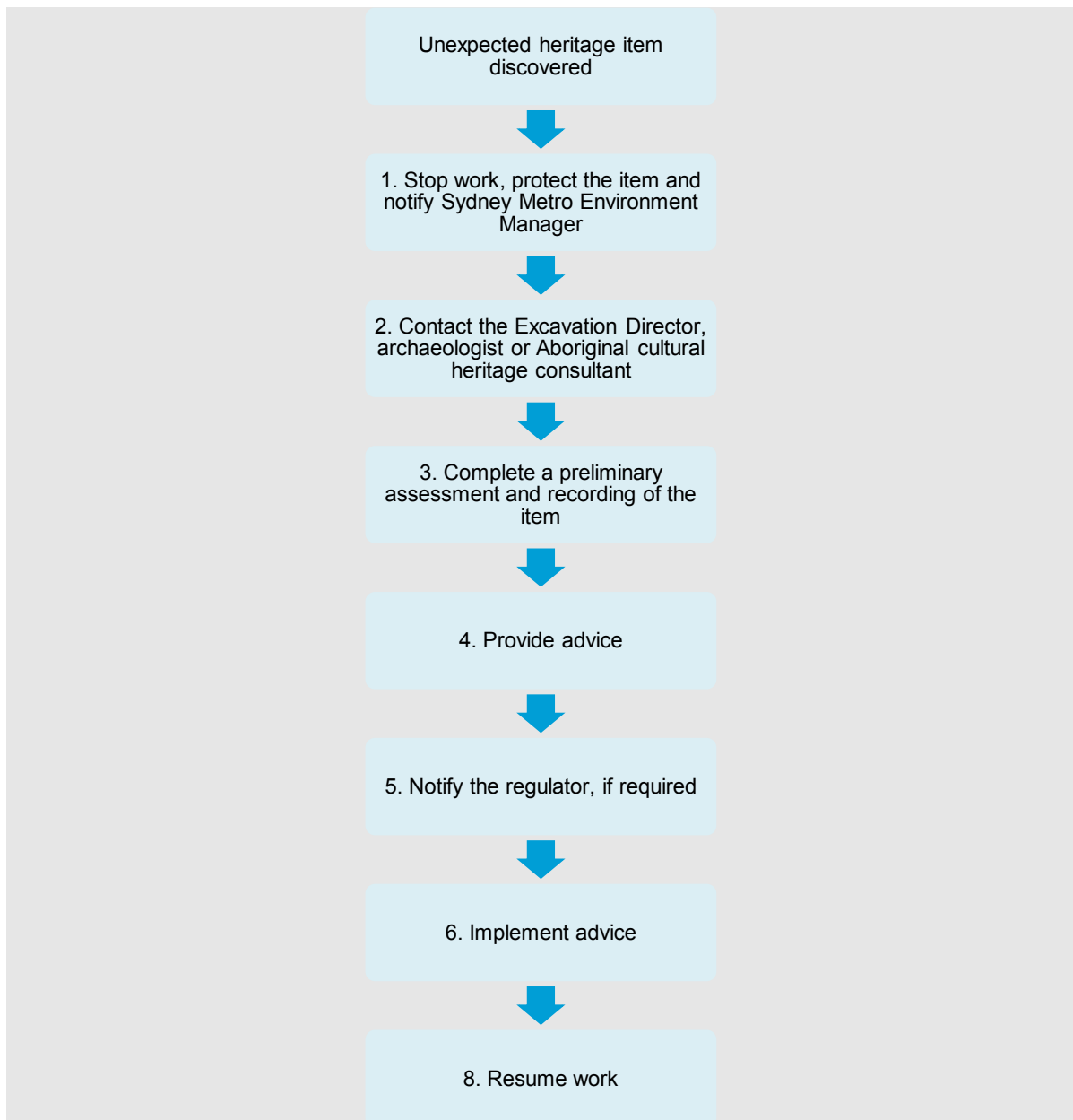


Figure 1: Summary of steps to be taken on the discovery of an unexpected heritage item

Table 2: Specific tasks to be implemented following the discovery of an unexpected heritage item

Step	Task	Responsibility	Guidance and tools
<b>1</b>	<b>Stop work and protect the item</b>		
1.1	Stop all work in the immediate area of the item and notify the Project Manager	Contractor/ Supervisor	<a href="#">Appendix A: Examples of unexpected heritage finds</a>
1.2	Establish a 'no-go zone' around the item. Use high visibility fencing, where practical. No ground disturbing work is to be undertaken within this zone until further archaeological investigations are completed, and if required, appropriate approvals are obtained.  Inform all on-site personnel about the no-go zone.	Contractor's Project Manager or Supervisor	
<b>2</b>	<b>Engage an archaeologist</b>		
2.1	Contact the nominated Excavation Director, archaeologist or Aboriginal cultural heritage consultant to discuss the location and nature of the item and arrange an inspection. The project CEMP should contain the contact details of the archaeologist.  Provide as much information as possible to the Excavation Director, archaeologist or Aboriginal cultural heritage consultant, including photographs of the item.  Inform the Sydney Metro Environment Manager and keep them involved in the process. The Environment Manager will inform the Sydney Metro Senior Heritage Advisor.	Contractor's Project Manager	
2.2	Where there is no project Excavation Director, archaeologist or Aboriginal cultural heritage consultant engaged for the work, engage a suitably qualified consultant to assess the find.  If the find is likely to be an Aboriginal object, engage a suitably qualified and experienced Aboriginal cultural heritage consultant.  If the find is a historic heritage item, engage a suitably qualified and experienced historical archaeologist.	Contractor's Project Manager	
<b>3</b>	<b>Preliminary assessment and recording</b>		
3.1	Occasionally, the Excavation Director, archaeologist or Aboriginal cultural heritage consultant may determine from the photographs provided at Step 2.1 that it is not necessary to inspect the item because no heritage constraint exists for the project (for example the item is not an Aboriginal object or archaeological relic).  This advice should be provided in writing (for example via email or letter with the consultant's name and company clearly identifiable) to the Sydney Metro Project Manager, Environment Manager and Senior Heritage Advisor.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	Proceed to Step 7
3.2	Arrange access for the Excavation Director, archaeologist or Aboriginal cultural heritage consultant to inspect the item as soon as practicable. In most cases, a site inspection is required to conduct a preliminary assessment.	Contractor's Project Manager/ Excavation Director	

Step	Task	Responsibility	Guidance and tools
3.3	<p>Subject to the Excavation Director, archaeologist or Aboriginal cultural heritage consultant's assessment, work may recommence at a set distance from the item.</p> <p>This is to protect any other archaeological evidence that may exist in the vicinity, which may have not yet been uncovered.</p> <p>The 'no-go zone' established in Step 1.2 may need to be adjusted to reflect the area of archaeological potential, as determined by the Excavation Director, archaeologist or Aboriginal cultural heritage consultant.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
3.4	<p>Has the item been damaged or harmed?</p> <p>If yes, record the incident in the Incident Management System. Implement any additional reporting requirements related to the planning approval and CEMP where relevant.</p>	Contractor's Project Manager/ Excavation Director, archaeologist or Aboriginal cultural heritage consultant	
3.5	<p>Can the work avoid further impact to the item?</p> <p>Project Manager to confirm with Sydney Metro Environment Manager.</p>	Contractor's Project Manager	
3.6	<p>Record the item and complete the Unexpected Heritage Item Recording Form.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	<p><a href="#">Appendix B: Unexpected heritage find recording form</a></p> <p><a href="#">Appendix C: Photographing unexpected heritage items</a></p>
3.7	<p>Is the item likely to be bone?</p> <p>If yes, follow the steps in <a href="#">Appendix D</a> 'Uncovering bones'.</p> <p>Where it is obvious that the bones are human remains, you must notify the local police by telephone immediately.</p> <p>They may take command of all or part of the site.</p> <p>Also refer to <a href="#">SM-20-00099495 Exhumation Management Procedure</a>.</p> <p>If no, proceed to the next step.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	
3.8	<p>The Excavation Director, archaeologist or Aboriginal cultural heritage consultant may provide advice after the inspection and preliminary assessment that no heritage constraint exists for the project (for example the item is not an Aboriginal object or relic).</p> <p>This advice should be provided in writing (for example via email or letter with the consultant's name and company clearly identifiable) to the Sydney Metro Project Manager, Environment Manager and Senior Heritage Advisor.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	Proceed to Step 7
3.9	<p>Where required, seek additional specialist technical advice (such as a forensic or physical anthropologist to identify skeletal remains).</p> <p>The Excavation Director, archaeologist or Aboriginal cultural heritage consultant can provide contacts for such specialist consultants.</p>	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	

Step	Task	Responsibility	Guidance and tools
<b>4</b>	<b>Provide advice</b>		
4.1	The Excavation Director, archaeologist or Aboriginal cultural heritage consultant should provide written advice with input from Registered Aboriginal Parties where appropriate. The plan should include as a minimum a) a description of the item, b) an assessment of the significance of the item, c) approval or statutory notification requirements, d) reporting requirements, e) consultation requirements, and f) relevance to other project approvals or management plans.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	<a href="#">Appendix D: Archaeological/heritage advice checklist</a> <b>Other references</b> DECCW 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 DECCW 2010, Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW Heritage Branch 2009, Assessing Significance for Historical Archaeological Sites and 'Relics'
4.2	In preparing the advice, the Excavation Director, archaeologist or Aboriginal cultural heritage consultant must review the CEMP, heritage sub-plans, conditions of project approval and associated heritage assessment documentation (for example an Environmental Impact Statement Technical Paper). The Excavation Director, archaeologist or Aboriginal cultural heritage consultant must determine if the item is consistent with previous heritage or project approvals or management plans. The Project Manager must provide all relevant documents to the Excavation Director to assist with this.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
4.3	The Excavation Director, archaeologist or Aboriginal cultural heritage consultant must submit this advice as a report, letter or email to the Project Manager as soon as practicable.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant	
4.4	The Project Manager, Sydney Metro Environment Manager and Sydney Metro Senior Heritage Advisor should review the advice to ensure that all requirements are addressed and can be reasonably implemented.	Consultant's Project Manager/ Sydney Metro Environment Manager/ Sydney Metro Senior Heritage Advisor	
<b>5</b>	<b>Notify the regulator, if required</b>		
5.1	Based on the advice and any statutory requirements, is notification to Heritage NSW and the Secretary required? If no, proceed directly to Step 6. If yes, proceed to next step.	Sydney Metro Environment Manager/ Sydney Metro Senior Heritage Advisor	

Step	Task	Responsibility	Guidance and tools
5.2	<p>If notification is required, provide the required information for a section 146 notification on the Heritage NSW Heritage Management System (HMS). The Environment Manager will provide the information to the Sydney Metro Senior Heritage Advisor who will lodge the notification via HMS.</p> <p>If the relic is uncovered when a section 139 (4) exception is being used, the section 146 notification must be sent to the Heritage Council of NSW via email.</p>	Sydney Metro Environment Manager and Senior Heritage Advisor	<a href="#">Heritage NSW notification requirements</a>
5.3	A copy of the final supporting information and Unexpected Heritage Item Recording Form must be kept on file and a copy sent to the Sydney Metro Project Manager.	Sydney Metro Environment Manager/ Contractor's Project Manager	
<b>6</b>	<b>Implement advice</b>		
6.1	The advice should be modified to take into account any additional advice resulting from notification and discussions with the regulator if required.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.2	Implement advice. Where impact cannot be avoided, this could include a formal assessment of heritage significance and impact assessment, preparation of excavation or recording methodologies, consultation with Registered Aboriginal Parties and obtaining heritage approvals if required.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	DECCW 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 DECCW 2010, Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW
6.3	Where heritage approvals are required, contact the Sydney Metro Environment Manager for further advice and support. Please note there are time constraints associated with heritage approval preparation and processing.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.4	For SSI or SSD projects, or projects approved under Part 5 of the EP&A Act, assess whether the heritage impact is consistent with the project approval or if project approval modification is required from the Department of Planning, Industry and Environment or the relevant consent authority.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.5	Where statutory approvals (or project modifications) are required, impact upon Aboriginal objects or relics must not occur until heritage and planning approvals have been issued by the appropriate regulator.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	

Step	Task	Responsibility	Guidance and tools
6.6	Where statutory approval is not required but where recording is recommended by the Excavation Director, archaeologist or Aboriginal cultural heritage consultant, sufficient time and resources must be allowed for this to occur.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
6.7	Ensure short term and permanent storage locations are identified for archaeological material or other heritage material recovered from site, where required. Interested third parties (for example local Aboriginal land councils, local councils or museums) should be consulted on this issue. Contact the Excavation Director, archaeologist or Aboriginal cultural heritage consultant for advice on this issue.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
<b>7</b>	<b>Resume work</b>		
7.1	Seek written clearance to resume project work from the Excavation Director, archaeologist or Aboriginal cultural heritage consultant.  Clearance would only be given once all archaeological excavation or heritage recommendations and approvals (where required) are complete. Resumption of project work must be in accordance with all the relevant project and heritage approvals/determinations.	Contractor's Project Manager	
7.2	If required, ensure archaeological excavation/heritage reporting and other heritage approval conditions are completed in the required timeframes. This includes artefact retention repositories, conservation and/or disposal strategies.	Excavation Director, archaeologist or Aboriginal cultural heritage consultant/ Contractor's Project Manager	
7.3	If additional unexpected heritage items are discovered, this procedure must begin again from Step 1.	All	

## 4. Responsibilities

Table 3: Roles and responsibilities

Role	Responsibility
<b>Contractor/Supervisor</b>	<ul style="list-style-type: none"> <li>Stop work immediately when an unexpected heritage item is encountered. Cordon off area until Contractor Environmental Manager/Excavation Director, archaeologist or Aboriginal cultural heritage consultant advises that work can recommence.</li> <li>Manage the process of the identification, protection and mitigation of impacts on the heritage item.</li> <li>Liaise with the Sydney Metro Project Manager, Environment Manager and Senior Heritage Advisor.</li> <li>Assist the Excavation Director, archaeologist or Aboriginal cultural heritage consultant with mitigation and statutory requirements.</li> <li>Complete Incident Report and review CEMP for any changes that may be required. Proposed amendments to the CEMP if any changes are required.</li> </ul>
<b>Contractor's Project Manager</b>	Ensure all aspects of this Procedure are implemented. Advise the Contractor/Supervisor to recommence work if all applicable requirements have been satisfied and the Contractor Environmental Manager/ Excavation Director, archaeologist or aboriginal cultural heritage consultant has approved commencement of work.
<b>Contractor's Excavation Director/ archaeologist or Aboriginal cultural heritage consultant</b>	Provide expert advice to the Contractor and Sydney Metro Environment Manager on find identification, significance, mitigation, legislative procedures and requirements.
<b>Environmental Representative</b>	Ensure compliance with relevant approvals (new and existing) and the Construction Environment Management Plan.
<b>Sydney Metro Environment Manager</b>	Notify the Director Project Environment, Sustainability & Planning of find and help support Contractor with managing Incident Reporting.
<b>Sydney Metro Director Project Environment, Sustainability &amp; Planning</b>	Notify the Executive Director Environment, Sustainability & Planning of the find and management actions.
<b>Sydney Metro Senior Heritage Advisor</b>	Provide expert advice to Sydney Metro Environment Manager and project as required.

## 5. Seeking advice

Advice on this Procedure should be sought from the Sydney Metro Environment Manager in the first instance. Contractors and delivery partners should ensure their own project environment managers are aware of and understand this Procedure.

Technical archaeological or heritage advice regarding an unexpected heritage item should be sought from a suitably qualified and experienced archaeologist/Aboriginal heritage consultant.



## 6. Related documents and references

### Related documents and references

- [SM-20-00099495 Exhumation Management Procedure](#)
- [SM-17-00000096 Environmental Incident Classification and Reporting Procedure](#)
- [SM-21-00280658 Unexpected Heritage Find Recording Form](#)
- [SM-21-00280680 Archaeological Heritage Advice Checklist](#)
- [SM-21-00280708 Unexpected Heritage Discovery Notification Letter Template](#)
- 3TP-SD-015/7.0 Transport for NSW Guide to Environmental Control Map
- Roads and Maritime Services, November 2015, Unexpected Heritage Items Heritage Procedure 02
- [SM-17-00000203 Sydney Metro Glossary](#)
- Department of Environment, Climate Change and Water 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
- Department of Environment, Climate Change and Water 2010, Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW
- Heritage Branch Department of Planning 2009, Assessing Significance for Historical Archaeological Sites and 'Relics'
- Heritage NSW 2022, [Notify discovery of a relic](#), <  
https://www.environment.nsw.gov.au/topics/heritage/apply-for-heritage-approvals-and-permits/historical-archaeology/notify-discovery-of-a-relic#:~:text=Under%20Section%20146%20of%20the,section%2060%20approval%20in%20place>.

## 7. Superseded documents

### Superseded documents

There are no documents superseded as a result of this document.

## 8. Document history

Version	Date of approval	Notes
1.1	June 2017	Incorporates Environmental Representative comments
1.2	-	Amends p13 step 8 reference to s146
1.3	-	Incorporates Planning Mods 1-4 including amended CoA E20
1.4	March 2018	Incorporates Environmental Representative comments
2.0	-	Removes SSI 15-7400 COA reference
3.0	-	Revises definitions
3.1	-	Revises procedure
3.2	-	Revises roles and responsibilities
3.3	-	Minor edits and corrections
4.0	16 August 2021	Revises definitions and procedure; references the Sydney Metro Exhumation Management Procedure v5 with amendments throughout for consistency with that document. Updates to related documents and references.
5.0	24 April 2023	Minor clarifications and updates to the process for the notification of the discovery of a relic under section 146 of the <i>Heritage Act 1977</i> to address a change in Heritage NSW's process.

## Appendix A: Examples of unexpected heritage finds

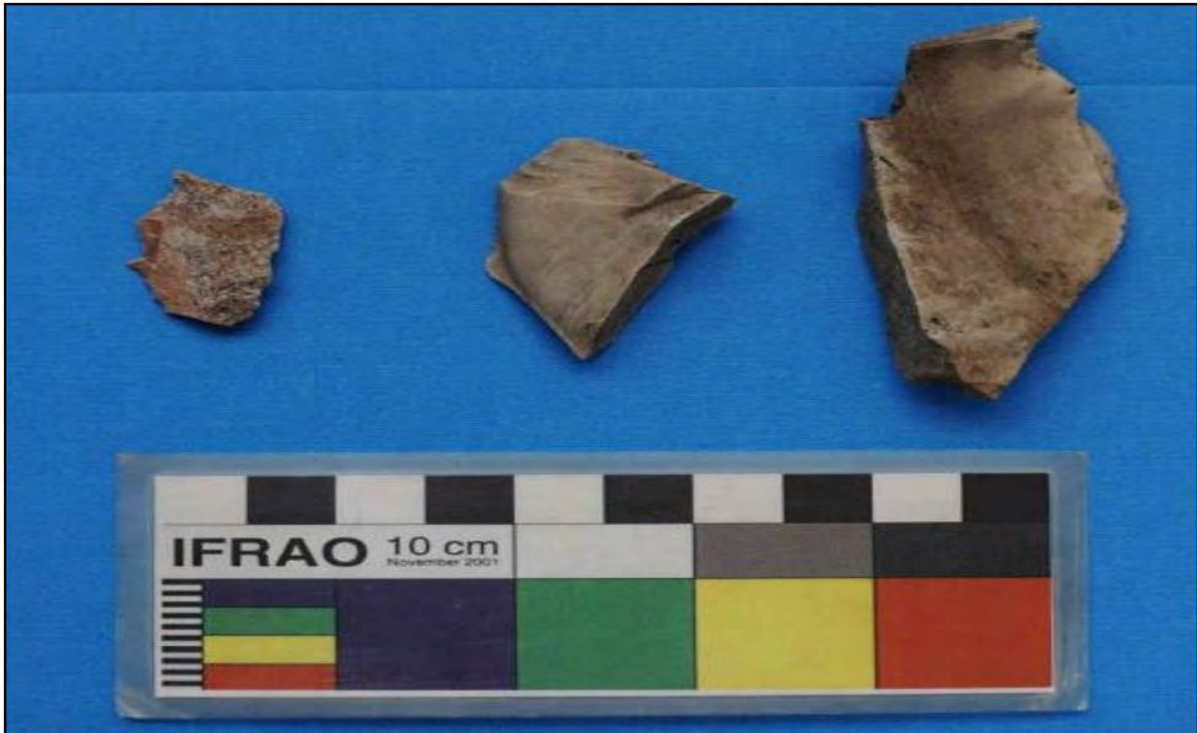


Figure 2: Aboriginal stone artefacts found at the Wickham Transport Interchange, 2015



Figure 3: Aboriginal artefacts (shell material) found at the Wickham Transport Interchange, 2015



Figure 4: 1840s seawall and 1880s retaining wall uncovered at Balmain East, 2016



Figure 5: Sandstone pavers uncovered at Balmain East, 2016



Figure 6: Platform at Hamilton Station classified as a 'work' by the project archaeologist, Wickham Transport Interchange project, 2015



Figure 7: Sandstone flagging and cesspit, Wynyard Walk project, 2014



Figure 8: Chinese Ming Dynasty pottery and English porcelain/pottery dating back to the early nineteenth century, Wynyard Walk project, 2014



Figure 9: Pottery made by convict potter Thomas Ball during the early settlement period, Wynyard Walk project, 2014



Figure 10: Top left hand picture continuing clockwise: Stock camp remnants (Hume Highway Bypass at Tarcutta); linear archaeological feature with post holes (Hume Highway Duplication), animal bones (Hume Highway Bypass at Woomargama); cut wooden stake; glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area)



Figure 11: Culturally modified stone discovered on Main Road 92, about two kilometres west of Sassafras. The remaining images shown a selection of stone artefacts retrieved from test and salvage archaeological excavations during the Hume Highway Duplication and Bypass projects from 2006-2010

## Appendix B: Unexpected heritage find recording form

Refer to [SM-21-00280658 Unexpected Heritage Find Recording Form](#).



## Appendix C: Photographing unexpected heritage items

Photographs of unexpected finds in their current context (*in situ*) may assist archaeologists/Aboriginal heritage consultants to better identify the heritage values of the item. Emailing good quality photographs to specialists can allow for better quality and faster heritage advice. The key elements that must be captured in photographs of the item include its position, the item itself and any distinguishing features. All photographs must have a scale (ruler, scale bar, mobile phone, coin etc.) and a note describing the direction of the photograph.

### C1: Context and detailed photographs

It is important to take a general photograph (below left) to convey the location and setting of the item. This will add value to the subsequent detailed photographs also required (below right – labelled Figure 2).

**Removal of the item from its context (e.g. excavating from the ground) for photographic purposes is not permitted.**

### C2: Photographing distinguishing features



**Figure 2:** Close up detail of the sandstone surface showing material type, formation and construction detail. This is essential for establishing date of the feature.

Where unexpected items have a distinguishing feature, close up detailed photographs must be taken of these features, where practicable. In the case of a building or bridge, this may include diagnostic details architectural or technical features. See images next page, labelled Figures 3 and 4 for examples.



Figure 3: Ceramic bottle artefact with stamp.



Figure 4: Detail of the stamp allows 'Tooth & Co Limited' to be made out. This is helpful to a specialist in gauging the artefact's origin, manufacturing date and likely significance.

### C3: Photographing bones

The majority of bones found on site will be animal bones often requiring no further assessment (unless they are in archaeological context). However, if bones are human, the police must be contacted immediately (see [Appendix E](#) for detailed guidance). Taking quality photographs of the bones can often resolve this issue quickly. The project archaeologist can confirm if bones are human or non-human if provided with appropriate photographs.

Ensure that photographs of bones are not concealed by foliage (example below left, labelled Figure 5) as this makes it difficult to identify. Minor hand removal of foliage can be undertaken as long as disturbance of the bone does not occur. Excavation of the ground to remove bone(s) should not occur, nor should they be pulled out of the ground if partially exposed.

Where sediment (adhering to a bone found on the ground surface) conceals portions of a bone (example below right, labelled Figure 6) ensure the photograph is taken of the bone (if any) that is not concealed by sediment.



Figure 5: Bone concealed by foliage.



Figure 6: Bone covered in sediment

Ensure that all close up photographs include the whole bone and then specific details of the bone (especially the ends of long bones, the *epiphysis*, which is critical for species identification). The images below (labelled Figure 7, left and Figure 8, right) are examples of good photographs of bones that can easily be identified from the photograph alone. They show sufficient detail of the complete bone and the epiphysis.



Figure 7: Photograph showing complete bone.



Figure 8: Close up of a long bone's epiphysis.

## Appendix D: Archaeological/heritage advice checklist

Refer to [SM-21-00280680 Archaeological Heritage Advice Checklist](#)





# Exhumation Management Procedure

SM-20-00099495 (formerly SM ES-PW-315)

Metro Body of Knowledge (MBoK)

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<b>Name of Approver:</b>	Carolyn Riley
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<b>Date Approved:</b>	24 April 2023
<b>Digital Signature:</b>	

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# 1. Introduction

Sydney Metro has developed this Exhumation Management Procedure (ExMP) to provide guidance for managing the discovery of human skeletal remains during the course of works. The procedure is applicable to both unexpected skeletal finds and controlled archaeological investigations where human remains are anticipated.

The procedure is applicable to all stages of any Sydney Metro project and to all staff and contractors.

Sydney Metro is Australia's biggest public transport project. By 2030, Sydney will have a network of four metro lines, 46 stations and 113km of new metro rail.

Sydney Metro is revolutionising how Australia's biggest city travels, connecting Sydney's north west, west, south west and greater west to fast, reliable turn-up-and-go metro services with fully accessible stations.

The metro program includes the operational Metro North West Line and three projects under construction:

- City & Southwest
- West
- Western Sydney Airport

The purpose of this ExMP is to provide a clear and concise process to follow in the event of the discovery of potential human remains during Sydney Metro activities.

This ExMP will be reviewed as required and prior to any future Sydney Metro project that has potential to impact on known burials, graves, cemeteries or burial grounds. A review may require amending the ExMP to tailor additional controls or management procedures that are specific to the impacted cemetery or burial ground. In addition, the requirements of the relevant Planning Approval will be assessed during the review of this ExMP prior to its implementation.

This ExMP should be read in conjunction with [SM-20-00099497 Unexpected Heritage Finds Procedure](#).



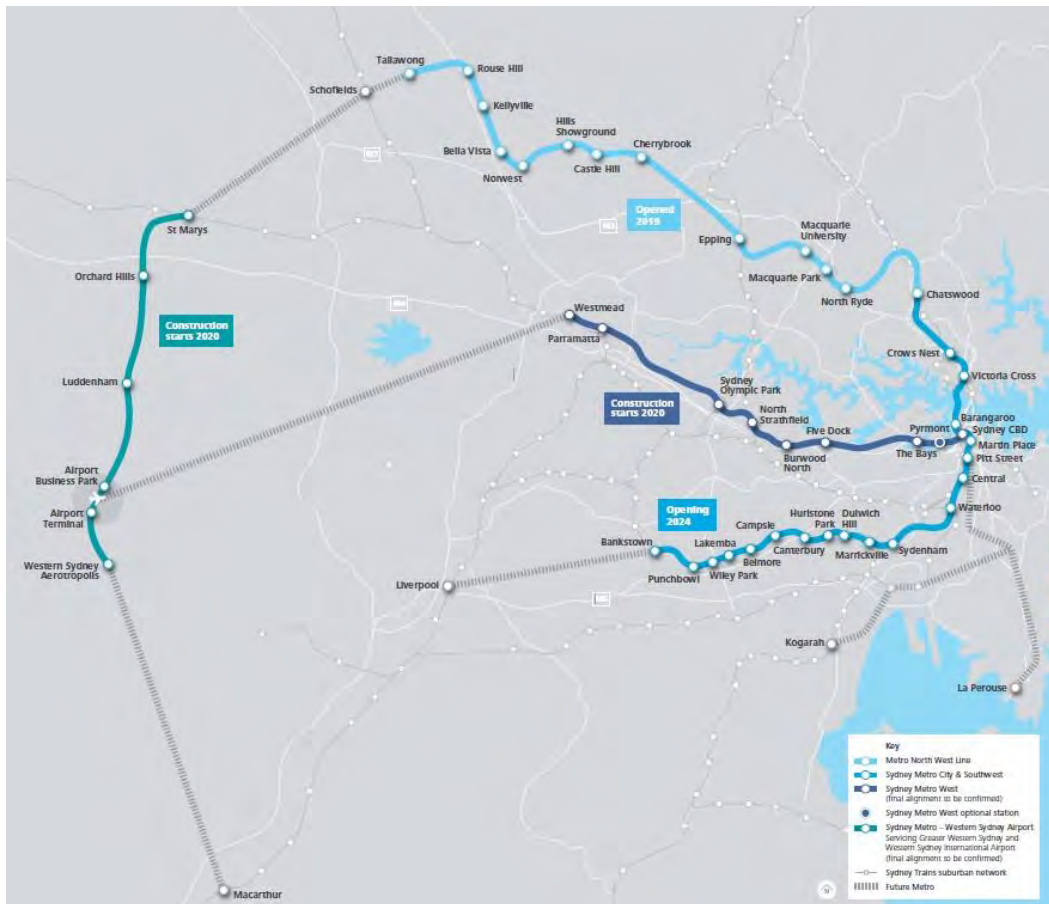


Figure 1: Sydney Metro overview and station locations

## 1.1. Purpose and scope

This ExMP outlines the procedure for the management of the discovery of human remains within the Sydney Metro program. It includes:

- Overview of legislative requirements for dealing with human remains (e.g. *Coroners Act 2009*, *Heritage Act 1977*, *Guidelines for the Management of Human Skeletal Remains 1988*, and the *Public Health Regulations 2022*).
- A flow chart process to be followed when human remains are uncovered.
- An archaeological methodology for the excavation of remains including processes for appropriately handling remains in accordance with the relevant guidelines (see section 2.3 and 2.4 below).
- Post-exhumation management processes including relocation, processing and long-term arrangements.
- Process for nomination of a physical anthropologist and temporary storage location.
- Process for additional analysis including DNA testing, isotope analysis and environmental sampling, and discussion on requirements for public involvement.

## 2. Overview of legislative requirements for dealing with human remains

The following section provides an overview of the legislation that would apply to the discovery, management and relocation of human remains. A discovery of suspected human remains may be subject to different Acts and requirements, thereby triggering different notification pathways based on the specific circumstances involved.

The first step will always be to notify the NSW Police. Confirmation of the age (antiquity) and nature of the skeletal remains as well as the reasons for the disturbance will dictate which Act and provisions will be applicable.

### 2.1. Discovery of human remains and forensic cases: *NSW Coroners Act 2009*

For a discovery of suspected human remains less than 100 years old, the remains would come under the jurisdiction of the State Coroner and the *NSW Coroners Act 2009*. Such a case would be considered a 'reportable death' and, under legal notification obligations set out in s35 (2); a person must report the death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old, regardless of ancestry (i.e. both Aboriginal and non-Aboriginal remains).

#### *35 Obligation to report death or suspected death*

- (1) *This section applies to any person who has reasonable grounds to believe that a death or suspected death of another person:*
  - (a) *is a reportable death or occurred in circumstances that would be examinable under Division 2 of Part 3.2, and*
  - (b) *has not been reported in accordance with subsection (2).*
- (2) *A person to whom this section applies must report the death or suspected death concerned to a police officer, a coroner or an assistant coroner as soon as possible after becoming aware of the grounds referred to in subsection (1).*

*Maximum penalty (subsection (2)): 10 penalty units.*
- (3) *A police officer to whom a death or suspected death is reported under this section is required to report the death or suspected death to a coroner or assistant coroner as soon as possible after the report is made.*
- (4) *An assistant coroner to whom a death or suspected death is reported under this section is required to report the death or suspected death to a coroner as soon as possible after the report is made.*
- (5) *A coroner to whom a death or suspected death is reported under this section is required to inform the State Coroner of the report as soon as practicable after the report is made.*

## 2.2. Historic human remains: *Heritage Act 1977 and Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977*

The *Heritage Act 1977* (Heritage Act) and *Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977*<sup>1</sup> (the Guidelines) apply to historic burials in New South Wales. It should be noted that the Guidelines are outdated in terms of the current statutory framework.

A relic is defined as an archaeological deposit or artefact that has heritage significance at a local or State level. The guidelines, *Assessing Significance for Historical Archaeological Sites and Relics*<sup>2</sup>, have been endorsed by the Heritage Council of NSW and should be used to assess the level of heritage or archaeological significance of the remains. With reference to burial grounds, objects such as headstones, grave enclosures and grave goods, as well as buried human remains, may be 'relics' under the Heritage Act.

Approval under the Heritage Act and the *National Parks and Wildlife Act 1974* (NPW Act) is not required if human remains are uncovered during a Critical State Significant Infrastructure (CSSI) project. However, notification to the Heritage Council under s146 of the Heritage Act, and notification of an Aboriginal object under the NPW Act is required if human remains are uncovered during archaeological or other project related investigations.

## 2.3. Aboriginal human remains: *National Parks and Wildlife Act 1974*

The NPW Act, administered by Heritage NSW, provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 84.

Discovery of Aboriginal burials and/or human remains would be addressed in the projects Aboriginal Cultural Heritage Assessment Report (ACHAR). ACHARs would be prepared in accordance with the following Heritage NSW guidelines:

- *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*<sup>3</sup>;
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*<sup>4</sup>;
- *Aboriginal cultural heritage consultation requirements for proponents 2010*<sup>5</sup>,
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*<sup>6</sup>.

If suspected human skeletal remains are uncovered at any time during the archaeological management program, the process outlined in this ExMP and detailed in the flow chart is to

<sup>1</sup> NSW Heritage Office, 1998.

<sup>2</sup> Heritage Branch of the Department of Planning, 2009.

<sup>3</sup> NSW Department of Environment and Conservation, 2005.

<sup>4</sup> Office of Environment and Heritage, 2011.

<sup>5</sup> Department of Environment, Climate Change and Water, 2010.

<sup>6</sup> Office of Environment and Heritage, 2010.

be followed. Management of the remains would be guided by consultation with the nominated Registered Aboriginal Parties (RAPs) for the project, in adherence to the ACHAR.

## 2.4. Exhumation of human remains: *Public Health Regulation 2022 (NSW)*

The *Public Health Regulation 2022* provides specific regulation for the exhumation of human remains in NSW.

Under Clause 95 of the Regulation, an application for approval to exhume the remains of a dead person may be made to the Secretary via an approved form to the Local Public Health Unit delegated to act on behalf of the Secretary.

Refer to Appendix 1 for a copy of the approved form.

## 2.5. *Work Health and Safety Act 2011*

The *Work Health and Safety Act 2011* provisions apply to protect personnel involved in the exhumation procedure by creating and maintaining safe and healthy work practices and are enforced by WorkCover NSW. Graves, crypts and vaults could be considered to be confined spaces in some circumstances under health and safety legislation. More information on safe work practices is available at or by contacting SafeWork NSW via their website or directly.

Health and safety aspects of working with human remains should be considered. Generally, working with archaeological human skeletal remains requires no extra precautions to be taken beyond normal health and safety regulations. Once any necessary site health and safety precautions have been taken, the exhumation of human remains can proceed.

# 3. Procedure for the discovery and management of human remains

This procedure provides project managers, principal contractors and the Project Excavation Director with advice on the steps to follow when suspected human remains are uncovered. Information on the potential for burials and human remains where known would be included in the general project induction for all personnel. The general project induction would also include the procedure to manage human remains set out in this ExMP.

## 3.1. Initial discovery of bones: What do we do?

To avoid doubt, all suspected bone items must be treated as potential human skeletal remains, and work in the immediate vicinity must stop while they are protected and investigated as a matter of urgency.

### 3.1.1. Stop Work and preliminary notification

If bone is uncovered, all work in the vicinity of the find must stop to allow for a positive identification as either human or non-human bone.

The Project Excavation Director must be notified.

Where required, preliminary notification must be made to the NSW Police in compliance with Section 35 of the *Coroners Act 2009* (also refer to special conditions for Central Station noted in section 4).

<b>What?</b>	When bones are uncovered at a site, all work in the area of the find must <b>stop immediately</b> and the site must be secured.
<b>Who?</b>	The discoverer will <b>immediately</b> notify machinery operators so that no further disturbance of the remains will occur, as well as notifying the foreman/site supervisor, principal contractor, project archaeologist/Excavation Director and Sydney Metro Environmental Manager. Where required, preliminary notification to the NSW Police will be undertaken by the Sydney Metro Environment Manager in consultation with the Sydney Metro Senior Heritage Advisor and Excavation Director. Notification should provide verbal description of the remains and inform the police that consultation with technical specialists is being undertaken to confirm that the remains are human, as well as the burial context (archaeological or less than 100 years old, refer Step 2).
<b>How?</b>	Inform all site personnel of restricted access to the area of the discovery and no work to proceed until further notice. Area must be fenced off (flagging or temporary exclusion fencing).
<b>Actions</b>	Notify site supervisor, principal contractor, project archaeologist/Excavation Director and Sydney Metro Environmental Manger and Senior Heritage Advisor of the find and protect the suspected remains until an initial assessment can be undertaken by a technical specialist. Preliminary notification to NSW Police by Sydney Metro Environmental Manager.

### 3.1.2. Confirm the remains are human

Skeletal remains could either be articulated and in a recognisable form of burial such as a coffin or common burial position of the body (e.g. supine, prone or flexed), or they could be disarticulated or fragmented remains. Within the boundaries of a known historic burial ground, there is a high probability of the remains being human. In a suspected forensic case (less than 100 years old), the remains may have clothing and/or human tissue. Disarticulated or fragmented bones are often uncovered, and these may require specialist assessment to determine legal jurisdiction.

If suspected human remains are identified during the project, preliminary notification must be made to the NSW Police in compliance with Section 35 of the *Coroners Act 1999* (refer Step 1). NSW Police would be contacted immediately upon receipt of confirmation of human provenance.

<b>What?</b>	Confirmation that the remains are human, their burial context - whether they are forensic (less than 100 years) or archaeological (older than 100 years) and suspected ancestry (Aboriginal or non-Aboriginal).
<b>Who?</b>	Excavation Director and or Forensic or physical anthropologist, or archaeologist with specialist skills such as an osteoarchaeologist. Notification to the NSW Police will be undertaken by the Sydney Metro Environmental Manager.
<b>How?</b>	Consultation could be undertaken as either an on-site inspection or via good quality photos sent to the nominated technical specialist of 1) the remains; and 2) the site general site location of the discovery.

<b>Actions</b>	<p>Contact nominated technical specialists to confirm that the remains are: a) human, b) burial context (archaeological or forensic), and c) suspected ancestry (Aboriginal or non-Aboriginal).</p> <p>For the duration of the Sydney Metro project, the nominated technical specialists are:</p> <ul style="list-style-type: none"> <li>• Forensic Anthropologist – TBC by contractor for project area.</li> <li>• Nominated Excavation Director – TBC by contractor for project area.</li> <li>• Sydney Metro Environmental Manager to conduct and or oversee liaison with NSW Police.</li> </ul> <p>The archaeologist may be able to identify the nature of remains without input from the Forensic Anthropologist. The Forensic Anthropologist should be contacted as required.</p>
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### 3.1.3. Notification based on jurisdiction (forensic or archaeological)

Once confirmation is received from the technical specialist that the remains are of human origin, there are three possible statutory pathways to follow based on the assessment.

<b>What?</b>	Forensic case: remains are less than 100 years old
<b>Who?</b>	If it is determined by specialist assessment (Step 2) that the remains are forensic, the remains come under the jurisdiction of the State Coroner and the Coroners Act 2009.
<b>How?</b>	The NSW Police would likely secure the site and will advise on the procedure to be followed.
<b>Actions</b>	Environmental Manager to liaise with NSW Police

<b>What?</b>	Archaeological – non-Aboriginal human remains – more than 100 years old.
<b>Who?</b>	Follow the Archaeology Exhumation Methodology as set out in Step 4 below
<b>How?</b>	Follow the Archaeology Exhumation Methodology as set out in Step 4 below
<b>Actions</b>	Follow the Archaeology Exhumation Methodology as set out in Step 4 below

<b>What?</b>	Archaeological – suspected Aboriginal human remains – more than 100 years old.
<b>Who?</b>	Recording of Aboriginal ancestral remains must be undertaken by, or conducted under the direct supervision of a specialist with registered Aboriginal parties (RAPs) present.
<b>How?</b>	The RAPs must be present where it is reasonably suspected that Aboriginal burials or human remains have been encountered.
<b>Actions</b>	Notify RAPs and Heritage NSW and follow the Aboriginal cultural heritage assessment report (ACHAR). Follow the Archaeology Exhumation Methodology as set out in Step 4.

## 3.2. Archaeological exhumation methodology

The following section provides a broadly accepted archaeological methodology for exhumation and the appropriate handling of human remains.

### 3.2.1. Securing the site

The strategy for the excavation and removal of human remains must be sensitive to public opinion and ethics and exhumation activities should not be visible to the general public. The site may need to be screened off from public areas, not only with hoarding but also in some cases with a roof to screen the site off from overlooking buildings. At all times, human remains should be treated respectfully. The perimeter of the excavation site should be demarcated by

plastic tape or flagging, with only technical staff allowed within this area for the duration of exhumation activities.

The site should be protected from the elements including flooding, contamination with dust or debris, and other disturbance. These measures would be formulated by the Excavation Director in consultation with the contractor and Sydney Metro where required and may differ from site to site.

### 3.2.2. Excavation Director

Archaeological investigations are to be managed by a suitably qualified Excavation Director with experience in the excavation and management of human remains. For sites with potential for locally significant remains, the Excavation Director should meet the NSW Heritage Council criteria for experience with locally significant archaeological sites. For sites with potential for State significant archaeology the Excavation Director should meet the Heritage Council of NSW criteria for experience with State significant archaeological sites.

### 3.2.3. Excavation and recording

Exhumation and recording are to be undertaken in accordance with best practice forensic and Heritage Council of NSW guidelines. Prior to removal, the remains should be fully recorded in situ to understand their surrounding archaeological context. This will include recording any disturbances to the burial and the identification of bones present. In some cases, the deposit of bones may be a mixture of articulated and disarticulated remains. Care should be taken to distinguish articulated remains and to assess if they represent commingled individuals or disturbed remains belonging to one individual, and to record them accordingly.

### 3.2.4. Recording

- A standard context recording system is to be employed.
- Detailed survey and/or measured drawings are to be prepared and include location of remains within the overall site (position of the body, the direction of the burial, noting any stratigraphic relationships with other archaeological features).
- Any associated artefacts (potential grave goods, burial furniture) are to be recorded and collected by context for later analysis.
- Photographic record of all phases of work in accordance with 'Photographic Recording of Heritage Items Using Film and Digital Capture'. Photographs are to be in RAW format, using photographic scales and photo boards where appropriate.
- Registers of contexts, photos, samples and drawings are to be kept.

### 3.2.5. Excavation

- Detection of the extent of the grave/remains (if disarticulated).
- Surface soils removed in excavation units of 100mm (site dependent) using small hand tools.
- Expose remains with soft paint brushes and pedestal the remains.

- Record position and depth of remains.
- Soil removed is to be sieved through 3mm mesh to examine for teeth and bone fragments.

Soil samples may be taken from the abdominal and/or chest areas of the body (articulated remains) to retrieve further evidence.

- Exhumation must be under the control of the Excavation Director, with the assistance of a Forensic Anthropologist if required. Exhumation permit/s, provided by NSW Ministry of Health may also require the presence of an authorised officer or a member of staff of the Ministry of Health.
- Further excavation of the bottom of the pit (grave) following removal to confirm the absence of further remains.

### 3.2.6. Relocation of bones

Removal and collection of skeletal remains is to follow the standard forensic practice of labelling as follows:

- Remove remains from the ground systematically and place in plastic bags according to anatomical areas of the body.
- Bags should not be air-tight and should have ventilation holes to prevent deterioration of fragile skeletal material. Each bag should contain labels and the separate bags should then be placed in a large plastic bag, crate or box, labelled with the context information.
- The remains should be placed in a sturdy, large cardboard box (approximately 600 x 300 x 200 mm) for relocation to off-site processing location.

### 3.3. Resume work

Construction work may only recommence upon receipt of clearance certificate from the Excavation Director and may require additional NSW Ministry of Health approval. If a forensic case, written authorisation from the NSW Police is required.

### 3.4. Reporting

A report would be prepared following the completion of the program of exhumation works, separate to the archaeological excavation report for the project. This report would include skeletal analysis catalogue, comprehensively describe the process of exhumation, detail the recording of the remains and synthesise the results of any further laboratory testing. An assessment of significance for the remains would be provided and interpreted within the context of the archaeological research design (response to research questions).



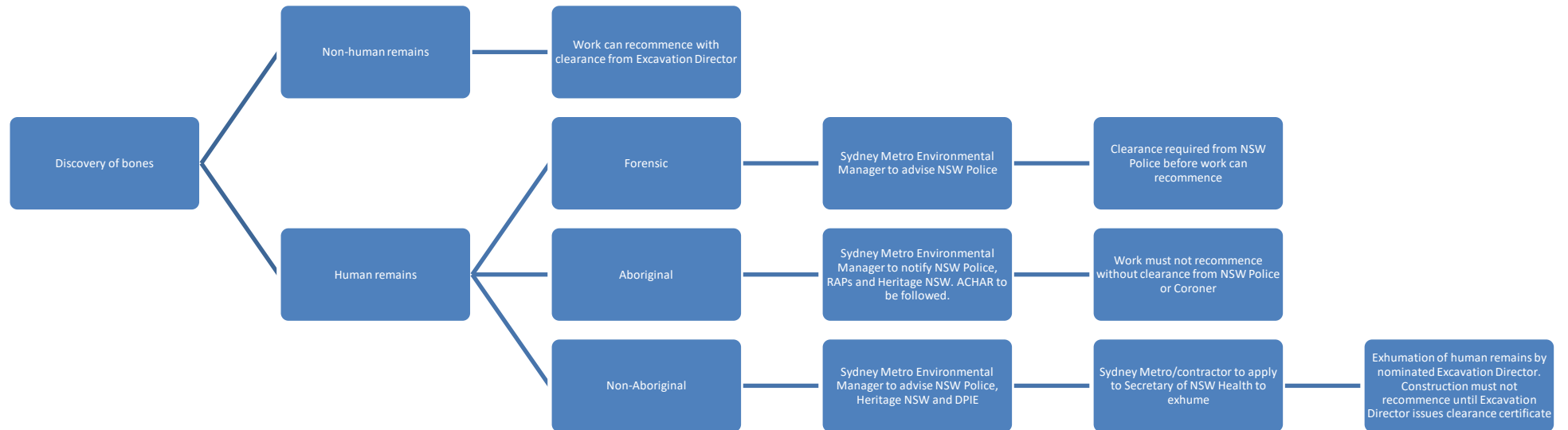


Figure 2: Exhumation procedure flow chart

## 4. Excavation and post-excavation tasks

All on-site management should be in accordance with the archaeological research design (ARD) and relevant archaeological method statement (AMS), and be overseen by the Excavation Director. The Excavation Director would nominate a Forensic Anthropologist where required.

### 4.1. Research questions

Research questions should be specific to the site and the site history. The research questions in the archaeological research design can be revised as new information emerges and new research questions can be investigated.

The following general research questions can be used to guide exhumations, should intact burials, disarticulated remain, burial cuttings or associated material culture be uncovered during work.

#### 4.1.1. Social history and burial practices

- Does the location of the burial/burial cutting correspond with historic plans/descriptions?
- Is there evidence of exhumation?
- Do graves cut into older ones? What can this tell us about nineteenth century burial practices, and how does this compare to other excavated cemetery sites in the region?
- What is the distance between burials (if multiple burials uncovered)? Does this conform to known nineteenth century burial practices?
- What type of fill was used within grave cuttings? What can this tell us about the surrounding environment and burial practices at the time?
- What materials/tree species were used in the coffin manufacture? Can coffin manufacturing techniques or fastening methods (use of mortar, screws, nails, tacks) be identified? Does this match known burial practices of the time? If alternative methods are identified, what can this tell us about the manufacturer or economic/social landscape?
- Can the class or rank of the individual be identified via coffin materials, grave goods or clothing/shrouds?
- Which direction is the burial orientated? How does this correspond with the known/hypothesised location of denomination areas?
- If the burial is associated with more than one individual, can a familial relationship be assessed through DNA or other genetic markers identifiable within the skeletal remains?

### 4.1.2. Environmental factors and scientific analysis

- What is the condition of the bones? How does their condition compare to known or nearby burials of the same age? What environmental or human factors may have influenced the decomposition process?
- Can the health, nutrition, sex, race, stature or age be identified through the skeletal remains? Is there evidence of trauma on the bones? Is there evidence of pathology on the bones (e.g. syphilis, tuberculosis, tumours)?
- Can stable isotope analysis address any questions regarding diet, country of origin and nutrition?
- Can DNA testing address any questions not answerable by the skeletal remains themselves, such as sex, familial relationships (if buried with another individual/s) or race?
- Is there potential for DNA to be tested against any individuals who may come forward as a descendant of the deceased?

## 4.2. Process for DNA testing, isotope analysis and environmental sampling

### 4.2.1. Pre-excavation

The Excavation Director, in consultation with the Forensic Anthropologist, will nominate a suitable laboratory prior to works commencing. Requirements for DNA testing, isotope analysis and environmental sampling will be identified in the archaeological research design and archaeological method statement.

### 4.2.2. Excavation

To prevent cross-contamination, the following sample collection and excavation process should be followed:

- The location, quantity and material (bone, teeth, hair, soil, wood) of samples will be determined by the Excavation Director or Forensic Anthropologist prior to its collection.
- Samples would be stored in a safe, secure and climate controlled location while excavations are in progress. This would be chosen by the Excavation Director or Forensic Anthropologist on site.
- Each collected sample would be given a unique catalogue number and a sample register would be recorded throughout the excavation.

- ‘Clean excavation’ procedures would be followed during the excavation of burials and during the sample collection process<sup>7</sup>. This would include:
  - Latex gloves would be worn by individuals excavating and/or handling bone or soil samples. Gloves would be changed for each bone and/or individual to prevent cross-contamination;
  - Excavation tools/brushes would be cleaned prior to and after the collection of each sample to prevent cross-contamination;
  - In some cases, a face mask would be worn when samples for DNA analysis are being collected;
  - Bone samples for DNA testing would be collected with surrounding in situ soil and should not be cleaned prior to bagging;
  - It may be necessary for individuals involved in sample collection to submit DNA for comparison in the event of cross-contamination; and
  - All bags containing samples for analysis would be bagged and labelled appropriately to prevent cross contamination and ensure they are handled and stored correctly.

### 4.2.3. Post-Excavation

On completion of excavations, samples will be transported to nominated laboratories for analysis. A record of their location will be kept.

## 4.3. Reporting

The results of the investigation of human remains and the exhumation will be included in the archaeological reporting for the project in accordance with the project ARD.

Once finalised, and where it is appropriate to do so as determined in consultation with RAPs and/or as may be required by the relevant planning approval obligations, archaeological and associated specialist reports should be submitted to:

- The relevant local council and library;
- Heritage NSW library;
- The State Library of NSW; and
- Made available online for public access and educational purposes.

Further, if significant remains are identified during excavations, the results and findings would be published in academic journals and conference papers where feasible.

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<sup>7</sup> Guidelines for ‘clean excavation’ are based on procedures outlined in: Yang, D. Y. & Watt, K. 2005. Contamination controls when preparing archaeological remains for ancient DNA analysis. *Journal of Archaeological Science*, vol. 32, pp. 331–336 and *Society for Historical Archaeology*, 2015–2017. Research and Analysis of Artefacts. Accessed online at: <https://sha.org/conservation-facts/faq/analysis/#C> on 25/5/2017.

## 4.4. Public involvement

Archaeological excavations may uncover remains directly associated with early settlement and burial practices. Such remains are likely to generate public interest.

Public involvement may include:

- Seeking descendants of identified individuals to consult on appropriate actions and reburial proposals
- Media releases;
- Public Open Days;
- Preparation of brochures detailing the archaeological excavations;
- Interpretive signage and online blog posts or site diaries while excavations are taking place; and
- The preparation of a Heritage Interpretation Plan designed to provide interpretation of the site within the new development upon the completion of works.

Due to sensitive nature of human skeletal remains, these recommendations would be adapted and modified as appropriate under the direction of Sydney Metro and the Excavation Director.

Such recommendations would also be considered and require approval from relevant stakeholder groups such as known or potential descendants of the deceased, Heritage NSW/Heritage Council of NSW, local Council and interest groups.

## 4.5. Temporary storage and permanent repository or resting place for remains

### 4.5.1. Temporary storage

Upon the completion of archaeological excavations, skeletal remains should be boxed separately and temporarily stored within a safe, secure controlled environment to allow for further analysis of the remains. This location would be chosen by the Excavation Director and the Forensic Anthropologist and would comply with NSW legislative requirements.

### 4.5.2. Permanent repository or resting place for remains

A permanent repository or resting place for remains is dependent on the nature and volume of skeletal remains. Final arrangements would be dictated by Sydney Metro, the Excavation Director, Forensic Anthropologist, identified descendants of the deceased, RAPs (if applicable) and/or other stakeholders upon the completion of excavations and subsequent analysis.

## 5. Definitions

All terminology in this Procedure is taken to mean the generally accepted or dictionary definition. Acronyms and terms specific to this document are listed below.

Other terms and jargon are defined within the [SM-17-00000203 Sydney Metro Glossary](#).

	Definitions
<b>IMS</b>	Integrated Management System (IMS)
<b>TfNSW</b>	Transport for New South Wales
<b>RAP</b>	Registered Aboriginal party
<b>ACHAR</b>	Aboriginal cultural heritage assessment report
<b>ARD</b>	Archaeological research design
<b>AMS</b>	Archaeological method statement
<b>OEH</b>	Office of Environment and Heritage (now Heritage NSW)
<b>PHU</b>	Public Health Unit
<b>ExMP</b>	Exhumation Management Procedure (this Procedure)
<b>ER</b>	Environmental Representative (independent)

## 6. Accountabilities

The Executive Director, Environment, Sustainability & Planning is accountable for this Procedure including approving the document and monitoring its effectiveness. The Senior Advisor Heritage is responsible for overseeing the implementation of this Procedure, and performing a formal review of the document.

Direct Reports to the Chief Executive are accountable for ensuring the requirements of this Procedure are implemented within their area of responsibility.

Direct Reports to the Chief Executive who are accountable for specific projects/programs are accountable for ensuring associated contractors comply with the requirements of this Procedure.

## 7. Related documents and references

### Related documents and references

- [SM-20-00099497 Unexpected Heritage Finds Procedure](#)
- [NSW Health Application to Exhume Human Remains](#)
- Department of Environment, Climate Change and Water 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
- Department of Environment, Climate Change and Water 2010, Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW

## 8. Superseded documents

### Superseded documents

There are no documents superseded as a result of this document.

## 9. Document history

Version	Date of approval	Notes
1.1	May 2017	New IMS document.
2.0	July 2017	Incorporates Stage 2 (section 3)
2.1	February 2019	Extended for Metro Program wide application, includes changes specific Central Station management, and incorporates comments received from the State Coroner's Office, NSW Police, NSW Health, and Sydney Metro Environmental, Environmental Representatives engaged on the Central site and the Office of Environment and Heritage (OEH).
2.2	February 2019	Incorporates comments received from Artefact Heritage and Dr Denise Donlon issued to Health and OEH Heritage Division for consultation.
3.0	May 2019	Incorporates Health, Coroner and OEH comments.
4.0	April 2020	Updates to remove specific references to City and South West and Central Station. Change of title to "Procedure". Update to references.
5.0	16 August 2021	Updates to related documents and references.
6.0	December 2022	Minor clarifications to the procedure.


# Appendix A: NSW Health Application Form to Exhume Human Remains

For a copy of the form see [NSW Health Application to Exhume Remains](#).

NSW Health Form

## Application to Exhume Remains

Public Health Regulation, 2022 Section 95



In accordance with the requirements of Section 95(2) of the Public Health Regulation 2022,

I, \_\_\_\_\_  
*(Full name of applicant)*

of \_\_\_\_\_  
*(Address)* hereby

apply for permission to exhume the remains of the late \_\_\_\_\_  
*(Name of deceased)*

from Grave No: \_\_\_\_\_, Section \_\_\_\_\_, being a single interment within the \_\_\_\_\_ Cemetery, for the purpose of \_\_\_\_\_

I seek permission to exhume for the following reason/s:

The deceased:

was not known to be infected with a prescribed infectious disease as defined in Section 79 of the Public Health Regulation 2022; **OR**

was known to be infected with a prescribed infectious disease as defined in Section 79 of the Public Health Regulation 2022

I am entitled to make this application because I am: (tick one)

The executor of the estate of the deceased; **OR**

The nearest surviving relative of the deceased; **OR**

If there is no executor or relative available to make the application, a proper person can make the application for the reasons set out below:

*(Full reasons for proper person to make application)*

1/2



NSW Health **Application to Exhume Remains** Form  
Public Health Regulation 2022 Section 95

Attached are:

- A certified copy of the death certificate of the deceased issued under the Births Deaths and Marriages Registration Act 1995.
- A statutory declaration as to:
  - My relationship to the deceased; and
  - the wishes of the deceased regarding the disposal of the body (if known);
  - the reasons why the Secretary may consider me the proper person in all circumstances to make the application (if applicable)
- The application fee of \$ \_\_\_\_\_

**The exhumation is to be supervised in strict accordance with the attached Plan of Management**

by \_\_\_\_\_

employed with \_\_\_\_\_  
*(Funeral Director/Cemetery)*

in the capacity of \_\_\_\_\_

Signature of applicant: \_\_\_\_\_

Date: \_\_\_\_\_