



Mirvac Projects
During Construction
Remediation Environmental Management Plan
for the
Locomotive Workshop

Australian Technology Park, Eveleigh, NSW

26 March 2019

51142/121294

JBS&G Australia Pty Ltd

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1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Mirvac Projects Pty Ltd (Mircac, the client) to prepare a Remediation Environmental Management Plan (REMP) for the refurbishment/development of the Locomotive Workshops located at 2 Locomotive Street, Eveleigh, NSW (the site). The site location and layout are shown on **Figures 1** and **2** respectively.

The site is legally identified as Lot 4000 and Part Lot 4007 in Deposited Plan (DP) 1194309 and occupies an area of approximately 2.7 hectares (ha).

Site development activities will largely involve augmentations to the existing heritage building (i.e. removal of 21 century alterations and interior refurbishment leaving the existing concrete hardstands and building exterior), new foundation piles in areas, and construction of an underground pedestrian tunnel between the site and Building 2 (Lot 12) situated to the south of Locomotive Street.

To achieve the objectives outlined below (**Section 1.2**), this REMP includes a description of works, the identification of relevant and applicable legislation and regulatory requirements, description of potential environmental impacts of the project and associated management measures.

1.2 Objectives and Regulatory Requirements

The objectives of this document are to satisfy all relevant consent conditions pertaining to the requirement for a REMP for the construction works. A description of these requirements and applicable regulatory guidance are provided in **Section 2**.

2. Legislative Framework

2.1 Consent Condition B35 of SSDA 8517 and B29 of SSDA 8449 – Remediation Environmental Management Plan

Condition B35 of the State Significant Development Application (SSDA) 8517 and B29 of SSDA 8449 relevant to the proposed development works state *“Prior to the issue of the relevant Construction Certificate, a Remediation Environmental Management Plan (REMP) prepared by a suitably qualified person must be submitted to and approved by the PCA. The plan shall be prepared for each development stage to ensure the works and management are specific to each developable area and must:*

(a) outline the environmental monitoring and management measures to be implemented during the remediation and construction works on the site;

(b) be consistent with and adopt all recommendations of the Remedial Action Plan prepared by JBS&G dated 15 June 2016 and reflect the requirements of Clause 17 and Clause 18 of SEPP 55; and

(c) provide contingency measures to manage unexpected finds of contaminated materials, beyond that anticipated at the site”.

2.2 SEPP 55 Clause 17 and 18 Requirements

SEPP 55 Clause 17 and 18 state the following:

SEPP 55 Clause 17

“(1) All remediation work must, in addition to complying with any requirement under the Act or any other law, be carried out in accordance with:

(a) the contaminated land planning guidelines, and

(b) the guidelines (if any) in force under the Contaminated Land Management Act 1997, and

(c) in the case of a category 1 remediation work - a plan of remediation, as approved by the consent authority, prepared in accordance with the contaminated land planning guidelines.

(2) A notice of completion of a category 1 remediation work on any land must be given to the council for the local government area in which the land is situated (or, if the land is within the unincorporated area, to the Western Lands Commissioner).

(3) The notice is to be given within 30 days after the completion of the work.

(4) A copy of the notice must also be given within the same period to the consent authority. If consent was required for the remediation work and the consent authority is not one of the authorities referred to in subclause (2)”.

SEPP 55 Clause 18

“The notice required by clause 17 (2) must:

(a) be in writing prepared and signed by the person who carried out the work, and

(b) provide the person's name, address and business telephone number, and

(c) provide details of the person's qualifications to carry out the work, and

(d) specify, by reference to its property description and street address (if any), the land on which the work was carried out, and

(e) provide a map of the location of the land, and

(f) state when the work was completed, and

(g) specify the uses of the land, and the substances, that contaminated it in such a way as to present a risk of harm to human health or some other aspect of the environment, and

(h) specify the uses of the land immediately before the work started, and

(i) briefly describe the method of remediation used in the work. and

(j) specify the guidelines that were complied with in the work, and

(k) specify the standard of remediation achieved (in the light of the use proposed for the land), and

(l) show in what manner the work (if a category 1 remediation work) complied with the conditions of the relevant development consent, and

(m) state what action must be maintained in relation to the land after the completion of the remediation work if the standard of remediation achieved is to be maintained.

Note: A site audit statement (within the meaning of Part 4 of the Contaminated Land Management Act 1997) may be given in partial compliance with this requirement”.

2.3 Regulatory Requirements

Future activities on site are required to be completed in accordance with several sections of environmental and occupational health and safety legislation and associated regulations. The primary Acts, Regulations and Guidelines are listed below with a brief summary of their applicability. Please note that this list is not intended to be a comprehensive listing of acts and regulations. The site owner and contractors are required to satisfy themselves that all applicable permits, licences and legislation have been obtained and their conditions satisfied.

Work Health and Safety Act, 2011

The overarching Act for NSW setting law relating to employee health and safety and employer responsibilities.

Occupational Health and Safety Regulation, 2017

Sets Regulations and details the duties for employers to achieve required employee health and safety performance.

Contaminated Land Management Act 1997 (CLM Act)

The *Contaminated Lands Management Act 1997* (CLM Act) controls the assessment of contamination and requirement of remediation of soils and groundwater. The act also contains guidance for the determination of whether a site presents a significant risk of harm and allows for accreditation of Site Auditors.

Waste Avoidance and Resource Recovery Act 2001 (WARR Act)

The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) replaced the *Waste Minimisation and Management Act 1995* and controls waste generation and waste reduction.

State Environmental Planning Policy (SEPP) 55 ‘Remediation of Land’

SEPP 55 relates to the decision-making process in undertaking remediation of land and making planning decisions in regard to contaminated and potentially contaminated land. Specific relevant clauses have been identified above.

National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) (NEPC 2013)

National guidelines for the assessment of land contamination endorsed by NSW EPA. These guidelines include recommended soil and groundwater assessment criteria for a variety of land uses.

Waste Classification Guidelines (EPA 2014)

All wastes generated and proposed to be disposed off-site shall be assessed, classified and managed in accordance with this guideline. Where wastes require immobilisation prior to off-site disposal an immobilisation approval shall be sought in accordance with Part 2 of this guideline.

POEO Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is the key piece of environment protection legislation administered by the EPA.

City of Sydney Development Control Plan 2012

The Council Development Control Plan (DCP) provides a number of environmental and site management provisions required to be employed during remediation works. These standards have been incorporated into the remedial action plan (RAP) prepared for the site and this REMP. These provisions were adopted as minimum standards for the site environmental management of remediation works.

Remedial Action Plan (JBS&G 2016¹)

This document details the remedial requirements required to make the site suitable. Additional details are presented in **Section 3.4**.

¹ *Mirvac Projects Pty Ltd Australian Technology Park Remedial Action Plan – 2 Locomotive Street, Eveleigh, NSW. JBS&G Australia Pty Ltd dated 15 June 2016 reference 51142/104280 Revision 0 (JBS&G 2016)*

3. Site Description

3.1 Site Identification

This site is a part of the Australian Technology Park (ATP) campus style precinct catering for science and technology-based occupants, in a historical setting, comprising heritage renewal as well as modern state of the art facilities. The site is located approximately 5 km south of the Sydney central business district (CBD), 8 km north of Sydney airport and within 200 m of Redfern Railway Station. The site, with an overall area of some 11.6 hectares, is located within the City of Sydney LGA.

The ATP, for which the site is part, is bound to the north by a railway easement, east by Garden and Cornwallis Streets, south by Henderson Road and to west by Alexander Street and a childcare facility.

The location of the site is shown in **Figure 1**, current layout is shown in **Figure 2**. Site details are summarised in **Table 2.1**.

Table 2.1 Summary Site Details

Site Lot and DP	Lot 4000 (previously Lot 13 DP 1136859) and Part Lot 4007 DP 1194309
Street Address	Australian Technology Park, 2 Locomotive Street, Eveleigh, NSW, 2015
ATP Site Area	Approximately 11.6 ha
Site Area	Approximately 2.7 ha
Local Government Authority	City of Sydney
Geographic Coordinates (MGA 56)	Please refer to Figure 2
Zoning	SEPP Major Development 2005 under the City of Sydney Local Environment Plan 2012
Previous Land Uses	Locomotive workshops, foundries, railway sidings and goods yards
Current Land Uses	Commercial land use (education, blacksmith, retail and commercial office space)
Proposed Developable Land Uses	Adaptive reuse for ongoing commercial land uses incl. education

3.2 Site Condition and Development Details

The Locomotive Workshop (the site) consists of a large building divided into 16 bays running north-south. Each bay was originally used for one or more trades required to repair or manufacture locomotives and their components. The building is of masonry construction with a metal roof and presents as a two-storey structure. A series of small annexes have been built along the southern side of the building fronting Locomotive Street.

Internally, the building is supported on a steel frame and metal roof trusses, which have been incorporated within the redevelopment of the building. Only Bays 1 & 2 at the east end of the building are substantially original, with the remaining bays having been converted to commercial office space, function and exhibition areas in a variety of styles. Items of machinery have been placed on display and interpreted throughout Bays 3 to 16 of the building.

Site development activities will largely involve internal remodelling rather than demolition of heritage structures. Advancement of foundations piles are proposed to support additional steel frame and metal roof trusses. The development application also provides for the construction of a pedestrian easement including a below ground traveller tunnel (concrete prefabricated slabs) extending from the lower basement of Building 2 to the south of the site, beneath the road reserve of Locomotive Street and into Bay 4 of the Locomotive Workshop within the site, as shown on **Figures 2 and 3**.

Based on the proposed scope of development works it is expected that only minor amounts of fill/soil will be generated surplus to development requirements that will require offsite disposal to a facility lawfully able to accept the material. In addition, it is anticipated that small quantities of growing media and/or structural soils will be required to be imported to the site.

During such works, appropriate controls and management measures are required to be implemented to ensure site works, visitors and/or users are not exposed to contaminants that may represent a potential health risk.

Following remedial and development works, existing (and newly constructed) hardstand pavements will serve as a physical barrier to contaminated soil at depth (**Section 3.3**).

3.3 Contamination Status and Summary of the Remedial Strategy

The following sections provide key comments in relation to the site's contamination status.

3.3.1 Soil

Available site characterisation data has identified that samples of fill material have, in some instances, concentrations of heavy metals, semi to non-volatile total petroleum hydrocarbons/total recoverable hydrocarbons (TPHs/TRHs), polycyclic aromatic hydrocarbons (PAHs, including concentrations of carcinogenic PAH compounds as benzo(a)pyrene Toxic Equivalence Quotient (TEQ)), volatile organic compounds (VOCs), in exceedance of ecological-based assessment criteria, and at relatively few locations, adopted health-based criteria as relevant to the future permissible land uses (commercial land use). Asbestos in soil has also been identified in some areas at concentrations above the adopted health-based criteria for commercial use.

For the purpose of this REMP, it is assumed all fill underlying the site is asbestos impacted until deemed otherwise via additional sampling and analysis by the appointed Environmental Consultant (JBS&G).

Exposure to these contaminants can be via absorption through the skin, ingestion, and inhalation via dust and/or vapours (for volatile compounds) where such pathways are complete.

3.3.2 Soil Vapour

Based on the results of previous investigations, inhalation of vapours is not a primary exposure with regards to the site suitability (commercial land use) provided existing surface treatments are maintained (or reinstated were site augmentation/development works are required to temporarily breach the pavements).

Notwithstanding, previous assessment activities have identified localised soil vapour impacts underlying the Locomotive Workshops (the subject site) that require monitoring from an occupational hygiene/workers health perspective during development. Specifically, elevated concentrations of trichloroethene (TCE) and tetrachloroethene (PCE) were identified underlying bays 5-7 and 14 of the Locomotive Workshop, as shown on **Figure 2**.

Although it is considered unlikely that vapour inhalation risks to subsurface workers are unacceptable, as a conservative measure it is required that ongoing management of the site includes provision to conduct air monitoring using a Photo-Ionisation Detector (PID) during excavations and the establishment of a 0.1ppm trigger level (based on sub-chronic risk, to be adjusted for PID lamp) for action (e.g. cease work, active ventilation) in order to appropriately manage risks to human health when working in these areas.

Exposure to these contaminants can be via vapours (for volatile compounds) where such pathways are complete.

3.3.3 Groundwater

Groundwater has been identified to contain elevated heavy metal, PAH and TRH concentrations when compared to recreational and/or drinking water guidelines. Groundwater quality is considered representative of urban groundwater quality and does not require remediation with respect to land use suitability. However, construction worker exposure to groundwater seepage if encountered during development, should be managed.

Previous investigations have encountered perched groundwater at depths ranging between approximately 19.4 to 17.5m Australian Height Datum (AHD) (2.5 to 4.4m below ground surface (bgs)), with groundwater seepage noted at approximately 12.4m AHD (9.5m bgs).

Exposure to these contaminants can be via absorption through the skin, ingestion and/or inhalation via vapours (for volatile compounds) where such pathways are complete.

3.4 Remedial Strategy

The following presents a summary of the remedial requirements. It is noted that this document should be read in conjunction with the remedial action plan (RAP, JBS&G 2016) prepared for the site.

Based on the known contaminant conditions as outlined above and with consideration to the proposed development, the following remedial strategy has been adopted for implementation during the proposed works:

- Excavation and off-site disposal of material surplus to development requirements; and
- Implementation of a separation layer for human health and plants from impacted fill material resulting in onsite capping of impacted material. This was required to include as a minimum, a permanent concrete slab or other permanent pavement; a minimum thickness of 0.5 m of suitable soil material in non-paved areas, or 1.5 m in deep planting areas, and implementation of a long term environmental management plan (EMP).

Additional information is supplied in the RAP with respect to management of impacted soils from an occupational hygiene perspective, including asbestos impacted material which have been incorporated into this REMP.

Although it is considered unlikely that vapour inhalation risks to subsurface workers are unacceptable, as a conservative measure it is required that ongoing management of the site includes provision to conduct air monitoring using a PID during excavations and the establishment of a 0.1ppm trigger level (based on sub-chronic risk, to be adjusted for PID lamp) for action (e.g. cease work, active ventilation) in order to appropriately manage risks to human health when undertaken works in areas of VOC vapour impact (**Section 3.3.2**).

4. REMP Responsibilities

4.1 Site Owner

It is the responsibility of the Site Owner (Mirvac), to ensure an appropriately trained Site Environmental Manager is appointed by the Main Contractor (to be advised) to undertake the responsibilities set out in **Section 4.2** below.

4.2 Site Environmental Manager – Main Contractor

In the event that works are required to be undertaken which may involve handling of contaminated material, an appropriately trained Site Environmental Manager appointed by the Main Contractor shall be responsible for the following:

- A person in a senior management position in the Main Contractor's organisation is appointed as the Site Environmental Manager, and given the responsibility for ensuring the REMP (and RAP) is provided to relevant staff and other stakeholders and implemented appropriately;
- The Site Environmental Manager should be supported by the Main Contractor's Health Safety and Environment (HSE) team;
- The REMP is reviewed and updated regularly by an appropriately qualified and experienced person to ensure it complies with updates to regulatory requirements and its relevance to site conditions following works which may be undertaken at the site;
- A copy of the REMP should be provided to the consent authority for review and comment;
- Site personnel or contractors that must conduct intrusive works at the site are inducted into this REMP (and RAP) and made aware of their responsibilities regarding health and safety and also protection of the environment;
- All site personnel and contractors are made aware of existing contamination and a copy of this REMP is supplied to anyone conducting intrusive works across the site;
- The health, safety and environmental requirements specific to the contamination issues on the site, as outlined in this REMP, are complied with;
- Environmental incidents are reported in a timely manner to the appropriate statutory authorities, as necessary in accordance with legislation;
- Management of all operations, employees and subcontractors as relevant to the requirements of this REMP;
- Ensuring compliance with all environmental requirements outlined in this REMP and statutory requirements through the engagement of an environmental consultant to conduct external REMP compliance audits according to the checklist provided as **Error! Reference source not found.**;
- Liaison with the regulatory authorities in relation to environmental matters;
- Co-ordination of, where necessary, environmental monitoring, data assessment and reporting;
- Where necessary, reviewing environmental reports and inspections and initiating any actions to rectify;
- Participation in environmental incident investigations;
- Participation in environmental meetings and programs;

- Oversight of the implementation of environmental management measures at the site; and
- Liaison with the community of the area to address any questions regarding the management areas or this REMP.

4.3 Competence, Training and Awareness

It is the responsibility of the Site Environmental Manager working on the site to ensure that:

- A person in charge of site works (e.g. Site Foreman, Project Manager, Site Supervisor, or similar) is appointed, for the purposes of implementing the measures outlined within this REMP, and are to be responsible for ensuring successful implementation of this REMP including appropriate communication with the Site Owner and/or Site Environmental Manager as required;
- Works are conducted in compliance with the REMP requirements, in addition to any other specific requirements for the tasks undertaken;
- The Site Owner is notified of any unexpected finds encountered during works;
- Any works with asbestos should give appropriate consideration to requirements of Safe Work Australia, Work Safe NSW and other relevant guidelines, codes of practice and standards; and
- Any works involving hazardous materials, contaminated and waste material should be completed in accordance with relevant legislation, guidelines and standards.

It is the responsibility of the Main Contractor to:

- Ensure all staff working on the site are provided with the environmental training required to competently carry out their work;
- Ensure all site staff and contractors are inducted before commencing work in the Site Office by the Site Manager or other relevant personnel; and
- Maintain a Training / Induction Register in the Site Office.

4.4 Contingency and Emergency Response Plans

It is the responsibility of the Main Contractor to ensure that:

- Induction for all staff and subcontractors working on the site includes training on the potential environmental emergencies, relevant environmental safeguards and risk mitigation measures.
- An Incident and Emergency Response Procedure (IERP) will be established prior to commencement of work and communicated to all site personnel and followed for the duration of the works; and,
- Contact details for site emergency response personnel as detailed in **Table 4.1** are available on site to site staff.

Table 4.1: Emergency Contacts

Emergency Contact	Contact number
The Council of the City of Sydney	02 9265 9333
Emergency Services (Police, Fire, Hazmat, Ambulance)	000/112
Redfern Station Medical Centre (147-151 Redfern St, Redfern)	02 8313 2999
SES	132 500
Work Safe NSW	9370 5877
EPA Pollution	131 555
Site Environment Manager (to be confirmed)	To be confirmed
Site Manage (to be confirmed)	To be confirmed

Emergency Contact	Contact number
Site Owner (Chris Callaghan from Mirvac)	0414 238 368
Environmental Consultant (Jordan Lyons from JBS&G)	0410 578 860

The possibility exists for hazards that have not been identified to date to be present within fill materials or underlying pavements/building on the site. The nature of hazards which may be present and which may be discovered at the site are generally detectable through visual or olfactory means, for example:

- The presence of significant aggregates of friable asbestos materials (visible) as opposed to minor occurrences of fragments or fibre bundles in soil;
- Excessive quantities of Construction/Demolition Waste (visible);
- Hydrocarbon impacted materials (visible/odorous);
- Drums, waste pits, former pipework or underground storage tanks (USTs) (visible);
- Oily Ash and/or oily slag contaminated soils/fill materials (visible/odorous);
- Tarry like impacted soil/fill material (visible/odorous).

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances (or any other unexpected potentially hazardous substance) be identified, the procedure summarised in **Chart 1** is to be followed.

An enlarged version of the unexpected finds protocol, suitable for use on site, should be posted in the Site Office and referred to during the Site-Specific Induction.

The sampling strategy for each “unexpected find” shall be designed by a suitably qualified Environmental Consultant (JBS&G). The strategy will, however, be aimed at determining the nature of the substance – that is, is it hazardous and, if so, is it at concentrations which pose an unacceptable risk to human health or the environment.

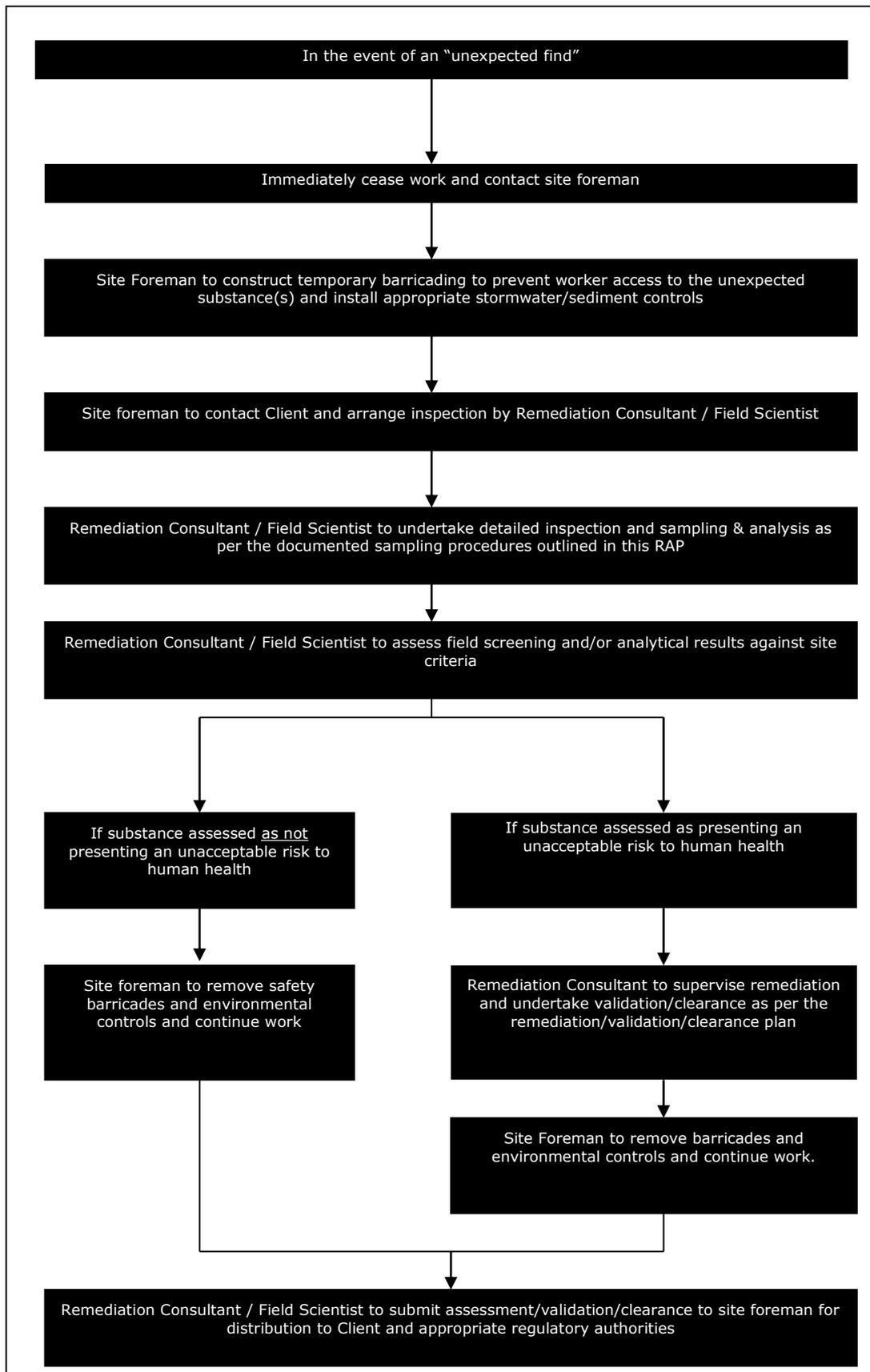
The sampling frequency of the identified substance/materials shall meet the minimum requirements outlined in EPA (1995) Sample Design Guidelines.

4.5 Monitoring, Inspection and Auditing

It is the responsibility of the Site Environmental Manager to ensure that:

- Environmental inspections are undertaken weekly by an appropriately qualified and competent person and appropriately documented in an Environmental Inspection Report, and that additional erosion and sediment control inspections are conducted after more than 10 mm of rain in a 24-hr period;
- A visual inspection and validation sampling is undertaken by a suitably qualified Environmental Consultant (JBS&G) after earthworks, removal of stockpiles, construction and at the completion of works in accordance with the requirements of this REMP and the RAP for the site; and
- Copies of Environmental Inspection Reports prepared by an appropriately qualified and competent person, as kept with development project records.

Chart.1 - Unexpected Finds Protocol



5. Management of Potential Impacts

Management measures for the construction of the site are described in **Section** Error! Reference source not found. below. Remediation works shall be completed in accordance with the permissible hours of work and noise as nominated in of the Development Consent.

5.1 Management Measures of Potential Impacts

Excavation Works		EMP01
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	At any time there is ground disturbance	
Objective:	To minimise exposure of contractors and site personnel to impacted sub-surface soils, soil vapour and groundwater during future excavation works	
Procedure		
<p>Fill material impacted with PAHs, TRH, VOCs and heavy metals in addition to asbestos (in isolated areas) has been reported beneath existing hardstand pavements. In addition, soil vapour and groundwater impacts have been reported.</p> <p>Access to the subsurface material (i.e. any contaminated material below existing hardstands) at the site will be controlled by way of a Works Permit provided by the Site Environmental Manager to the onsite workers, including site employees, subcontractors and infrastructure maintenance personnel (water, gas, telecommunications etc. providers in addition to building and landscape maintenance personnel). Issue of a Works Permit will be dependent upon preparation of an appropriate Safe Work Method Statement (SWMS) including Job Safety Analysis in addition to any other appropriate documents which may be appropriate for the proposed works.</p> <p>The SWMS are to be submitted to the Site Environmental Manager shall include as a minimum:</p> <ul style="list-style-type: none"> Contractors undertaking ground disturbance works on the site shall be notified prior to the commencement of any site works of the occurrence of PAH, TRH, heavy metal, VOC and asbestos impacted fill material and the presence of potential soil vapour and groundwater impacts. Excavation/disturbance works shall only commence where appropriate precautions are taken, such as use of the correct PPE, as outlined below. Implementation of dust and sediment control procedures as outlined in EMP02 and EMP03 inclusive during all site excavation works. Where site disturbance activities are in proximity to VOC vapour impacts (Figure 2), as a conservative measure it is required that ongoing management of the site includes provision to conduct air monitoring using a PID during excavations and the establishment of a 0.1ppm trigger level (based on sub-chronic risk, to be adjusted for PID lamp) for action (e.g. cease work, active ventilation) in order to appropriately manage risks to human health. The area of the excavation/disturbance shall be barricaded to prevent access of unprotected site personnel and contractors. <p>All workers likely to be in contact with contaminated soil are required to meet the applicable personal protective equipment (PPE) requirements as outlined below, and must have undertaken Occupational Health and Induction Training as defined in Part 8.2 of the <i>Work Health and Safety Regulation 2011</i>. Any person required to directly contact soils shall be required to wear the following PPE:</p> <ul style="list-style-type: none"> P2 (or higher) class half face respirator; Disposable coveralls made from materials which provide adequate protection against fibre penetration; Overboot covers; and Gloves. <p>Should additional works identify the extent of asbestos impact is isolated, then following remediation/management of known asbestos impacts, then PPE required to manage potential ensure to airborne asbestos may be removed.</p> <p>All materials are required to be tracked in accordance with the requirements of the RAP.</p> <p>Excavated materials are to be separated during excavation works as applicable, into either pavement materials or impacted soils. They are then to be stockpiled separately in a manner that minimises the potential for contamination of materials other than the impacted material at the site. In addition, impacted soils are to be placed either on an impermeable surface, such as builder's plastic, or within a skip or similar container during works to address the potential for impacts to areas surrounding the excavation.</p> <p>The following procedures are required to be implemented by the Remedial Contractor:</p> <ul style="list-style-type: none"> No stockpiles of soil or other materials shall be placed on footpaths or nature strips unless prior Council approval has been obtained; All stockpiles of soil or other materials shall be placed away from drainage lines gutters or stormwater pits or inlets; All stockpiles of soil or other materials likely to generate dust or odours shall be covered; All stockpiles of chemically contaminated soil shall be stored in a secure area and be covered if remaining more than 24 hours (if located external to the Locomotive Workshops where exposed to the elements); and All stockpiles of asbestos contaminated soils shall be kept damp and covered to minimise potential fibre release, and if left for more than 24 hours, be stored in a secure area. <p>Where materials (soil) disturbed during excavation works cannot be returned to the excavation, this material shall be disposed of off-Site in accordance with the requirements of NSW EPA <i>Waste Classification Guidelines Part 1: Classifying Waste</i> (2014) or as updated by NSW EPA and tracked in accordance with the RAP requirements.</p> <p>All plant is required to be free of affixed soil/sediment prior to leaving site (i.e. decontaminated).</p>		

Stormwater and Sediment		EMP02
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	Continuously during any future ground disturbance works within the site	
Objective:	To minimise sediment migration during site maintenance, utility installation/maintenance works and/or future development works	
Procedure		
Sediment controls are required to prevent the generation and consequent migration of sediment from works areas and stockpiles that may potentially be formed by future ground disturbance works (e.g. installation of new/additional, underground utilities).		
The following controls shall be implemented:		
<ul style="list-style-type: none"> • During excavation works, all care must be taken to minimise the areas of disturbance which will result in exposed contaminated soil; • Stockpiles will be as per procedure EMP01 to prevent contamination of exposed surface soils or spread of stockpiled material across remaining areas of the site; • Stockpiles will be covered if left for more than 24 hours (if located external to the Locomotive Workshops where exposed to the elements); • Re- instatement of pavements/physical barrier in any resulting bare areas on the site as soon as practically possible; • During excavation works, where contaminated material is stockpiled external to the Locomotive Workshops, sediment controls will be installed at the down-gradient extent of the stockpiling area and in the vicinity of any on-site drainage structures (drains, pits, etc.), in accordance with Department of Housing 'Managing Urban Stormwater Soils and Construction'. Appropriate inspection and maintenance of sediment controls will be completed for the duration of works; and • Re-surfacing of reinstated excavations must be undertaken as soon as practically possible in accordance with the requirements as of the RAP. 		

Dust and Odours		EMP03
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	Continuously during any future excavation works	
Objective:	To minimise dust emissions from site maintenance, utility installation/maintenance works and/or future development works	
Procedure		
The impacted soil underlying the site has been covered with a physical barrier comprising pavements which form a complete barrier between general site users and the impacted soil. As such, any dusts which may be generated from the final finished ground levels at the site during normal site use will not be associated with contaminated material underlying the site.		
During any future ground disturbance works which may include exposure of potentially impacted material, emissions require to be minimised to the extent that no visible airborne dust is present at the works area boundaries. Controls for each potential dust generating activity that will occur during the site development shall be implemented:		
<ul style="list-style-type: none"> • During ground disturbance works, all care must be taken to minimise the areas of exposed soil; • Where visible dust is observed during excavation works, a fine water spray will be utilised to control the dust; • Dust/shade cloth will be installed on all temporary construction fencing at the extent of the works area to minimise the potential for transport of dust beyond the works area boundaries; and • Dust controls must be implemented around subsequent stockpiled soils. Any dust controls will require regular inspection and maintenance to ensure effective operation until stockpiled material is returned to the excavations or removed from site. 		
Re-surfacing of reinstated excavations must be undertaken as soon as practically possible.		
In addition, where works result in disturbance of potentially impacted materials containing asbestos, air monitoring for asbestos fibres will be conducted by the Environmental Consultant (JBS&G) on two representative workers or plant during/for the duration of intrusive works to confirm no unacceptable risks are posed to site workers (and others using or visiting the site). Monitoring will be conducted in accordance with <i>Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres</i> , 2nd Edition (NOHSC: 3003 [2005]), <i>NSW Work Health and Safety Act 2011</i> (NSW WHS 2011) and <i>NSW Work Health and Safety Regulation 2017</i> (NSW WHS 2017). Detection limits above 0.01 fibres/mL will require work to cease and a review of control measures in that area.		
<u>Stockpiling</u>		
In the event that stockpiling of excavated material is necessary during works, the following should be implemented:		
<ul style="list-style-type: none"> • Minimisation of stockpile heights and batters to reduce exposed faces; • Minimising stockpiles with high proportion of fines at the stockpile surface; • If left for more than 24 hours (if located external to the Locomotive Workshops where exposed to the elements), the stockpile is required to be covered (EMP01 and EMP02); and • Consideration of regular dampening stockpiles with a fine water spray or covering with appropriate geotextile material during unfavourable weather conditions. 		
<u>Trucks and Plant</u>		
Where excavated material is subject to off-site disposal, all loads will be covered on the completion of loading and prior to vehicle movement off site. Truck movements will be kept to a minimum and trucks will be required to use sealed (paved) surfaces whenever possible to minimise dust generation.		
All material handling and movement is required to be undertaken in accordance with relevant asbestos WHS guidelines and tracked in accordance with the requirements of the RAP.		
All plant is required to be free of soil prior to leaving the site (i.e. decontaminated).		
<u>Odours</u>		
If odours are encountered (which is considered unlikely) the following actions should be undertaken:		

- Reduction in earthworks activities within odorous material areas during adverse meteorological conditions; and,
- Application of odour masking solutions at the odour source or between identified source(s) and receptor(s).

Materials Importation		EMP04
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	As material is required to be imported	
Objective:	To ensure only environmentally suitable material is imported	
Procedure		
Any existing soils excavated to be reused on the site must be analysed and classified by an appropriately qualified and experienced Environmental Consultant (JBS&G), in accordance with the RAP prepared for the site.		
Any fill material that is imported onto the site must comprise Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM) or other suitable material in accordance with the relevant Resource Recovery Exemption issued under the Protection of the Environment Operations (Waste) Regulation 2014 and meet the materials importation requirements of the RAP.		
All materials are required to be tracked in accordance with the RAP.		

Flora and Fauna		EMP05
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	As required	
Objective:	No unintentional removal of flora and fauna occurs.	
Procedure (It is envisaged that this procedure will only apply to areas to the east of the Locomotive Workshops (i.e. Innovation Plaza) where mature trees / planter beds exist).		
Clearly identify and minimise the vegetation to be removed and trimmed to reduce the unnecessary loss of vegetation.		
Where possible unload excavation machine, plant and equipment as close to where they are required to minimise the area being impacted.		
Ensure contractors are inducted in the avoidance of disturbing vegetation.		
Establish No Go Zones to restrict works to within the area of proposed disturbance and to minimise the potential for affecting flora and fauna outside of the work area.		
Do not place stockpiled materials inside vegetation protection areas or within 5 m of trees to be retained.		
Ensure stockpiling of soil that may contain seed of exotic species is away from adjacent vegetation or stormwater drains where they could be spread during rainfall events.		
Ensure all vehicles and equipment entering the site are weed free.		
Trees to be retained shall be managed and fenced off from the proposed development with a 1.8m high chain wire mesh supported by robust posts. Any tree to be retained must be clearly signed 'TREE PROTECTION ZONE, DO NOT ENTER'.		
No development or activity must occur within the fenced (Tree Protection Zone) TPZ.		
Demolition works within the TPZ of trees to be preserved shall be carried out so as to avoid damage to tree roots. Manual excavation shall be carried out under the supervision of the project Arborist to identify roots critical to tree stability. Where the Project Arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressing or paints. It is totally unacceptable for roots within the TPZ to be pruned with machinery such as backhoes or excavators.		
Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out.		
All areas enclosed by protective fencing must have the entire ground surface mulched to a depth of 75mm with composted Eucalyptus leaf and woodchip to help retain soil moisture and reduce erosion.		
Where stormwater and sewer lines need to be installed within the TPZ of trees nominated for preservation trenching for stormwater/sewer installation within the TPZ and SRZ shall be avoided. Adopt directional drilling/approved under boring techniques as per Section 4 of AS4970 CL.4.5 to avoid adverse impacts on tree roots.		
The crowns of all significant trees nominated for preservation are clear of the proposed development.		
Install tree trunk/ branch batten protection boards as per Section 4.5.2 of Australian Standard (AS4979-2009): Protection of Trees on Development Sites.		
In addition, all works are required to be undertaken in accordance with any flora and fauna sub plans prepared for the site.		

Groundwater		EMP06
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	As required	
Objective:	No surface water or soil contamination as result of intercepted groundwater is released from site	
Procedure		
No uncontrolled abstraction of groundwater at the site can occur due to the presence of heavy metals, TRH, VOCs and PAHs in the groundwater.		
If any potentially contaminated groundwater requires management during works on site, will be done so by either: removal as a waste by a licensed contractor and disposed off-site in accordance with relevant waste regulations and guidelines and the Sydney Coastal Councils Groundwater Management Handbook (SCC, 2006), or assessed and treated where required prior to discharge under appropriate approval to enable discharge to stormwater and for sewer (with treatment) if required.		

Avoid excavation below 2.5 m of the current surface level during construction due to groundwater levels.

In the case that groundwater is intercepted, the contractors must immediately cease any further excavation work and adopt the following protocol:

- Intercepted groundwater must be contained and not enabled to leave the excavated pit, in the case of potential overflowing the rim of the excavation should be sandbagged;
- Intercepted groundwater should be pumped from the excavation and into a sealed container, care should be taken not to withdraw more water than necessary;
- The excavation should be appropriately backfilled and compacted; and,
- The collected groundwater should be classified by an appropriately trained environmental consultant and if contamination levels are reported above adopted guidelines, removal as a waste by a licensed contractor and disposed off-site. If the groundwater is not classified as contaminated and achieves stormwater criteria, stormwater disposal is permitted.

Waste Management	EMP07
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Responsibility:	The Site Environmental Manager (refer to Section 4.2)
Frequency:	As required
Objective:	Ensure compliance with regulatory requirements

Procedure

Any construction waste soil or other soil material to be disposed off-site should be analysed and classified by an appropriately qualified and experienced environmental consultant, in accordance with relevant NSW EPA guidelines including the “Waste Classification Guidelines” 2014, and the RAP prior to off-site disposal.

Excavated material is to be transported to an appropriately licensed waste facility by an EPA licensed waste contractor in accordance with relevant NSW EPA guidelines.

Materials removed from site for waste disposal should be classified prior to removal, and tracked from ‘cradle to grave’ with transport and disposal documentation maintained consistent with relevant regulatory requirements.

Any asbestos waste must be removed, transported and disposed as special waste in accordance with relevant guidelines and legislative requirements.

All materials movement is required to be tracked in accordance with the RAP requirements and the NSW POEO Regulation 2014 requirements.

In addition, all works are required to be undertaken in accordance with any waste management sub plans prepared for the site.

Health and Safety	EMP08
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Responsibility:	The Site Environmental Manager (refer to Section 4.2)
Frequency:	Continuous
Objective:	To ensure the health and safety of site works and site users

Procedure

The site must be fenced (or secured), appropriately signed to inform and restrict unauthorised access.

The site is appropriately lit and free from trip hazards to ensure safe access and reduce the risk of slip, trips and falls.

Only work during works hours and ensure site is securely locked up at all times.

All personal onsite complete a site induction and are aware of hazards.

Site workers only perform tasks within their capabilities and only operate machinery in which they are licenced.

All site personal abide by relevant Occupational Health and Safety legislation provided in Section **Error! Reference source not found.: Error! Reference source not found.:**

- Work Health and Safety Act 2011 (WHS Act 2011)
- Work Health and Safety Regulation, 2017 (WHS Regulations, 2017)

All site personal must also abide by national relevant national legislation including:

- Road Transport Reform (Dangerous Goods) Act 1995
- National Code of Practice for the Prevention of Falls in General Construction (2008)
- Workplace Injury and Disease Recording Standard in the Workplace (AS 1885.1-1990)

All loading, unloading and handling of materials for the project must be carried out wholly within the site boundaries.

Construction vehicle access and egress must be in accordance with the traffic management sub plan prepared for the site.

During construction, delivery vehicles, concrete trucks and trade vehicles must be unloaded on site as close as possible to the required location.

Noise		EMP09
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	Continuous	
Objective:	Ensure compliance with regulatory requirements	
Procedure		
<p>Notify Council prior to commencement of work as per the requirements of SEPP 55 and the development consent.</p> <p>Only conduct works during the specified working hours.</p> <p>Approved working hours on this project are:</p> <ul style="list-style-type: none"> Monday to Friday 7:30 am to 5:30 pm; and Saturdays 7:30 am to 3:30 pm. No work will be conducted on Sundays and Public Holidays. <p>Complaints related to noise or any other aspect of works will be noted by the contractor and forwarded to the Site Manager and Mirvac for resolution.</p> <p>All deliveries to and from the site must be made during the scheduled work hours.</p> <p>Noise from machinery will be minimised by:</p> <ul style="list-style-type: none"> Selecting machinery that makes less noise; Enclosing noisy equipment, if practicable; Fitting and maintaining appropriate mufflers on earth-moving and other vehicles on site; Plant will be turned off or powered down when not in use; Ensuring plant is well maintained; and, Ensuring plant is not idling unnecessarily. <p>Engine and exhaust brakes will not be used on site except for emergency situations.</p> <p>Neighbours will be informed of the nature, duration and hours of work if noise from construction activities are likely to impact on them, prior to works being carried out.</p> <p>Details of any complaints should be recorded in a site register and reported back to Mirvac.</p>		

Heritage		EMP10
Responsibility:	The Site Environmental Manager (refer to Section 4.2)	
Frequency:	As required	
Objective:	Ensure compliance with regulatory requirements and the heritage plan	
Procedure		
<p>Prior to any ground disturbance, approval must be obtained from the heritage consultant/OEH and all works are required to be undertaken in accordance with any heritage sub plans prepared for the site.</p>		

6. REMP Review

It may, on occasion, be necessary to revise the REMP to reflect changes to legislation and/or regulatory requirements and/or changes in site conditions, where these influence implementations of the REMP, for example:

- Revision of the REMP will be necessary if the details in the REMP have changed (i.e. further assessment provides additional data to inform the REMP or unexpected impacts are encountered during site works);
- Revision of the REMP will be necessary on completion of development works to incorporate the design details;

Revision of the REMP should be undertaken by an appropriately qualified and experienced environmental consultant (JBS&G) and copies of the revised REMP should be distributed to the current Environmental Manager for on-going implementation.

A copy of the revised REMP should also be provided to the consent authority for review and comment following any changes.

The Site Environmental Manager should ensure that the most current, up-to-date, REMP is provided to any workers on site as part of the REMP induction requirements for works on site.

7. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

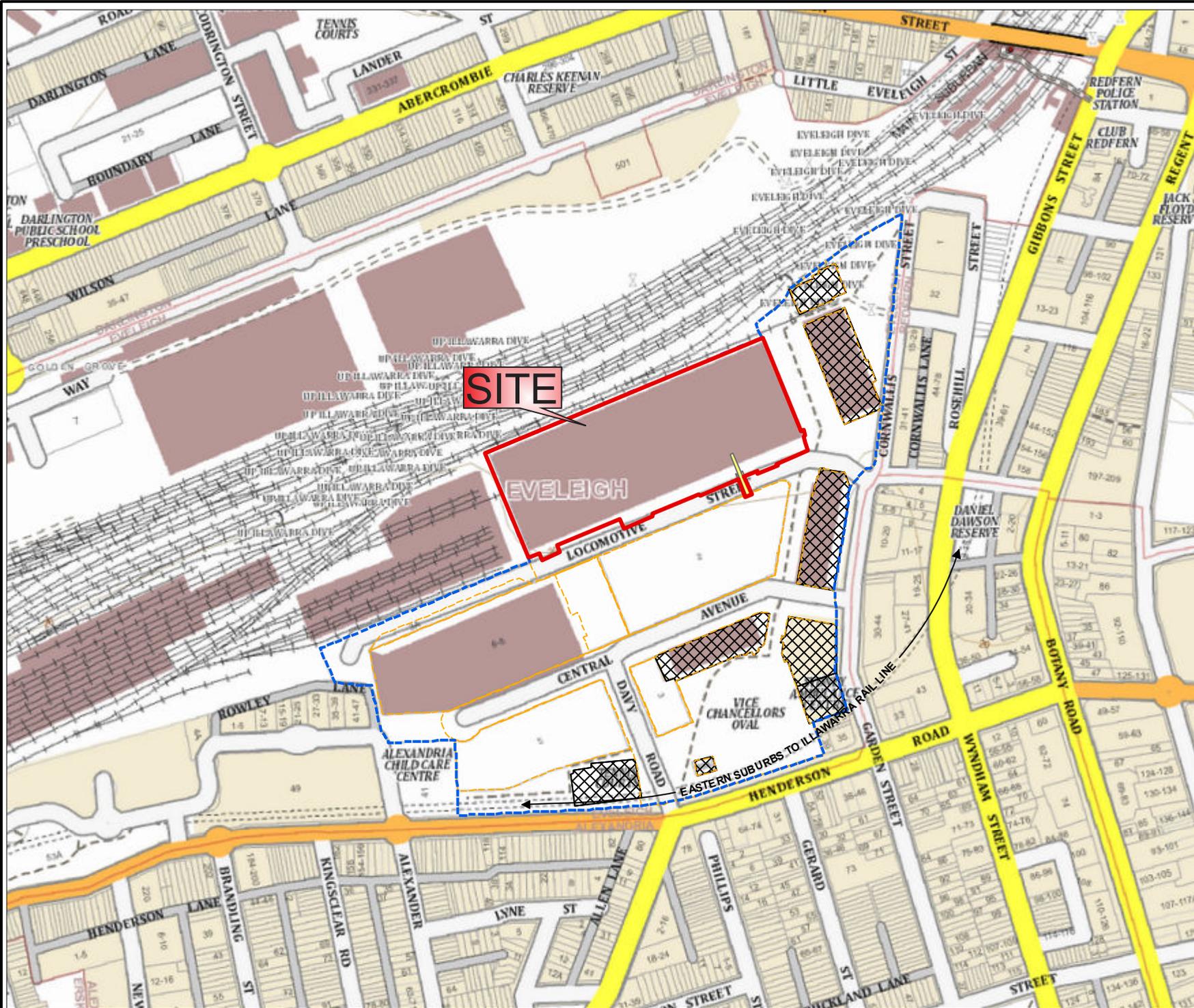
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Figures



Legend:

- Approximate Site Boundary - Locomotive Workshop/Travelator
- Location of Travelator
- Approximate Boundary - ATP
- Cadastral Boundaries
- Cadastral Boundaries Excluded from the ATP Precinct



Client: Mirvac

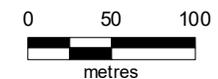
Version: R37 Rev A

Date: 04-Dec-2018

Drawn By: RF

Checked By: RF

Scale 1:4,500



Coor. Sys. GDA 1994 MGA Zone 56

**Australia Technology Park
Eveleigh, NSW**

SITE LOCATION

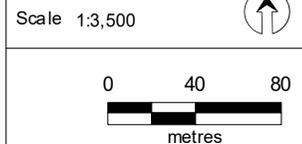
FIGURE 1:



- Legend:**
- Approximate Site Boundary - Locomotive Workshop/Travelator
 - Approximate Boundary - ATP Precinct
 - Cadastral Boundaries
 - Cadastral Boundaries Excluded from the ATP Precinct
 - Location of Travelator
 - Locomotive Workshop - Bay Number
 - Area of VOC Impact



Job No: 51142
 Client: Mirvac
 Version: R37 Rev A Date: 04-Dec-2018
 Drawn By: RF Checked By: JL



Coord. Sys. GDA 1994 MGA Zone 56

**Australia Technology Park
 Eveleigh, NSW**

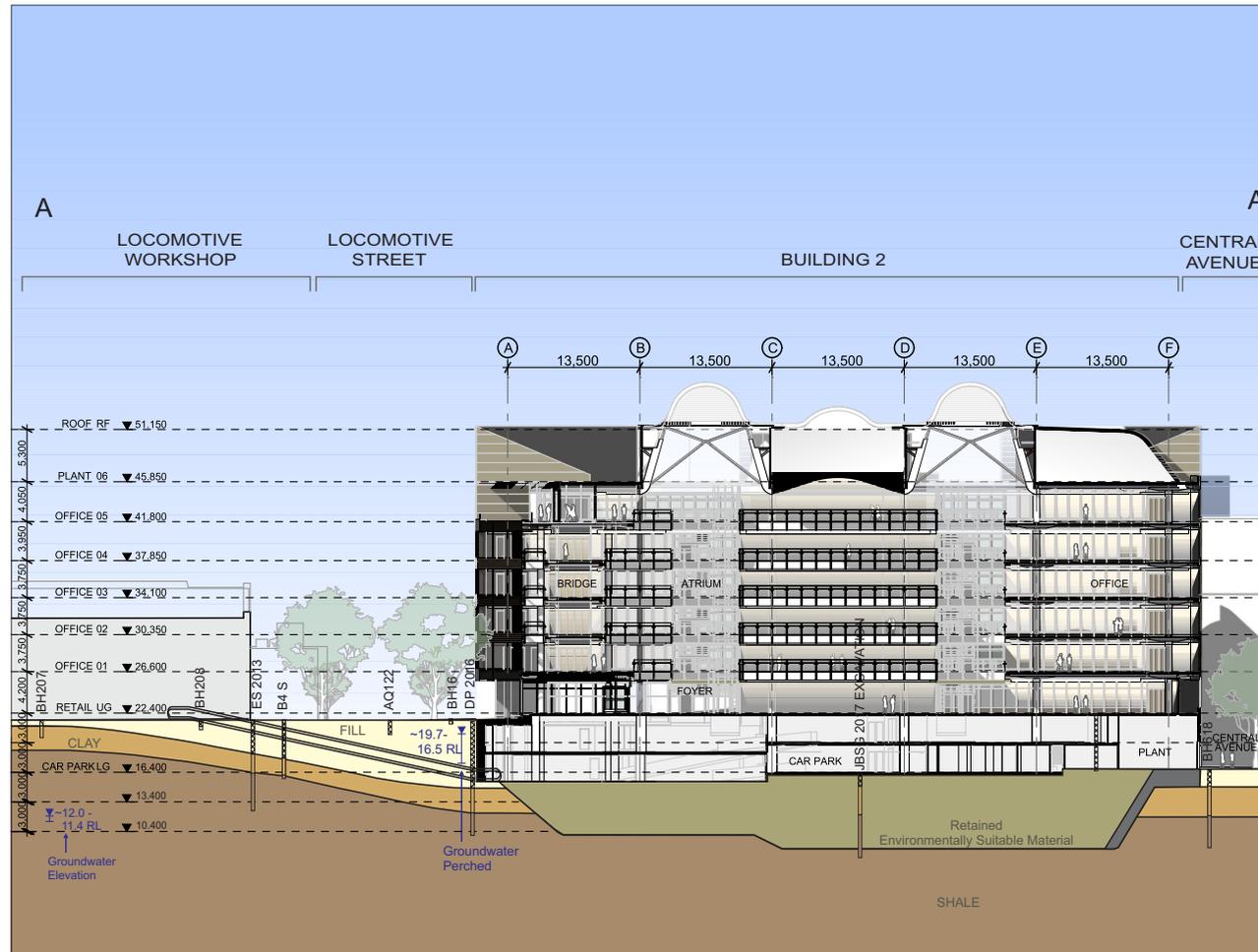
SITE LAYOUT

FIGURE 2:

ID	Easting	Northing
A	332986.728	6248047.729
B	333229.256	6248148.140
C	333269.400	6248049.823
D	333213.302	6248027.170
E	333219.439	6248012.356
F	333214.357	6248010.251
G	333208.221	6248025.065
H	333107.925	6247982.783
I	333104.800	6247990.326
J	333049.943	6247967.622
K	333052.313	6247961.834
L	333036.732	6247955.380
M	333034.355	6247961.117
O	333024.274	6247957.206

Legend:

- SHALE
- CLAY
- FILL
- Retained Environmentally Suitable Material



Client: Mirvac

Version: R37 Rev A Date: 04-Dec-2018

Drawn By: RF Checked By: JL

Not to Scale

**Australia Technology Park
Eveleigh, NSW**

**SCHEMATIC REPRESENTATION
TRAVELATOR & ASSESSMENT
AREA LITHOLOGY**

FIGURE 3:

Appendix A Environmental Incident Register

SURFACE COVER – AD HOC INSPECTION CHECKLIST

The following checklist should be used on an ad hoc basis. It may be appropriate for such assessments to be made following heavy rainfall episodes which could disturb or remove surface cover and expose landfill materials or visible ACM.

Compliance Questions	Yes (✓/x)	No (✓/x)	Outcome
Site Capping Layer Inspection Date:			
Is there any degradation in site cover?			If no, no further action is required.
			If yes, the site surface should be repaired appropriately to ensure subsurface soils are adequately covered.
Have any landfill soils or visible ACM been exposed?			If no, no further action is required.
			If yes, any visible ACM fragments exposed will need to be removed in compliance with the requirements of the WorkCover Code of Practice ‘How to manage and control asbestos in the workplace’, other relevant regulatory requirements; Any other waste material exposed or other unexpected finds should be managed in compliance with this EMP and relevant regulatory requirements.

DUST MANAGEMENT CHECKLIST

During intrusive works that will disturb asbestos or other impacted soils, the following checklist should be completed on a daily basis.

Compliance Questions	Yes (✓/x)	No (✓/x)	Outcome
Dust Management Inspection Date:			
Has all exposed soil/fill in stockpiles and walls and floors of excavations been kept moist?			If no, corrective actions such as wetting down the area with a hose must be taken.
			If yes, no further action is required.
Is excess run-off being caused by over wetting?			If no, no further action is required.
			If yes, stop wetting and ensure appropriate sediment controls are in place.
Is visible dust migrating from the work site area?			If no, no further action is required.
			If yes, work should cease until such time as dust is controlled or conditions causing dust migration (e.g. excessive wind) improves.
Any non-compliances or migration of dust from site boundaries should be reported to the Environmental Manager and appropriate information recorded in the Environmental Incidents Register.			

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2	Jordan Lyons	Joanne Rosner	Joanne Rosner		26/03/2019

