



ACT
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Suburban Land
Agency

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NH



Kingston Arts Precinct

1D: PRECINCT CONCEPT DESIGN REPORT

VOLUME 2 - APPENDICES

SECTION 10.0 - CONTAMINATION RESPONSE TO ESO

JANUARY 2024

NH Architecture

ARUP

rwa
rush/wright associates


Communication Link



REACTIVATE

WSP

pwc

STEGER
registered
land
surveyors



Morris Goding
Access Consulting

We acknowledge that the Kingston Arts Precinct is on the land of the Ngunnawal People who have a profound and ongoing connection to Country & recognise any other people or families with connection to the lands of the ACT and ACT region. The Kingston Arts Precinct provides the Canberra community with valuable opportunity to learn, share and celebrate history and culture in the spirit of reconciliation.

We would also like to recognise that our project team members live and work on Traditional Aboriginal Lands across the South-East of this continent. We pay our respects to the Traditional Custodians of Wurundjeri Country (our studio), Boonwurrung Country, Ngunnawal Country, Dharawal Country, Gadigal Country and Cammeraygal Country, and their Elders past, present and emerging.

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8 June 2023

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Re: Kingston Arts Precinct - Contamination review and EMP implementation summary: Blocks 12 and 15, Section 49 Kingston, ACT

Dear Lucinda,

1 Introduction

EMM Consulting Pty Limited (EMM) was engaged by NH Architecture Pty Ltd (NH) to undertake a contamination review of and evaluation of environmental management plan (EMP) implementation requirements for the Kingston Arts Precinct (KAP) property located at Blocks 12 and 15, Section 49 Kingston, ACT (the site). The site comprises a mixed-use precinct that incorporates a range of public, arts and private spaces including:

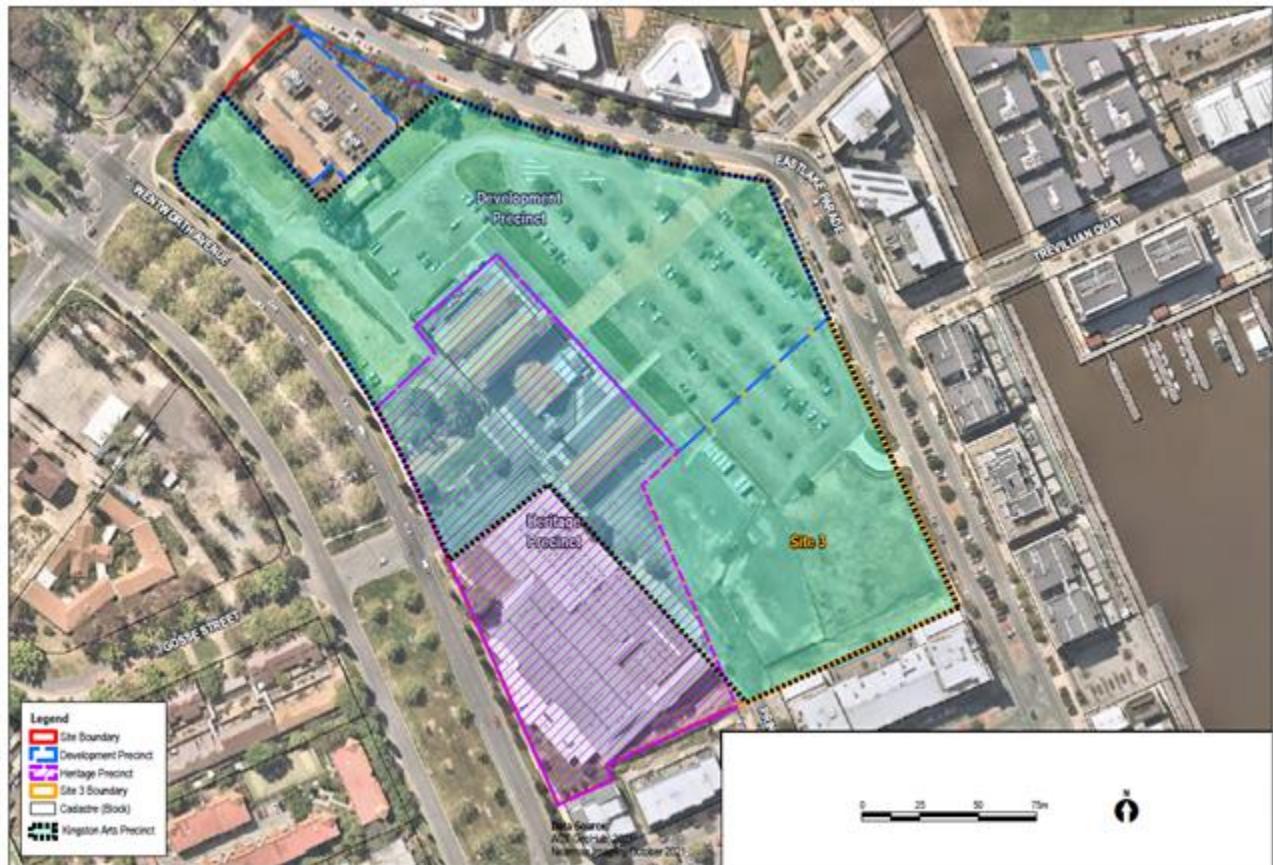
- new buildings for arts organisations, including retail spaces, artist accommodation and open events space
- public spaces
- public carparking
- spaces for residential dwellings and other permissible uses to complement the surrounding Kingston Foreshore and broader Kingston area.

It is understood that NH requires:

- review of relevant historical documentation, including site audits and existing relevant EMPs
- an assessment of identified contamination at the site that may need consideration during the future development of the site
- an assessment of suitability of EMPs for implementation during future construction and management of the site.

In preparing this review, EMM has reviewed the Environmental Significance Opinion (ESO, ACT Planning and Land Authority), Site Audit Report (SAR, Golder, 2021) Site Audit Statement (SAS, Golder, 2021) and various EMP's relating to the site. These reports included summaries of other applicable investigation reports, however a more detailed review of other reports and documents has not been undertaken by EMM as part of this initial contamination review.

The location of the site, including discrete areas showing the site boundary, Development Precinct, Heritage Precinct and Site 3 boundary is shown on Figure 1.1.



Source: adapted from ERM (2022)

Figure 1.1 Site layout

2 Background

The KAP is the final stage of the Kingston Foreshore development and will be located at Section 49 Kingston (located off Eastlake Parade bound by Giles Street and Wentworth Avenue). The site encompasses:

- Block 15, which includes an existing carpark, vacant building site and Telopea Park electrical substation
- Block 12, being the existing Powerhouse currently utilised as an arts space by Canberra Glassworks
- the wider Section 49 also includes Block 14, which comprises the former Bus Depot site.

2.1 Proposed future land use

The proposed future land use is described as ‘mixed use’ (WSP, 2020), as permitted by its zoning ‘CZ-5 Mixed Zone’ and “MT8” of the Kingston Precinct Map as detailed in the ACT Territory Plan 2008 (updated on 22 December 2020).

The SAR (Golder, 2021a) notes the proposed redevelopment of the site will include:

- commercial buildings (which may also include residential) to be constructed between the former Kingston Powerhouse and Wentworth Avenue
- the buildings may contain basement carpark
- the buildings would be under private crown lease
- a commercial building (with no basement parking) will be constructed between the former Kingston Powerhouse and Wentworth Avenue
- childcare facilities may be constructed within the commercial development on levels above ground floor (with no on-ground facilities)
- open space areas consisting of:
 - shared roads which will either be compacted asphalt or stone pavers
 - pedestrian area with either limestone pavers, in-situ concrete or compared decomposed granite
 - soft landscaping including grassed areas
 - timber decking.

The former Kingston Powerhouse and Fitters Workshop are heritage listed in the ACT under the *Heritage Act* (2004). Specifically, the former Kingston Powerhouse and Fitters Workshop are to be conserved, and the “prior use as an industrial site for the generation of electricity should continue to be evident and accessible to the public”. Furthermore, the former Kingston Powerhouse is to “remain the dominant feature of the Precinct in any future development”.

2.2 Previously identified contamination

Historical site investigations have variably identified the following contaminants at the site:

- ash containing elevated benzo[a]pyrene (B[a]P)
- potential asbestos
- building waste
- other potentially contaminated soils (hydrocarbons, heavy metals and PAH)
- hydrocarbon impacted groundwater.

Due to the nature of identified contamination, the site was placed on the ACT’s Contaminated Sites Register.

2.3 Land use suitability

Recent relevant studies that have been prepared for the project include three independent Site Audit Reports (SARs) and Site Audit Statements (SAS). The SAS for all three audits confirmed suitability for the proposed land uses under the Territory Plan (CZ5 – Mixed Use Zone) and have therefore been endorsed by the EPA, on the basis that the development works are undertaken in accordance with the relevant audit conditions and environmental management requirements.

An environmental significance opinion (ESO) was also prepared by the ACT planning and land authority, under section 138AA of the *Planning and Development Act 2007* (the Act). The ESO concluded that based on the information submitted with the ESO application and the comments received, the proposal is unlikely to cause a significant adverse environmental impact, provided the works are undertaken in a manner consistent with the conditions attached to the ESO, which states:

The proposed development must be carried out in accordance with the conditions contained in the EPA endorsement letter “Endorsement of Site Audit Statement and Report - Block 12 and part Block 15 Section 49 Kingston Canberra Central” dated 30 June 2021 related to the site which states “Blocks 12 and 15 Section 49 Kingston have been assessed, remediated and independently audited. As a result, EPA supports the proposal subject to requirements being implemented for the proposed development to be carried out in accordance with the conditions contained in the EPA endorsement letter related to the site.”

EMM concurs with the ESO conclusions.

3 Previous reports

The following recent, relevant reports have been prepared to inform the understanding and management of contamination at the Site.

- Environmental Resources Management Australia Pty Ltd (ERM). 2022. Soil Management Report, dated 25 November.
- ACT EPA. 2021. Endorsement of Site Audit Statement and Report - Block 12 And Part Block 15 Section 49 Kingston Canberra Central, dated 30 June.
- Golder Associates Pty Ltd (Golder). 2021a. Site Audit Report (SAR) titled "Former Kingston Powerhouse, Fitters Workshop and Associated Open Space within the Heritage Precinct of Section 49, Kingston Foreshore Development Precinct, ACT Site Audit Report", dated 16 June 2021.
- Golder. 2021b. Site Audit Statement (SAS), (RJP 031 – ACT), dated 16 June 2021.
- Agon Environmental Pty Ltd. 2021. Site Management Plan Minor Works, Powerhouse Complex and Associated Open Space Areas, Kingston Foreshore Section 49, ACT, document JC0715, dated 21 March.
- WSP Australia Pty Ltd (WSP). 2021a. Development Environmental Management Plan, Powerhouse Complex and Associated Open Space Areas – Kingston Foreshore Section 49, ACT, document no. PS103124-CLM-REP-101 RevF, dated April 2021.
- WSP. 2021b. Occupancy Environmental Management Plan, Powerhouse Complex and Associated Open Space Areas – Kingston Foreshore Section 49, ACT, document no. PS103124-CLM-REP-102 RevF, dated April 2021.

- Senversa Pty Ltd. 2019. Site Management Plan, Kingston Foreshore, document no. C11343_SMP_Rev5, dated October 2019.

Other relevant documents:

- WSP. 2020. Detailed Site Investigation Kingston Foreshore Section 49. Rev.J, dated September 2020.
- AECOM. 2016. UPSS Decommissioning, Kingston Heritage Precinct, document no. 60479349-RPT-001, prepared 11 May 2016.
- Golder. 2015. Site 3, Kingston Foreshore Development Precinct, Kingston, ACT, Document no. 99613681-696-L-Rev0, dated 13 November 2015.
- AECOM. 2015d. Section 49 Minor Works, Site Management Plan, document no. 60340908, prepared 24 March 2015.
- AECOM. 2015c. Kingston Foreshore Heritage Precinct, Additional Contamination Assessment, document no. 60188470-CBR-ENV-RPT-101, prepared 11 December 2015.
- AECOM. 2015b. Kingston Stage 3 – Soil Vapour Investigation, September 2014 and July 2015.
- SMEC. 2015. Kingston Foreshore Park Section 49 Geotechnical and Utilities Factual Report, prepared for: Shared Services Procurement, project reference 3002398, dated 14 Jan 2015. AECOM 2015a, Phase 2 Environmental Site Assessment, Section 49 Kingston Foreshore – Development Precinct, document no. 60156800, dated 9 May 2014.
- AECOM. 2013. Environmental Site Assessment, Kingston Foreshore Development Precinct Package 2 (Draft). Document no. 60156800-KFDP2_B, dated 20 June 2013.
- AECOM. 2012. Targeted Environmental Site Assessment, Site 3 - Kingston Foreshore Development Precinct (draft). Document no. 60247779, dated 26 April 2012.
- Golder 2005. Site Audit Statement and Summary Site Audit Report, Package 3 (Site 3), Kingston Foreshore Development. Document no. 99613681/100, dated February 2005.
- Coffey Geosciences Pty Ltd (Coffey). 2004. Contaminant Management Plan, Site 3 Kingston Foreshore Development Precinct, date 13 July 2004.
- Brown and Root 2001. Kingston Foreshore Development: Site Validation Investigations - Stage 1a. Report No. CV0006-004.

4 Identified site contamination

Based on the information provided in SAR (2021), contamination identified at the site includes:

- elevated concentrations of hydrocarbons (sample location SB424) and lead (sample location SB421) contamination in fill material near the former Kingston Powerhouse
- ash waste material may be present within surface soils associated with fill placed at the site

- potential for contamination to be associated with the historic demolition of the Engineering Services Building and Lubritorium (between the former Kingston Powerhouse and Wentworth Parade) for example due to inappropriate removal of asbestos containing materials (ACM)
- potential for unexpected contamination to be present in areas where investigation was limited, specifically beneath the footprint of the former Kingston Powerhouse and Fitters Workshop
- ACM may be present within surface soils either from the fill placed at the site, demolition of former buildings, and/or due to cross contamination from neighbouring properties and illegal waste disposal within the area
- groundwater sampling undertaken by AECOM between 2011-2019 did not detect widespread groundwater contamination at the site. Localised total recoverable hydrocarbon (TRH) and benzene, toluene, ethylbenzene and xylene (BTEX) impacts were identified at one monitoring well location (MW15), located to the southwest of the Fitters Workshop in close proximity to a former underground storage tank (UST), (AECOM 2016). Benzene was reported at concentrations greater than the adopted drinking water criteria (AECOM 2015a) and elevated TRH results, particularly heavy fraction TRHs ($>C_{16}-C_{34}$ and $>C_{34}-C_{40}$) were also identified (WSP 2021a). Nearby surrounding groundwater monitoring wells located to the north (MW14), south (MW321), east (MW307) and west (MW306) did not report detectable TRH/BTEX results, indicating the impacts at MW15 are isolated
- vapour sampling was undertaken within the former Kingston Powerhouse and the Fitters Workshop, both using soil vapour pins and using ambient air samples. A soil vapour pin was also installed within the former stack located between the former Kingston Powerhouse and the Fitters Workshop. Multiple monitoring rounds (AECOM 2015c, WSP 2019a) did not identify vapours above the site assessment criteria. Therefore, the risk to site users was considered low and acceptable.

Given the known and potential residual contamination present at the site, WSP (2021a,b) developed EMP's for site development [Development Environmental Management Plan (DEMP)], and for occupancy [Occupancy Environmental Management Plan (OEMP)], to address potential risks associated with unexpected finds of contamination and ACM.



Source: Golder (2021a)

Figure 4.1 Investigation locations

5 Conceptual site model

Based on the reported results, WSP (2021) prepared an updated conceptual site model (CSM), which noted the following:

- Potentially complete source-pathway-receptor (SPR) linkages exist between soil contamination identified at the site and:
 - current and future site users (including residents and commercial workers)
 - construction and maintenance workers undertaking site maintenance current
 - construction workers involved in site redevelopment.
- Potentially complete SPR linkages exist between groundwater contamination identified at the site and construction workers during site redevelopment (including basement construction).
- Potentially complete SPR linkages between vapour from contaminated soil or groundwater and future users of the former Kingston Powerhouse and Fitters Workshop if the internal configuration of these buildings were altered.

Based on the CSM and to manage risks to the receptor groups identified as potentially (or actually) contacting site contamination, site EMPs to manage health risks during site development works (when site soil might be exposed), and following occupancy.

6 Environmental management plans

Based on the potential for residual contamination at the site, including asbestos impacted material, aesthetically unstable material (ash/slag), and potential for unidentified contamination and/or unexpected finds to be presented at the site, several EMPs have been prepared for the ongoing management of parts of the site and to reduce potential risks to site users, including:

- SMP, Minor Works (Agon, 2021)
- DEMP (WSP, 2021a)
- OEMP (WSP, 2021b)
- SMP, Kingston Foreshore (Senversa, 2019)
- DEMP (AECOM, 2016)
- OEMP (AECOM, 2016)
- Contaminant Management Plan (CMP) (Coffey, 2004).

In addition, once development of the site has been completed, areas which will remain under the control of the Suburban Land Authority (SLA) such as roads, verges, parks, and open spaces will be managed in accordance with the Kingston Foreshore Development Area (KFDA) site wide site management plan ("Site Management Plan Kingston Foreshore" dated 31 October 2019 by Senversa Pty Ltd).

Below are summaries of the main contents of the EMPs. The land custodian (i.e. SLA) or their appointed delegate is responsible for the implementation of the SMP, DEMP and OEMP throughout the development and future occupation of the site.

6.1 EMP application

6.1.1 Prior to Development – SMP

Pre-development phase

The SMP was originally prepared by AECOM (2015d) when development of the site was considered unlikely. The SMP was prepared for implementation by SLA to manage risks associated with minor site works which may be necessary during the ongoing operation of the site.

The SMP was subsequently updated by Agon Environmental (2021) (superseding the AECOM 2015d document) and is intended to supplement the DEMP (WSP, 2021a) and OEMP (WSP, 2021b) in instances where minor works involving ground disturbance within the Section 49 - Heritage Precinct (Block 12 Section 49 Kingston and Part Block 15 Section 49) are proposed. It is understood that for those areas within the Section 49 – Development Precinct (but outside the Section 49 – Heritage Precinct), works would be undertaken in accordance with the AECOM (2015d) SMP (refer Figure 1.1).

During Development - DEMP

Development Phase

The DEMP (WSP, 2021a) is intended to be implemented at the commencement of development of any portion of Block 12 Section 49 Kingston and Part Block 15 Section 49 (Section 49 - Heritage Precinct). The relevant SMP would remain in place for any areas outside the development area. Once development is completed within any portion of the site, the OEMP (WSP, 2021b) would apply to that portion.

The DEMP, or its revisions as approved by an Authority approved environmental Auditor and endorsed by the Authority, must be implemented until the completion of development of the site by the land custodian of the site or their authorised representative.

For those areas within the Section 49 – Development Precinct (but outside the Section 49 – Heritage Precinct), works would be undertaken in accordance with the AECOM (2016a) DEMP. For those areas within Block 3, works would be undertaken in accordance with the Coffey (2004) CMP (refer Figure 1.1).

6.1.2 Occupancy – OEMP

The OEMP (WSP, 2021b) is intended to be implemented at the commencement of development of any portion of Block 12 Section 49 Kingston and Part Block 15 Section 49.

For those areas within the Section 49 – Development Precinct (but outside the Section 49 – Heritage Precinct), works would be undertaken in accordance with the AECOM (2016b) OEMP (refer Figure 1.1).

Site Occupancy

Prior to Occupancy:

- the Auditor's review of the compliance report required under the DEMP must be forwarded to the SLA for review and support
- application for variation to the Crown Lease under the Planning and Development Act 2007 must be requested and approved to include an additional provision which requires compliance with the SAS and OEMP
- a copy of the updated Crown Lease must be forwarded to the Authority for its records.

Following Occupancy:

The OEMP (or its revisions as approved by an SLA approved environmental Auditor and endorsed by the Authority) must be implemented at the site until such time that the OEMP is no longer deemed to be required, as determined by an Authority approved environmental Auditor and supported in writing by the Authority.

6.2 EMP Responsibilities

6.2.1 Responsibility for the SMP

The SMP (or its revisions as approved by an Authority approved environmental Auditor and endorsed by the Authority) must be implemented by the SLA or their authorised representative.

6.2.2 Responsibility for the DEMP

Following sale and up until the completion of development the implementation and ongoing management of the site in accordance with the DEMP is the responsibility of the land custodian of the site or their authorised representative.

6.2.3 Responsibility for the OEMP

The implementation and ongoing management of the site in accordance with the OEMP is the responsibility of the leaseholder or their authorised representative (body corporate).

6.3 Kingston Foreshore Development Precinct Site Wide Management Plan requirements

The SAR (Golder, 2021) notes the KFDP-wide SMP (Senversa, 2019) has been prepared to outline the required environmental management procedures and controls for intrusive works within the ACT Government owned or managed lands, such as roads, verges, parks, and open spaces within the Kingston Foreshore Development Precinct. The area currently subject to the KFDP-site wide SMP (Senversa 2019) does not include the former Kingston Powerhouse, Fitters Workshop and Associated Open Space within the Heritage Precinct of Section 49. The KFDP-site wide SMP (Senversa) applies immediately upon the initiation of construction / maintenance works which involve intrusive work.

Upon the completion of all development activities within the Audit site, the KFDP-wide SMP (Senversa 2019) may be updated to include land within the site boundary which will remain under ACT Government ownership and/or management. The updated KFDP-wide SMP must be reviewed by the Site Auditor to ensure it is adequate to protect site users and must be entered into upon agreement with a Site Auditor and the EPA. The KFDP-wide SMP would continue to operate *ad infinitum* unless the Auditor and EPA agree to allow changes in the application of the document.

Therefore, the KFDP-wide SMP may supersede the OEMP (WSP 2021c) for areas of the site which are subject to ongoing ACT Government ownership or management. Areas within the site subject to private lease(s) may continue to be managed under the OEMP (WSP 2021c) and OEMP must be updated concurrently with the KFDP-wide SMP to ensure that it is clear which areas are subject to the OEMP vs the KFDP-wide SMP. As stated in Section 13.3, any updates to the OEMP must be reviewed to validate the document remains adequate to protect site users and the updated OEMP will be entered into upon agreement with a Site Auditor and the EPA and will continue *ad infinitum* unless the Auditor and EPA agree to allow changes in the application of the OEMP.

6.4 DEMP requirements

The SAR (Golder, 2021) summarises the requirements of the DEMP (WSP, 2021b) which was prepared to manage known contamination risks and unexpected finds to which site users may be exposed to during the redevelopment of portions of the site. In accordance with the DSI (WSP 2021a) site redevelopment will exclude the former Kingston Powerhouse and Fitters Workshop, which will remain in their current configuration. The remaining portion of the site may be subject to the construction of new commercial buildings (which may include basements), and construction of new surface covering such as asphalt, stone pavers, timber decking and/or soft landscaping.

As redevelopment will occur in a staged manner across different portions of the site, the DEMP will only apply to the area under development. All other areas will remain under the SMP (Agon Environmental 2021).

Management measures described in the DEMP are summarised below.

6.4.1 Prior to the commencement of site development activities:

- The Contractor will develop a health and safety plan and induction processes to ensure construction workers are informed of anticipated site conditions associated with the development of the specific parcel.
- A suitably qualified environmental consultant and occupational hygienist will be engaged to manage environmental and contamination aspects of the construction works, monitor and evaluate work performance, and demonstrate compliance with this DEMP.

6.4.2 During development

During site development work the following hazard mitigation and control measures must be implemented:

- Site development works must be isolated from the general public.

Management of the site soils including:

- soils must be assumed to contain asbestos unless cleared by a Suitably Qualified Environmental Consultant (SQEC) to not contain asbestos
- site works must be staged to minimise the area of disturbed material at any one time
- soil excavated from the site must be managed, assessed, transported and disposed of in accordance with ACT guidelines and regulations
- material subject to off-site disposal must be assessed by a suitably qualified environmental consultant in accordance with "Information sheet 4 – Requirements for the reuse and disposal of contaminated soil in the ACT"
- soil tracking including a record of all soil entering and exiting the site must be implemented and maintained
- if importation of fill material is required, only Virgin Excavated Natural Material (VENM) as defined in "Information Sheet 10 - Virgin Excavated Natural Material (VENM)" is permitted to be imported to the site
- implementation of dust controls in association with all excavation works including wetting down excavation areas.

Where possible, excavated materials should not be stockpiled at site. If temporary stockpiling is necessary, stockpiles must:

- be covered due to the potential presence of asbestos
- have suitable erosion and sedimentation controls in place
- be removed as soon as practicable
- air monitoring for asbestos in accordance with ACT Work Safety (*How to Safely Remove Asbestos Code of Practice*) 2020 and *Guidance Note for Membrane Filter Method for Estimating Airborne Asbestos Dust*, 2nd Edition (National Occupational Health and Safety Commission 2005)
- any new sub-surface services required for the development are to be laid in a manner that permits safe access (i.e. a separation layer between contamination and the service)
- in the instance of aesthetically unsuitable materials being uncovered during development works, the material should either be retained under a separation layer, or be disposed off-site in accordance with ACT guidelines and regulations
- in the event of unexpected finds, work must stop immediately in the vicinity of the discovery, the area cordoned off, the Land Custodian informed, and a suitably qualified environmental consultant should assess the finds.

Where significant unexpected finds are found which may affect the suitability of the site for the land uses specified in the SAS or suitability of on-site reuse of soil, engagement with the Site Auditor is required. The Auditor must assess the findings of any assessment into the unexpected finds and make a determination as to whether the findings of the original audit still apply or if the soil is suitable for onsite reuse. The Auditors assessment in this regard must be forwarded to the EPA for its consideration. Where the unexpected finds is not deemed by the Auditor to affect the suitability of the site for the land uses specified in the site audit statement the suitably qualified environmental consultants validation report for the area of impact must be forwarded to the EPA for review and endorsement in accordance with EPA procedures.

If groundwater dewatering is required during site development:

- a groundwater management plan will be required for the purpose of outlining potential risks and mitigation for construction site workers and future site users
- the groundwater management plan must be reviewed and supported by an EPA approved contaminated land auditor prior to submission to the EPA for approval
- a suitably qualified environmental consultant must also be engaged to oversee the implementation of the groundwater management plan with their role including (but not limited to):
 - assessment of water quality during dewatering and advise on remediation and/or management options prior to off-site disposal
 - assessment of the potential risks to future site users from changes in vapour risks caused by dewatering activities.

Reporting requirements include:

- non-conformance and corrective actions must be reported to the Land Custodian by the Contractor

- inspection records must be documented and provided to the Land Custodian
- incident management reports must be undertaken by a suitably qualified environmental consultant
- a register of complaints must be maintained by the Land Custodian
- upon completion of the development works:
 - a suitably qualified consultant must be engaged to report of compliance with the DEMP
 - the Site Master Plan must be updated to show which areas of the site are subject to management under the SMP, DEMP and/or OEMP
 - the OEMP must be reviewed to evaluate if it is still suitable based on the development works undertaken at the site
 - in agreement with a Site Auditor and EPA the DEMP will cease, and the OEMP will be adopted as the appropriate management document for the site.

Specific protocols for the monitoring, management, excavation, transport, capping and use of materials on the site, including material separation requirements are also specified in the DEMP.

6.5 OEMP requirements

The OEMP (WSP 2021c) has been prepared to manage known contamination risks and unexpected finds to which future site occupiers, and/or maintenance workers may be exposed to during the normal operations of the site. In accordance with the DSI (WSP, 2021a) the site redevelopment will exclude the former Kingston Powerhouse and Fitters Workshop, which will remain in their current configuration. The remaining portion of the site may be subject to the construction of new commercial buildings (which may include basements), and construction of new surface covering such as asphalt, stone pavers, timber decking and/or soft landscaping. The OEMP will only apply to a portion of the site following redevelopment of that portion.

6.5.1 Ongoing management controls

Implementation of an Inspection and maintenance regime of the separation barriers present at site.

6.5.2 Management controls in association with intrusive maintenance activities

If sub-surface works are necessary for the ongoing operation of the site, the following management measures should be implemented:

- Prior to the commencement of maintenance activities, the Contractor must develop a health and safety plan and induction processes to ensure construction workers are informed of anticipated site conditions.
- The number and extent of areas subject to excavation works at any one time must be minimised.
- When excavation works are undertaken:
 - material is to be placed directly into a tipper truck and disposed of in accordance with ACT EPA guidelines (Information sheet 4 – Requirements for the reuse and disposal of contaminated soil in the ACT)
 - onsite stockpiling is not permitted

- on-site reuse of excavated materials is not permitted.
- If it is necessary to import fill material, only Virgin Excavated Natural Material (VENM) as defined in “Information Sheet 10 - Virgin Excavated Natural Material (VENM)” is permitted to be imported to the site.
- Implementation of dust controls in association with all excavation works including wetting down excavation areas.
- Air monitoring for asbestos in accordance with ACT Work Safety (How to Safely Remove Asbestos Code of Practice) 2020 and Guidance Note for Membrane Filter Method for Estimating Airborne Asbestos Dust, 2nd Edition (National Occupational Health and Safety Commission 2005).
- Upon completion of maintenance activities which involve excavation, the site surface is to be reinstated to the condition prior to excavation (i.e. sealed areas of the site must be re-sealed).
- In the event of unexpected finds, work must stop immediately in the vicinity of the discovery, the area should be cordoned off, the Land Custodian must be informed, and a suitably qualified environmental consultant should assess the finds.
- If groundwater dewatering is necessary during site occupation groundwater management plan will be required for the purpose of outlining potential risks and mitigation for construction site workers and future site users.
- The groundwater management plan must be reviewed and supported by an EPA approved contaminated land auditor prior to submission to the EPA for approval.
- As each section of the Site is redeveloped, a separation layer is to be installed, comprising:
 - concrete slab, roads, buildings or basement (overlying a geotextile marker where newly developed); or
 - a layer of clean fill of at least 0.5 m thickness overlying a geotextile marker, in areas not covered by buildings or other hard landscaping (i.e. concrete, paving, roads, etc). A clean fill layer of 0.5 m thickness is considered adequate based on the following:
 - The limited extent of contamination identified during investigations at the Site, indicating that the nature and extent of contamination at the Site is relatively localised.
 - The proposed land use where the separation layer will be installed comprises areas of open space, etc. where day-to-day activities would not require contact with soil at depths of more than 0.5 m.
 - A management plan (this DEMP and the future OEMP) are in place to control contact with potentially contaminated soils beneath the separation layer.
 - The proposed minimum thickness is consistent with the advice provided in *Guidelines for the Assessment of Onsite Containment of Contaminated Soil* (ANZECC, 1999).

A survey is required to confirm the required thickness of the separation layer. In addition, all new underground utilities are to be installed in trenches and be surrounded by at least 0.5 m of clean fill and a geotextile marker layer. The 0.5 m thickness may include the pavement/concrete.

The purpose of the separation layer is to protect future site users from contact with potential contamination (asbestos, metals, PAHs, hydrocarbons) in soil which has been observed to be present in localised pockets across the site. As the layout of the site landscaping and amenities is yet to be finalised, three separate designs have been provided below that can be adopted within the final site plans:

- Concrete Cap - will comprise a geotextile layer which will be overlain by clean soils and a concrete slab. This is the capping design relevant to building slabs, as well as concrete paving. Where installation of deeper utilities is required (e.g. new stormwater drainage), a trench should be dug to accommodate the deeper service which will be lined with geotextile marker layer and backfilled with clean sand
- Landscape / Living Turf Cap - Where a living turf surface is proposed, the design will comprise a geotextile layer, a layer of well sorted crushed stone / fine sand (minimum thickness of 25 mm), then an additional minimum 475 mm of VENM underlying the turf. Sufficient topsoil should be installed with the turf to ensure root growth. Where installation of deeper utilities is required (e.g. new stormwater drainage), a trench should be dug to accommodate the deeper service which will be lined with geotextile marker layer and backfilled with clean sand
- Tree Protection and Surrounds - Where existing trees are present, and removal of the tree is not suitable or desirable, the abovementioned capping designs cannot be implemented due to potential damage to the root system. However, a physical barrier / capping layer will still be required to remove exposure pathways to sensitive receptors. The goal of the barrier is to prevent all access to the contaminated soils from site users. To achieve this, the geotextile marker layer will underly a robust drainage mesh ('Global Synthetics Hydrocell' or similar) and a minimum of 100 mm of mulch. Alternatively, a minimum 300 mm layer of clean soil can be utilised with the drainage mesh omitted from the design.

Each of the capping options utilises a basal geotextile layer, comprise a permeable high visibility geotextile (for example 'Bidim A34' or equivalent) that will effectively prevent mixing of any overlying clean material / soils with underlying contaminated soil, or the migration or exposure of underlying contaminated soil to the surface.

Where installation of deeper utilities is required (e.g. new stormwater drainage), a trench should be dug to accommodate the deeper service which will be lined with geotextile marker layer and backfilled with clean sand.

Reporting requirements include:

- non-conformance and corrective actions must be reported to the Land Custodian by the Contractor
- inspection records must be documented and provided to the Land Custodian
- incident management reports must be undertaken by a suitably qualified environmental consultant
- a register of complaints must be maintained by the Land Custodian.

7 Closing

EMM has based this review on the SAR (2021) and SAS (2021) previously completed for the site and professional knowledge and judgement. EMM accepts no responsibility for errors or omissions arising from the previous investigations summarised therein. Based on the information reviewed the EMPs discussed herein are considered appropriate for implementation and management of the site during the construction and development phase of the KAP project subject to compliance with requirements and the Auditor's overall comments as detailed in the SAR and SAS.

EMM would be pleased to discuss any aspect of this review in more detail. Please contact the undersigned.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Anthony Davis', with a stylized flourish at the end.

Anthony Davis

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