POWERHOUSE PARRAMATTA
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX M
REMEDIAL ACTION PLAN

JBS&G

NSW GOVERNMENT

Infrastructure NSW
Remedial Action Plan

Powerhouse Parramatta
Phillip Street
Parramatta, NSW

3 April 2020

58352/128675 (Rev 0)

JBS&G Australia Pty Ltd

www.jbsg.com.au

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Abbreviations

A list of the common abbreviations used throughout this report is provided below.

ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
AF/FA	Asbestos Fines/Friable Asbestos
ASS	Acid Sulfate Soils
BaP	Benzo(a)pyrene
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
COPC	Constituent of Potential Concern
CSM	Conceptual Site Model
DA	Development Application
DoP	NSW Department of Planning
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objectives
EMP	Environmental Management Plan
ENM	Excavated Natural Material
ESL	Ecological Screening Levels
EPA	New South Wales Environment Protection Authority
GSW	General Solid Waste
ha	Hectare
HIL	Health-based Investigation Level
HSL	Health Screening Level
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
OCP	Organochlorine Pesticide
OEH	NSW Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photo-ionisation Detector
PPE	Person Protective Equipment
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan

REMP	Remediation Environment Management Plan
RPD	Relative Percent Difference
TEQ	Toxicity Equivalence Quotient
TRH	Total Recoverable Hydrocarbons
VENM	Virgin Excavated Natural material
VOC	Volatile Organic Compounds
WHSP	Work Health and Safety Plan

1. Introduction & Objectives

1.1 Introduction

JBS&G Australia Pty Ltd (JBS&G) was engaged by Infrastructure NSW (the client) to conduct a Detailed Site Investigation (DSI) of potential contamination at the proposed future location of the Museum of Applied Arts and Sciences (also referred to as the future Powerhouse Parramatta) at Philip Street, Parramatta NSW (the site). The total site is legally identified as Lot 1 and Lot 2 in DP1247122 and Lot 1 in DP128476 and occupies an area of approximately 2.5 hectares (ha). The site location and layout are shown on Figures 1 and 2, respectively.

The DSI has been prepared and issued as *Detailed Site Investigation Infrastructure NSW Museum of Applied Arts and Sciences, Philip Street Parramatta NSW*, 29 Match 2020, JBS&G Australia Pty Ltd (JBS&G 2020). JBS&G (2020) has identified contamination in soils that will pose a potential health and/or ecological risk under the proposed recreational / open space development if not appropriately remediated. Recreational open space land use criteria was considered to be the most appropriate as the proposed development includes multiple recreational areas openly accessible to the public, inclusive of adults and children. This document presents a Remedial Action Plan (RAP) to describe how the site can be made suitable for the proposed redevelopment.

This report further supports a State Significant Development (SSD) Development Application (DA) for the development of the Powerhouse Parramatta at 34-54 & 30B Phillip Street and 338 Church Street, Parramatta. The Powerhouse Parramatta is a museum (information and education facility) that has a capital investment value in excess of $30 million and as such the DA is submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). Infrastructure NSW is the proponent of the DA.

The Department of Planning, Industry and Environment (DPIE) have issued Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as issued for the management of site contamination issues.

The proposed scope of work presented in this RAP has been developed in general accordance with relevant guidelines made or approved by the NSW Environment Protection Authority (EPA).

1.2 Objective

The objectives of this RAP are to:

- Summarise the site characteristics;
- Define the extent of remediation required based on the proposed land use (a combination of open space / recreational and commercial / industrial land-uses are proposed with the redevelopment of the site);
- Identify the remedial strategy(ies) to be adopted by an assessment of remedial options and development objectives; and
- Document the procedures and standards to be followed in order to remove the risks posed by contaminated soils, to make the site suitable for the proposed future use as a Museum, while ensuring the protection of human health and the surrounding environment.

1.3 Scope of Works

The following scope of works are anticipated during the completion of remedial and validation works and as such are addressed within this RAP:

- Inspection, validation sampling and laboratory analysis of representative samples of fill materials, natural residual soil from the base and walls of remedial excavations associated with the identified lead, polycyclic aromatic hydrocarbon (PAH), polychlorinated biphenyl (PCB) and asbestos impacted soils;
- Validation that any soils remaining do not represent an aesthetics issue;
- Management and validation of any unexpected finds that may arise;
- Inspection, sampling and laboratory analysis of representative fill soil samples for material characterisation purposes to facilitate either off-site disposal and / or importation to the site;
- Review of material tracking documents and other relevant information collated by the remediation contractor during site activities; and
- Preparation of a report detailing the remediation/validation works in general accordance with relevant NSW EPA made or approved guidelines.

1.4 Overview of Proposed Development

The Powerhouse was established in 1879, and Powerhouse Parramatta will radically return to its origins through the creation of seven presentation spaces of extraordinary scale that will enable the delivery of an ambitious, constantly changing program that provides new levels of access to Powerhouse Collection. The Powerhouse will set a new international benchmark in experiential learning through the creation of an immensely scaled 360-degree digital space, unique to Australia.

Powerhouse Parramatta will reflect the communities and cultures of one of Australia's fastest growing regions. It will hold First Nations culture at its core and set a new national benchmark in culturally diverse programming. The Powerhouse will be highly connected through multiple transport links, and integrate into the fine grain of the city.

Powerhouse Parramatta will be an active working precinct and include the Powerlab, which will enable researchers, scientists, artists and students from across regional NSW, Australia and around the world to collaborate and participate in Powerhouse programs. The Powerlab will feature digital studios to support music and screen industries alongside co-working spaces, life-long learning and community spaces. Integrated into the Powerlab will be a research kitchen and library that will support a NSW industry development program including archives and oral histories.

This application will deliver an iconic cultural institution for Parramatta in the heart of Sydney's Central City. The SSD DA seeks consent for the delivery of the Powerhouse Parramatta as a single stage, comprising:

- Site preparation works, including the termination or relocation of site services and infrastructure, tree removal and the erection of site protection hoardings and fencing;
- Demolition of existing buildings including the existing Riverbank Car Park, 'Willow Grove', 'St George's Terrace' and all other existing structures located on the site;
- Construction of the Powerhouse Parramatta, including:
    - Seven major public presentation spaces for the exhibition of Powerhouse Collection;
    - Front and back-of-house spaces;

- Studio, co-working and collaboration spaces comprising the 'Powerlab', supported by 40 residences (serviced apartments) for scientists, researchers, students and artists artists, students, researchers and scientists, and 60 dormitory beds for school students;
- Education and community spaces for staff, researchers and the Powerlab residents, the community, and education and commercial hirers;
- Commercial kitchen comprising the 'Powerlab Kitchen' used for cultural food programs, research, education and events;
- Film, photography, and postproduction studios that will connect communities with industry and content that will interpret the Powerhouse Collection;
- Public facing research library and archive for community, industry, students and researchers to access materials; and
- A mix of retail spaces including food and drink tenancies with outdoor dining.

- Operation and use of the Powerhouse Parramatta including use of the public domain provided on the site to support programs and functions;
- Maintenance of the existing vehicular access easement via Dirrabarri Lane, the removal of Oyster Lane and termination of George Khattar Lane, and the provision of a new vehicular access point to Wilde Avenue for loading;
- Public domain within the site including new public open space areas, landscaping and tree planting across the site; and
- Building identification signage.

The project does not seek consent for the carrying out of works outside of the site boundary, and in particular does not involve any alterations to the existing edge of the formed concrete edge of the Parramatta River or to the waterway itself.

2. Site Condition & Surrounding Land Uses

2.1 Assessment Area Identification

The site location and the assessment area are shown in **Figures 1** and **Figure 2**, respectively. The site is located at the northern edge of the Parramatta CBD on the southern bank of the Parramatta River. It occupies an area of approximately 2.5 hectares and has extensive frontages to Phillip Street, Wilde Avenue and the Parramatta River. A small portion of the site extends along the foreshore of the Parramatta River to the west, close to the Lennox Street Bridge on Church Street. The site excludes the GE Office Building at 32 Phillip Street.

Assessment area details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1: Summary of Assessment Area Details

Lot/DP	Lot 1 and Lot 2 DP1247122, Lot 1 DP128476
Address	Philip Street, Parramatta
Local Government Authority	City of Parramatta Council
Approximate Area size	2.5 ha
Current Zoning	B4 Mixed Use, RE1 Public Recreation
Current Land Use	Carpark, commercial properties including restaurants and open space
Previous Land Use	Carpark since 1960s
Proposed Land Use	Open Space / recreational – Powerhouse Parramatta plus open space areas for public access

2.2 Site Description

A detailed inspection of the assessment area was conducted on 28 February 2020 by one of JBS&G's trained and experienced environmental scientists. Observations of the current site configuration and potential areas of concern are discussed below.

The site is currently occupied by a number of buildings and structures, including:

- Riverbank Car Park – a four-level public car park;
- Willow Grove – a two-storey villa of Victorian Italianate style constructed in the 1870s;
- St George's Terrace – a two-storey terrace of seven houses fronting Phillip Street constructed in the 1880s;
- 36 Phillip Street – a two-storey building comprising retail and business premises;
- 40 Phillip Street – a two-storey building comprising retail and business premises; and
- 42 Philip Street – a substation building set back from the street.

The immediate context of the site comprises a range of land uses including office premises, retail premises, hotel, serviced apartments and residential apartments. To the north is the Parramatta River and open space corridor, beyond which are predominately residential uses. The Riverside Theatre is located to the north-west across the Parramatta River.

Two ground-level asphalt carparks situated to the south of the Riverbank Car Park and were divided by an open-space, private parkland and Willow Grove and St George's Terrace. Small landscaped areas consisting of vegetation and patchy grass/exposed soils were also situated at various locations throughout both carparks. A number of private carparks were also situated at the rear of the commercial properties along Phillip Street, with surface compositions comprising patchy asphalt and gravelled exposed soils.

Directly to the north of the commercial properties, Oyster Lane and George Khattar Lane merge and slope downwards in a northerly direction towards Parramatta River and to the east of the Riverbank

Car Park. A landscaped area comprising large trees and grass also exists between George Khattar Lane and Riverbank Car Park.

2.3 Surrounding Land Use

The land uses surrounding the proposed Powerhouse Parramatta have been identified as follows:

- North – Parramatta River, River Foreshore Reserve, high density residential apartments, Riverside Theatres and low-density residential housing;
- East – Wilde Avenue, commercial properties including restaurants and open parkland;
- South– Multistorey GE office building, Phillip Street, commercial estates including restaurants followed by George Street; and
- West – High density residential apartments, commercial estates such as Bondi Pizza Parramatta.

2.4 Topography

A review of topographic information obtained from proposed plan packages[1] indicated that the southern portion of the site lies at an elevation of approximately 7.5 m Australian Height Datum (AHD) and falls towards the north/Parramatta River with a final elevation of approximately 2.1 m AHD. The elevation is relatively consistent at approximately 7.5 m AHD from west to east.

2.5 Geology and Soils

Review of the 1:100 000 scale Sydney Geological Sheet Series 9130 (NSW DMR 1983[2]) indicates that the site is located on the Wianamatta Group Shale, consisting mostly of shale, carbonaceous claystone, laminate, fine to medium grade lithic sandstone. Previous investigations (see **Section 4.1**) reported fill over natural soils as silty sand/silty clay overlying sandstone.

Review of the NSW Department of Environment and Heritage online resource eSPADE[3], indicated the site overlies the Birrong Soil Group which comprises deep (>250 cm) *Yellow Podzolic Soils* on older alluvial terraces, deep (>250 cm) Solodic Soils and Yellow Solonetz on the current floodplain. The soil landscape is prone to localised flooding and presents a high soil erosion hazard. Furthermore, the Birrong Soil Group can be characterised as saline subsoil with very low soil fertility and seasonal waterlogging.

2.6 Hydrology

The majority of surface area at the site is sealed concrete or asphalt. It is assumed that precipitation will migrate through municipal stormwater infrastructure and subsequently discharge to Parramatta River or north, downgradient towards Parramatta River.

1 200402 SSDA Package, Moreau Kusunoki and Genton Architects, Powerhouse Parramatta, Rev 3.
2 *Sydney 1:100,000 Geological Sheet 1930, 1st Edition*. NSW Department of Mineral Resources 1983 (NSW DNR 1983)
3 *eSPADE* https://www.environment.nsw.gov.au/eSpade2WebApp# NSW Department of Environment and Heritage. Accessed 5 March 2020

2.7 Hydrogeology

Registered bore information has been obtained from the Water NSW online database (WNSW[4]). The search identified four groundwater bores located within a 1 km radius of the site and are summarised following.

Table 2.2: Registered Groundwater Bore Search Summary

Bore Number	Approximate distance from site (km) and Eastings/Northings	Intended Use	Drilled depth (m bgs)	Standing Water Level (m bgs)	Geological Material
GW108611	0.46 E: 315129 N: 6257213	Water Supply	60.50	6.2	Fill to 1.00 m bgs, clay to 3.00 m bgs, shale to 5.50 m bgs, sandstone to 60.50 m bgs.
GW110912	0.66 E: 315997 N: 6257285	Exploration	10.00	7.0	Concrete to 0.10 m bgs, silty clay fill to 0.20 m bgs, natural sandy grey clay to 3.50 m bgs, clay with shale to 4.30 m bgs, shale to 6.80 m bgs, sandstone to 10.00 m bgs.
GW110913	0.66 E: 315992 N: 6257267	Exploration	10.00	7.0	Concrete to 0.10 m bgs, silty clay fill with gravel to 0.50 m bgs, natural red-brown sandy clay to 4.50 m bgs, clay with shale to 4.90 m bgs, sandstone to 4.90 m bgs, sandy clay with shale to 6.00 m bgs, sandstone to 10.00 m bgs.
GW110914	0.66 E: 315973 N: 6257260	Exploration	6.0	5.0	Silty sand fill to 0.20 m bgs, sandy clay fill to 1.10 m bgs, natural sandy clay to 2.50 m bgs, red clay to 5.00 m bgs, siltstone and shale to 5.50 m bgs, sandy clay to 5.50 m bgs, sandstone to 6.00 m bgs.

Based on the information obtained from groundwater bores and the mapped geology of the site, it is anticipated that shallow groundwater is encountered at the interface of residual soils and bedrock at greater than 5 m depth apart from the area immediately adjoining the Parramatta River. Based on the location of the site and local topography, the inferred groundwater flow direction is north towards Parramatta River.

2.8 Acid Sulfate Soils

Review of the Acid Sulfate Soil Risk Map (NSW DLWC)[5] indicates that the site is located within an area of Disturbed Terrain which includes areas historically impacted by reclamation of low-lying wetlands, dredging, mining or urban development. The nearby Parramatta River comprises an area of high probability of acid sulfate soil occurrence in bottom sediments. Acid Sulphate Soils are anticipated to be present underlying the site at depth.

[4] *Water New South Wales*, http://realtimedata.waternsw.com.au, accessed 26 March 2020.
[5] *'Acid Sulphate Soil Risk Map – Prospect-Parramatta,* 1997 1:25 000 (NSW DLWC)

2.9 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Bankstown Airport) indicates that the site is located within the following metrological setting:

- Average minimum temperatures vary from 4.5°C in July to 16.7°C in January;
- Average maximum temperatures vary from 17.5°C in June to 28.1°C in January;
- The average annual rainfall is approximately 914 mm; and
- Monthly rainfall varies from 51.4 mm in September to 99.1 mm in March with the wettest periods occurring on average in February, March and April.

3. Site History and Previous Environmental Assessments

3.1 Site History

A detailed assessment of the site history has been prepared and presented in JBS&G (2020). The site has been found to have been subject to development prior to 100 years ago. Previous land-uses have typically comprised residential and/or commercial land-uses as consistent with the historical evolution of the Parramatta Central Business District. No readily identifiable and/or potentially contaminating activities have been identified as shaving been historically undertaken on the site. However a range of potential sources of contamination were identified as described in the following section.

3.2 Potential for Contamination

Further to the assessment of site history, and a detailed inspection of the site, potential sources of contamination were considered to most likely include:

- A range of contaminants as potentially present in historical imported fill materials that are likely to have been used through the historical development of the site. Based on the site locality within the Parramatta area, and typical historical industries in proximity (and known historical sources of filling), potential contaminants would more likely include asbestos, PAHs and heavy metals;
- Likely historical use of lead-based paints on historical structures across the site. Associated flaking lead paint and distribution of paint chips can cause impacts to near surface soils, found to be present as fill materials across the site extent;
- Potential point source contamination at 42 Philip St as associated with the historical use of this site as an electrical substation. Potential localised contaminants may include PCBs as associated with historical dielectric fluids, and/or semi- and non-volatile petroleum hydrocarbons used as coolants / lubricants; and
- Potential localised sources of petroleum hydrocarbon-based contaminants, or otherwise volatile organise compounds, as may occur with potential historical localised usage of organic liquids, fuels, oils, lubricants, solvents etc.

The actual presence of these contaminants has been assessed by a range of previous environmental assessments as detailed in **Section 4**.

4. Extent of Contamination

4.1 Previous Investigations

The following environmental assessment reports prepared for the site were reviewed and are summarised in the following sections:

- *Preliminary Environmental Site Assessment for Proposed Mixed Use Development at Riverbank Square, 30B Phillip Street, Parramatta*, 28 October 2013, Environmental Investigation Services Pty Ltd, (EIS 2013);
- *Preliminary and Detailed Site investigation, 42 Phillip Street, Parramatta, NSW, Endeavour Energy*, 4 May 2016, JBS&G Australia Pty Ltd (JBS&G 2016a);
- *Preliminary Site Investigation, Proposed Museum of Applied Arts & Sciences, Parramatta, NSW, Pells Sullivan Meynink*, 1 September 2016, JBS&G Australia Pty Ltd (JBS&G 2016b); and
- Detailed Site Investigation (JBS&G 2020).

The findings of each assessment are summarised in the following sections.

4.1.1 Preliminary ESA (EIS 2013)

A Phase 1 Environmental Site Assessment was completed on a portion of the site by Environmental Investigation Services on 28 October 2013 (EIS 2013) for City of Parramatta Council. This assessment was conducted in order to determine the suitability of a portion of the current proposed site for a proposed mixed-use development. The portion assessed included the foreshore area, multi-storey and ground level parking areas and the Phillip Street and Wilde Avenue access ways. The findings of the assessment are summarised below:

- Fill materials in the foreshore area were observed to include some anthropogenic materials in the fill profile, including ash at location (BH2). Fill was underlain by silty sand and silty clay overlying sandstone. Sandstone was encountered between 3 m and 9.5 m depth. Seepage water was noted between 4 and 6 m within boreholes south of the car park, and between 1.5 and 2 m in the foreshore area;
- PAHs reported as benzo(a)pyrene B(a)P toxicity equivalent quotient (TEQ) were reported at one location (BH2) exceeding the adopted human health criteria concentration of 3 mg/kg, as located in the foreshore area in the northwest of the site. These concentrations were equivalent to or above the adopted NEPC (2013) health-based investigation level (HIL) of 3 mg/kg and further exceeded the adopted ecological screening level (ESL);
- Toxicity characteristic leaching procedure (TCLP) results for B(a)P in samples from BH2 indicated that B(a)P was not leaching. This is consistent with the presence of ash materials identified by EIS in fill at BH2, whereby PAHs are bound into the ash material and 'naturally' immobilised;
- Elevated concentrations of nickel (37mg/kg) and zinc (320mg/kg) were encountered above the adopted ecological investigation levels (EILs) at two locations within the foreshore area. It is noted the consultant did not derive site-specific EILs for these metals, and so the assessment is likely conservative;
- Results indicated that deep penetration of the soils (greater than 5 m bgs) may result in the generation of potential ASS. Shallower soils at locations BH2 and BH4 (foreshore) were also found to be acidic following oxidation, although results were below the adopted ASS action criteria; and
- The results of the groundwater assessment on two samples were reported by EIS as being less than the adopted criteria, including hardness modified trigger values. A trace

concentration of light fraction total petroleum hydrocarbon (TPH C6-C9) was encountered in the MW1 sample. EIS consider that this is likely to be the result of small surficial spills in the car park area.

4.1.2 PSI and DSI for Substation at 42 Philip St (JBS&G 2016a)

JBS&G was engaged by Endeavour Energy to provide a Preliminary and Detailed Site Investigation (PSI-DSI) for a cottage substation located at 42 Phillip Street, Parramatta. The objectives of the PSI/DSI were to assess potential contamination associated with use of the site as a substation and to determine the suitability of the site for land uses permitted under the zoning B4 Mixed Use. Based on the results of the investigation, the following conclusions were made:

- There were potentially unacceptable risks from B(a)P, lead and asbestos contaminated soils with respect to the proposed commercial/industrial land use;
- Asbestos impacts in soils were restricted to the upper 0.5 m of fill material;
- B(a)P and lead impacted material at the site was not subject to leaching under neutral conditions and migration of lead and B(a)P contamination to groundwater was therefore considered unlikely; and
- It was considered that the site could be made suitable subject to further investigation and/or management.

4.1.3 Preliminary Site Investigation (JBS&G 2016b)

JBS&G was engaged by Pells Sullivan Meynink to provide environmental consulting services in relation to the completion of a Preliminary Site Investigation (PSI) of the area for the proposed Museum of Applied Arts and Sciences (MAAS) development in Parramatta, NSW in 2016. The investigation reported the following:

- Historical uses and activities on the site have the potential to have resulted in contamination, particularly from filling to raise site levels, predominantly along the foreshore area and where former structures have been demolished;
- Intrusive investigations identified the presence of elevated PAHs (and minor TRH) in fill material at levels exceeding open space land use criteria. The PAHs/TRH were considered to be associated with materials in the fill including ash and charcoal and asphaltic materials in shallow fill below car park areas;
- PAHs did not appear to be contaminated to unacceptable levels as a result of activities or conditions at the site;
- There was reported to a low likelihood of contaminants in fill migrating from the site via groundwater;
- No asbestos containing materials were observed or reported during the investigation. However, soil investigations were completed using boreholes to minimise disturbance of site surfaces and it was acknowledged that during bulk excavations, other materials in fill not observed during the investigation could be encountered;
- PASS conditions did not appear to be present in fill or shallow soils. However, it was noted that deeper soils (>7 m) may require ASS management if disturbed; and
- It was reported that not all areas were accessible during the investigation and remained subject to future environmental assessment.

4.1.4 Detailed Site Investigation (JBS&G 2020)

JBS&G was engaged by Infrastructure NSW to undertake a detailed site investigations. These works were undertaken by additional sampling and analysis of soils and groundwater to address each of the areas not otherwise addressed by the earlier assessments, or to otherwise provide an even distribution of sampling locations across the site. All data, as across each investigation phase, was collated in this assessment and assessed against the extent of the proposed Powerhouse development. It has been reported:

- Elevated levels of heavy metals were present in soils across the site, as likely exceeding the lowest of ecological based criteria that may be derived. Apart from lead, these levels of soil impact were considered to be consistent with anticipated levels in a historically urbanised area and not considered to pose a potential ecological risk in respect of the proposed development of the site;
- An assessment of groundwater was undertaken by a comparison of levels of environmental constituents present in hydrogeologically upgradient and downgradient monitoring wells. Levels of environmental constituents were found to be consistent with anticipated levels within an historically urbanised area, and further there was no indication of a site-specific source of groundwater impact;
- Levels of PAHs including benzo(a)pyrene (TEQ), lead, PCBs and asbestos were identified in areas of isolated hotspots at levels that exceeded assessment criteria adopted for an open space / recreational land-use. These impacts were associated with constituents present in fill materials on the site, and were generally restricted to shallow depths, as consistent with the vertical extent and historical placement of imported fill materials on the site; and
- It was recommended that remediation and/or ongoing management works would be required to address the contaminated soils as identified on the site.

4.2 Extent of Contamination

On the basis of the investigations completed to date, and consistent with the extent of impact as shown on **Figure 4**, several locations have been identified with elevated levels of soil constituents that exceed adopted assessment criteria. Contaminants have been identified as typically non-volatile constituents including carcinogenic PAHs (characterised as benzo[a]pyrene equivalents), PCBs, lead and asbestos. The chemical based constituents are characterised as posing a potential health risk by direct contact exposure pathways. Asbestos will pose a potential health risk by potential inhalation of asbestos fibres. Similarly to the other constituents as requiring to be addressed on the site and identification of potentially complete exposure pathways, soils require to be exposed for potential release of asbestos fibres to occur.

Areas of criteria exceedances from the extent of previous investigations are shown on **Figure 4** as specific to the sample location where the impact has been identified. Each of the 'hot-spots' of soil contamination is discussed following:

- North-western corner of site at EIS (2013) sample location BH2. Impact here consists of elevated levels of benzo(a)pyrene (TEQ) which have slightly exceeded the adopted health-based criterion in soils at a depth of 1.5-1.95 m, with exceedances of the ecological criterion for soils at a depth of 0.5-.95 and 1.5-1.95 m;
- Northern portion of site at JBS&G (2016b) sample location BH6. Impact here consists of elevated levels of benzo(a)pyrene (TEQ) which have slightly exceeded the adopted health-based criterion in soils at a depth of 1.2-1.3 m, with a slight exceedance of the ecological criterion for soils at a shallower depth of 0.3-0.4 and each of deeper depths assessed;

- Central portion of site at JBS&G (2016b) sample location BH3. Impact here consists of elevated levels of benzo(a)pyrene as reported at the near surface depths of 0.15-0.25 and 0.4-0.5 m. Impact here is associated with fill materials which have been reported to a depth of 0.5 m bgs;
- Eastern portion of site at JBS&G (2020) sample location SB12. Impact here consists of elevated levels of benzo(a)pyrene as reported at the near surface depths of 0.2 m at SB12. Impact here is associated with fill materials which have been reported to a depth of 0.4 m bgs; and
- South-eastern portion of site at previous sample locations JBS&G (2016a) HA01 to HA04 and JBS&G (2020) MW01 and SB13. Impact across these locations has been reported to consist of elevated levels of lead, benzo(a)pyrene and PCBs. A localised hot-spot of asbestos fines has also been reported in near surface soils at sample location HA01 within this overall hotspot. Impact is associated with fill materials which are not found to exceed a depth of 0.5 m. An increased frequency of anthropogenic materials has also been reported in soils in this area of the site, with inclusions of bricks, tiles, terracotta building materials etc.

5. Remedial Options

5.1 Extent of Remediation

As discussed in **Section 4.2**, impacted fill materials require remediation / management for the site to be considered suitable for the proposed land use. Areas of impact as proposed for remediation are shown on **Figure 5** as specific to the sample location where the impact has been identified. Remedial works are considered to be required at three of the hot-spot areas as identified with exceedances of the adopted assessment criteria in JBS&G (2020) and **Section 4.2**. Each of the hot-spots as nominated for remediation include:

- Central portion of site. Fill based soils as impacted with PAHs / benzo(a)pyrene and present over an area of approximately of 300 m^2 with impacted fill based soils present to an anticipated depth of 0.5 m. A volume of approximately 150 m^3 of soils requires remediation from this area
- Eastern portion of site. Fill based soils as impacted with PAHs / benzo(a)pyrene and present over an area of approximately of 250 m^2 with impacted fill based soils present to an anticipated depth of 0.4 m. A volume of approximately 100 m^3 of soils requires remediation from this area; and
- South-eastern portion of site. Fill based soils as impacted with PAHs / benzo(a)pyrene, lead, PCBs and asbestos. The asbestos is restricted to a localised area within the overall hot-spot as located in the central portion of the Energy Australia property. This hot-spot is estimated at a diameter of 10 m and to a depth of 0.5 m (25 m^3 of soils). The extent of impacted soils at this portion of the site (including the localised area of asbestos impact) is present over an area of 1500 m^2 and to a typical depth of 0.5 m. It is estimated that approximately 750 m^3 of soils require remediation here.

It is noted that no remediation was required at the north-western corner of the site (EIS 2013 BH2 and JBS&G 2016b BH6)) as levels very slightly exceeded the adopted assessment criteria, and were present at a depth where recreational and/or ecological exposures were considered unlikely. Upper depth soils at this location did not exceed the adopted criteria, or in the case of BH6 only very slightly exceeded the ecological criteria. A range of guidance documents have been published subsequent which demonstrate the benzo(a)pyrene ecological criterion to be highly conservative, as discussed in JBS&G (2020).

Notwithstanding the three identified hot-spots, and PAH impacts present at depth at the north and north-west of the site, JBS&G (2020) reported several minor exceedances of potentially applicable ecological criteria throughout fill based soils on the site. It is further observed that substantial area of open space and landscaping are proposed with the site development, as shown on **Figure 5**. While the levels of environmental constituents indicate a potential that these soils may not be suitable for landscaping, there is no evidence of ecological stress on the site, and it is further acknowledged that specialised growing media will be imported with the site development to form the areas of specialised landscaping. No remedial works are identified as required for these areas.

5.2 Remedial Objectives

The remediation objectives are as follows:

- Removal of potentially unacceptable risks to human health and the environment and aesthetic issues associated with the identified lead, PAH, PCB and asbestos impacts, relating to the proposed recreational / open space land use;
- Addressing any unexpected finds as may arise during the remedial works;
- Validate the remedial works in accordance with the relevant NSW EPA guidelines and with reference to the RAP requirements; and
- Document the validation process.

This RAP has been prepared with reference to the following guidelines:

- *Managing Land Contamination, Planning Guidelines, SEPP 55 – Remediation of Land*. Department of Urban Affairs and Planning 1998 (DUAP 1998);
- *Sampling Design Guidelines*. NSW EPA 1995 (EPA 1995);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*. NSW Office of Environment and Heritage 2011 (OEH 2011);
- *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition)*. NSW Environment Protection Authority 2017 (EPA 2017);
- *National Environment Protection (Assessment of Site Contamination Measure) Measure 1999 (As Amended 2013)*. National Environment Protection Council (NEPC 2013);
- *Code of Practice for the Safe Removal of Asbestos, 2nd Edition.* National Occupational Health and Safety Commission, April 2005 (NOHSC 2005); and
- *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia*. Environmental Health Directorate, May 2009 (DOH 2009).

5.3 Consideration of Possible Remedial Options

The preferred hierarchy of options for remediation (clean up) and/or management adopted by NSW EPA has been established within the NEPC (2013) Assessment of Site Contamination Policy Framework as follows:

- On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level; and
- Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site; or

  If the above options are not practicable:

- Consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill; or
- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

In addition, when deciding which option to choose, consideration is also required to be given to the sustainability (environmental, economic and social) aspects of each option to ensure an appropriate balance between the benefits and effects of undertaking remedial/management options.

In cases where no readily available or economically feasible method is available for remediation, it may be possible to adopt appropriate regulatory controls or develop other forms of remediation.

Consideration of each of the approaches (EPA 2017), is presented in **Table 5.1.**

5.4 Preferred Remedial Strategy

With consideration to established hierarchies for soil remediation options, and to the site specific contaminants and proposed environmental setting as detailed throughout **Table 5.1**, the preferred strategy for remediation of the soil contamination is excavation and off-site removal of the material to a licensed waste facility.

This is the preferred strategy given the absence of on-going management requirements, low site works costs (other than disposal fees), and is considered the most suitable method for removing potentially unacceptable contamination risks at the site to facilitate likely future development.

The proposed implementation of this remediation method is described in **Section 6**.

Table 5.1 Remedial Options

Remediation Methodology	Description	Suitability
Option 1: On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level**.**	PAHs and PCBs present in site soils are typically restricted to heavier non-volatile constituents. These can be remediated by thermal processes. However, this requires substantial investment in plant and equipment and substantial energy use. Bioremediation techniques could also be completed (pilot trial would likely be required for effectiveness of PAHs and PCBs), however this requires large portions of land and significant timeframes. Bioremediation techniques would not be anticipated to be applicable / likely to be succesful to PCB contaminants identified. Heavy metal impact in soils, consisting of lead impacts are typically not able to be treated. A range of experimental processes are available, such as soil washing etc but these are not typically viable for commercial scale application. Similarly there are no known treatment methodologies to cause the removal of asbestos fibres from soils. There are a number of microencapsulation treatment technologies which can reduce the mobility of the identified inorganic and organic contaminants of concern (e.g., cement stabilisation), but these technologies still retain the presence of the contaminant. These methods further require proof-of performance to ensure contaminant is effectively immobilised long-term and would result in presence of additional materials on-site (e.g. concrete) that may not be appropriate for the sensitive land use or otherwise in open space / recreational / landscaped areas.	Not a suitable option. Not cost effective for the small volume of material involved. Limited site space to complete on-site treatment. Timeframes unsuitable given need to prove long-term stabilisation. Mix of contaminants would require different treatment techniques, and some contaminants present do not have readily available treatment techniques available.
Option 2: Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site.	PAH and PCBs present in site soils are typically restricted to heavier non-volatile constituents. These can be remediated by thermal processes. However, this requires substantial investment in plant and equipment substantial energy use and an appropriately licensed facility. Bioremediation could potentially occur off-site, however would likely require a significant timeframe and the presence of PCBs is likely inconsistent with bioremediation processes. No known facilities are present off-site which can treat soils to cause the removal of heavy metals (including lead) contaminants. As with heavy metals, there are a number of microencapsulation treatment technologies which can reduce the mobility of the identified organic contaminants of concern (e.g., cement stabilisation) however may not be appropriate for the sensitive land use. The material would further require to be immobilised off-site, and then returned to site in the immobilised state.	Not a suitable option. Lack of off-site thermal treatment facilities to perform the treatment cost-effectively. Bioremediation off-site may be limited due to concentrations of heavy metals, PCBs and asbestos within the soil. Energy / resource use associated with the transport and return of materials is not considered cost effective.

Remediation Methodology	Description	Suitability
Option 3: Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill	Short remediation time – impacted material removed immediately. No on-site storage or treatment issues. Minimal design and management costs. No ongoing management requirements. Ideally suited to small volumes, but can also be suitable for larger volumes, and where there are short timeframes, material space/volume constraints, and where sensitive end land use is more achievable with impact being removed from the site entirely.	Preferred option due to short timeframe, site/space constraints and no ongoing management which may restrict the proposed future development.
Option 4: Consolidation and isolation of the soil on-site by containment within a properly designed barrier.	The soil based on previous investigations are not considered to pose an inhalation risk due to the presence of vapours and is not considered to pose a risk to the underlying groundwater. Exposed soils would pose a potential inhalation risk by release of asbestos fibres, but capping of soils as may be undertaken with a consolidation and isolation approach would control this risk. Contaminated soils would be most appropriately consolidated to a single area of the site and contained / isolated within this location. Capping would require to be provided over this area, varying in depth dependent on what the overlying land-use was. Where consolidation occurred under a building, it would be required to be ensured that the materials was consolidated in a geotechnically suitable manner. Where consolidation occurred in landscaped / open space areas, a potentially substantial depth of capping soils would be required to ensure no future exposure by gardeners / landscape workers etc. On site consolidation would require public notification and enforcement mechanisms, which can influence perceptions of the appropriateness of land for use as a public utility.	Not a preferred option as retention and notification of contamination is not considered consistent with the proposed open space / recreational land-use proposed for the site. Further, the total volume of soils requiring remediation is not substantial, and is considered to be more appropriately addressed by removal of the hazard.

6. Remediation Plan

6.1 Regulatory and Planning Requirements

This RAP has been prepared with reference to the following guidelines and legislation.

Environment Planning and Assessment Act 1979 / SEPP 55

Development consent for the remedial works will be granted as part of the overall project consent approval through the State Significant Development approval process.

Notification of remediation works will be required to be given to council at least 30 days prior to commencement, and council requires notification within 30 days from completion of remediation works, consistent with SEPP 55 requirements.

This will be addressed with the Environmental Impact Statement (EIS) documentation as being prepared for the works.

Environment Planning and Assessment Regulation 2000 – Schedule 3 Designated Development

It is anticipated that the proposed remediation works will not incorporate any on-site treatment to reduce the concentrations of contaminants within the soil. However, in the event that soil is required to be pre-treated to reduce the concentrations of contaminants prior to off-site disposal, an assessment of potential triggers for the works to be designated development as presented in Schedule 3 – Clause 15 will be required to be completed.

Protection of the Environment Operations Act 1997

The proposed remediation / validation activities are not required to be licensed under the *Protection of the Environment Operation Act 1997*.

Water Management Act 2000

While groundwater may be intercepted during remediation works, dewatering is not anticipated. Notwithstanding the aforementioned, should groundwater dewatering be identified as necessary, a dewatering license will be obtained from the NSW Department of Primary Industry – Water (DPI). The approval will require to be obtained prior to the undertaking of any groundwater dewatering and treatment.

If rainwater and associated seepage accumulates at the site and requires dewatering, permission should be sought from the local council and criteria met prior to the release of the water into stormwater assets.

Protection of the Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The proposed works on the site are not required to be licensed. Section 48 of the Regulation requires that wastes are stored in an environmentally safe manner. It is also stipulated that vehicles used to transport waste must be appropriately licensed and covered when loaded with impacted materials. For transport activities following 1 July 2016 this regulation also details additional tracking requirements for vehicles carrying Special (asbestos) waste if material is identified to contain asbestos following waste classification activities.

Provision is provided in the Regulation and EPA (2014) guidelines for the NSW EPA to approve the immobilisation of contaminants in waste (if required with unexpected finds).

Waste Classification Guidelines (EPA 2014a)

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

NSW Work Health and Safety Regulation 2017

Works undertaken at the site are to be completed in accordance with the NSW Work Health and Safety Regulation (2017). Specific regulations, as are applicable to the remediation action plan, are documented within relevant sections herein.

Asbestos Removal and Management

The removal and disposal of asbestos will be managed in accordance with the *Work Health and Safety Act (2011)* and *Work Health and Safety Regulation (2017)*, *How to Safely Remove Asbestos: Code of Practice* (WorkCover 2019), *How to Manage and Control Asbestos in the Workplace Code of Practice* (WorkCover 2019), the NSW WorkCover Guidelines, the NSW EPA (2014) *Waste Classification Guidelines*, and requirements under the *Protection of the Environment Operations (Waste) Regulation (2014)* for asbestos waste monitoring (NSW EPA 2015).

A licensed asbestos removalist and WorkCover notification regarding the scope of the removal works is required. It will be the requirement of the appointed civil works contractor to obtain the appropriate approvals (as outlined in **Section 6.2**) and prepare an Asbestos Management Plan (AMP) as consistent with applicable SafeWork guidances.

6.2 Approvals, Licences and Notifications

Development approval through the works will be facilitated through the Environmental Impact Statement being prepared for the overall development.

The identified asbestos includes friable asbestos, as per the definitions in relevant regulatory guidance. In accordance with Safe Work Australia guidance, excavation and removal of asbestos fibre contaminated soils are required to be conducted by a Class A licensed contractor.

Before starting the works, the appointed Specialist Contractor (civil works contractor) is required to obtain a site-specific permit approving the asbestos works from SafeWork NSW. A permit will not be granted without a current licence and the permit application must be made at least seven days before the work is due to commence.

Remediation works shall not commence until all required approvals, licences and notifications have been granted and/or received.

6.3 Site Establishment

The potential extent of remediation is summarised in **Section 5.1** and shown on **Figure 5**. The remedial contractor shall secure the site to ensure that all safety and environmental controls are implemented. These controls will include, but not be limited to:

- Locate and isolate all required utilities in the proximity of the works;
- Assess need for and implement any necessary traffic controls;
- Work area security fencing;
- Site signage and contact numbers, including asbestos warning signage at the south-east of the site;
- Stabilised site entry gate;
- Appropriate decontamination areas for personnel and plant, if required;

- Sediment fencing (attached to security fencing); and
- Stormwater runoff and sediment controls (e.g. silt fences and hay bales).

6.4 Remedial Works

Areas requiring remediation are discussed in **Section 6.1** and shown on **Figure 5**. The extent of remedial works shall address two hot-spots as identified within the site. This shall be further inclusive of a small sub-area of impact within the large hot-spot at the south-east of the site. The extent of the works is described following:

- Initial excavation of the friable asbestos / asbestos fine impacted soils from the proximity of JBS&G (2016a) sample location HA01 at an extent of a 5 m radius outwards from the sample location and to a depth of 0.5 m, or otherwise natural soils (whichever is shallower). Completion of works under controlled asbestos works conditions;
- Excavation of the remaining hot-spot at the south-east of the site, as shown on **Figure 5**. Excavation of soils to a depth of 0.5 m, or otherwise natural soils (whichever is shallower);
- Excavation of hot-spot at the eastern portion of the site, as shown on **Figure 5**. Excavation of soils to a depth of 0.4 m, or otherwise natural soils (whichever is shallower);
- Excavation of hot-spot at the central portion of the site, as shown on **Figure 5**. Excavation of soils to a depth of 0.5 m, or otherwise natural soils (whichever is shallower);
- Disposal of soils as per waste classifications as specific to each of the soil types, anticipated to be separately stockpiled as asbestos and non-asbestos impacted soils; and
- Validation of the extent of excavations and removal of levels of lead, PAHs, PCBs and asbestos to levels which do not pose a health risk.

6.4.1 Heritage Issues

Heritage structures are present on the site and will be demolished as part of the project. Remedial works are shown in proximity of known heritage structures. It is considered that remedial works will extend to underlying the heritage structures. Site based contaminants are typically associated with imported filling. Heritage structures have been on-site for a substantial period of time, and it is unlikely that fill imported under the structures would have been impacted with off-site industrial processes, at the time of impact.

However, if remedial works require to extend beneath the heritage structures, this will be conducted following demolition.

6.5 Asbestos Management Requirements

Based on the available characterisation information as discussed in **Section 5**, a small area of fill materials within the site are impacted with asbestos, and are classified as asbestos contaminated soils. Asbestos contaminated soil necessitating management for potential asbestos exposure is defined in *How to Manage and Control Asbestos in the Workplace Code of Practice* (SWA 2019) as:

- Soil that contains visible asbestos as determined by a competent person; or
- Soil that contains asbestos fibres at quantities exceeding trace levels (considered to be the analytical detection limit in lieu of alternate guidance) as reported by analysis undertaken in accordance with AS4964:2004 Method for the qualitative identification of asbestos in bulk samples.

Environmental, health and safety management requirements for the handling of these materials will be documented in an Asbestos Management Plan (AMP) as required to be prepared by the civil works contractor and based on the requirements provided for asbestos-related works in SWA

(2016). This will include preparation of an asbestos register and associated asbestos removal control/management plan as outlined in SWA (2016). Appropriate signage specific to asbestos removal works will be provided.

Where sampling and analysis of specific fill materials, as anticipated following the removal of the asbestos soils hotspot (as per the sequencing nominated in **Section 6.4**) is completed in conjunction with inspection by an appropriately qualified person, and the results indicate the material does not fall within the "asbestos contaminated soil" definition, the requirements for management of "asbestos contaminated soils" will be able to be ceased. For the purposes of remediation works within the site, a competent person shall be considered to be a person who holds a tertiary degree in a science or engineering discipline, has experience in contaminated site assessment and has completed a WorkSafe approved Asbestos Removal Supervisor course, or otherwise a person accredited as a Licensed Asbestos Assessor (LAA).

Additional requirements for asbestos remediation works will be documented within the AMP, which shall make specific reference to the requirement for:

- Decontamination procedures;
- Air monitoring (**Section 6.6**);
- Exclusion zones;
- Fencing and signage; and
- Other relevant controls identified stipulated within SWA (2016).

6.6 Asbestos Air Monitoring

During the remedial works at the asbestos contaminated soil hotspot, perimeter air monitoring will be conducted on each of the site boundaries. Additional downwind monitoring locations will be included in the air monitoring program as required.

Air monitoring will be conducted in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes, in particular the Guidance note for the estimation of airborne asbestos dust [NOHSC 3002:2005] as detailed in **Section 9.10**.

6.7 Off-Site Disposal

Impacted fill materials are proposed to be disposed of off-site to appropriately licensed facilities. Fill/soil materials requiring disposal from site shall be classified in accordance with *Waste Classification Guidelines Part 1: Classifying Waste, November 2014, NSW EPA* (EPA 2014a) or an appropriate exemption or general immobilisation as created under the *Protection of the Environment Operations (Waste) Regulation 2014*.

Although not anticipated as requiring remediation, should natural soils require off-site disposal, natural soils shall also be classified in accordance with *Waste Classification Guidelines Part 1: Classifying Waste, November 2014, NSW EPA* (EPA 2014a).

Material will require to be removed to a facility lawfully able to receive it.

It is considered that additional sampling and analysis is required for appropriate waste classification of the impacted soil at the site. As potential acid sulphate soils / acid sulphate soils (PASS/ASS) may occur within the underlying natural soils, analysis of the natural soils for PASS/ASS would be required if these are disturbed during the works. This is described further in an Acid Sulphate Soils Management Plan as prepared for the site and is applicable to soils below a depth 2 m bgs. No remedial excavations are noted to be proposed to be undertaken to this depth.

The remedial contractor must be aware of and conduct all waste disposal in accordance with all relevant regulations. All waste tracking documentation including disposal dockets must be maintained by the remedial contractor and must be provided to the engaged environmental consultant for inclusion in the validation report.

6.8 Materials Importation

Materials imported to the site for the reinstatement of the excavation areas (if required) must be validated as per **Section 8.2.7.**

6.9 Validation

Validation of the remedial works will be conducted by the environmental consultant to demonstrate the remediation objectives have been achieved. Details of the validation program are provided in **Section 8**.

6.10 Site Disestablishment

On completion of the remediation works all plant / equipment and safety / environmental controls shall be removed from the site by the appointed remedial contractor / principal contractor. All equipment used during remediation works will need to be appropriately decontaminated or disposed of as waste by the contractor / principal contractor, in accordance with relevant waste regulations.

7. Contingency Plan

A review of remediation works has been undertaken to identify potential risks to meeting the specified site validation criteria (**Section 8**). A number of potential risks have been identified. These are listed following with contingencies that will be implemented to ensure that validation criteria are met.

Additionally, the associated remedial works health and environmental risks / hazards and their minimisation / mitigation are further discussed in **Sections 9** and **10**.

7.1 Unexpected Finds Protocol

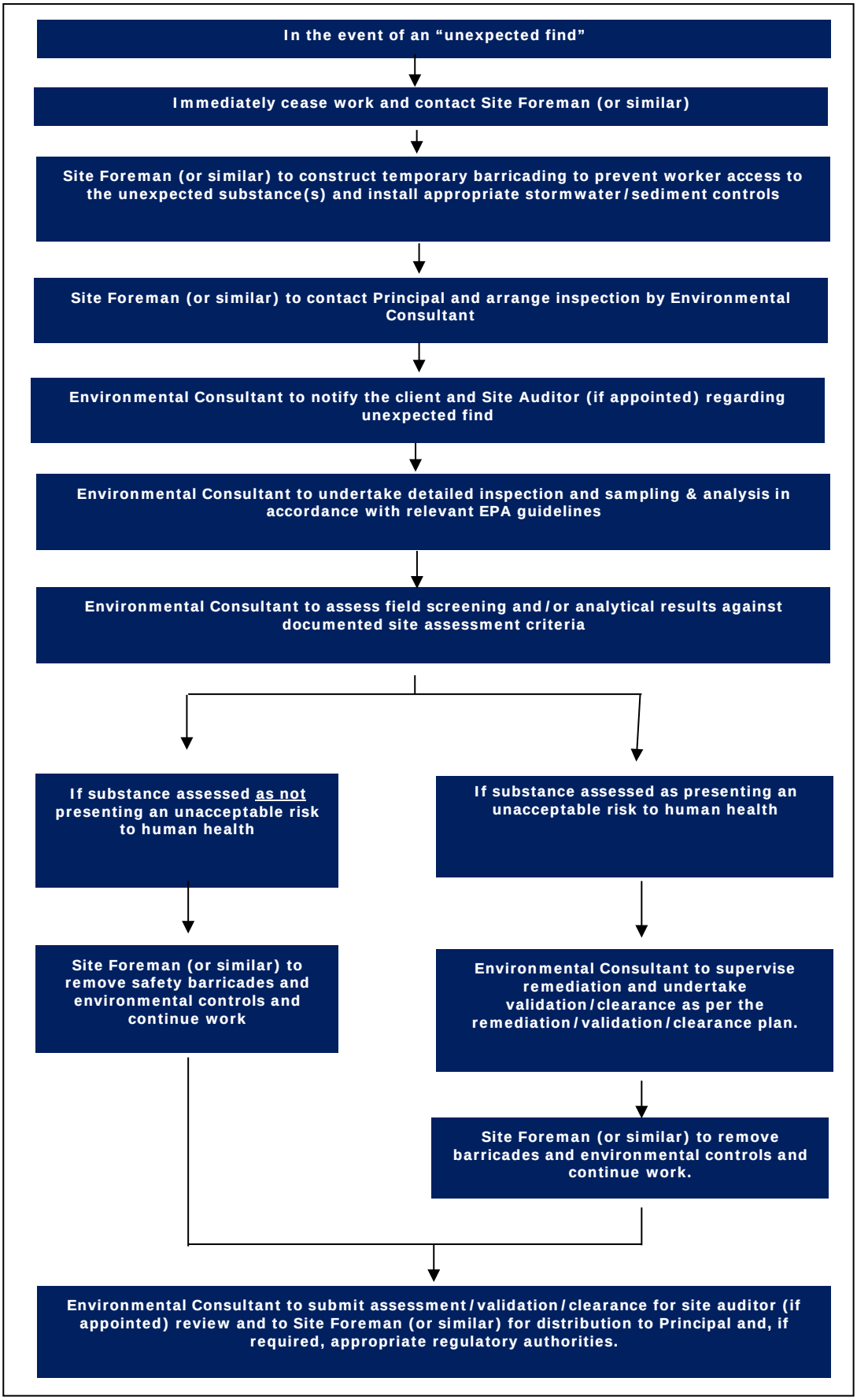
It is acknowledged that previous investigations of the site have been undertaken to assess the identified contaminants of potential concern. However, ground conditions between sampling points may vary, and further hazards may arise from unexpected sources and / or in unexpected locations during remediation. The nature of any residual hazards which may be present at the site are generally detectable through visual or olfactory means, for example:

- Bottles / containers of chemicals (visible);
- Tar contaminated soils / fill materials (visible);
- Fragments of ACM and/or AF/FA (friable asbestos) impacted materials, in addition to the localised areas as already known to be affected by asbestos;
- Petroleum contaminated soils (odorous, staining / discolouration visible) beyond identified or anticipated extent; and
- Volatile organic compound (VOC) contaminated soils (odorous) and vapours.

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances be identified (or any other unexpected potentially hazardous substance), the procedure summarised in **Flowchart 7.1** is to be followed.

An enlarged version of the unexpected finds protocol, suitable for use on-site, may be posted in the site office and referred to during the site-specific induction by the remedial / principal contractor.

Flowchart 7.1 – Unexpected Finds Protocol



7.2 Contingency Scenarios

7.2.1 Remedial Strategy Constraints

In the event that the proposed remedial works do not meet the validation criteria, or if the selected remedial strategy is not able to proceed (for proximity to a site boundary, heritage structure to be retained or otherwise), the following actions will be considered to ensure, firstly, the safety and health of people and the environment and, secondly, that the overall project objectives are achieved:

- Reassessment of remedial and validation options for PAH, lead, PCB (or other) impacted soils; and
- Continued controlled excavation/sorting of impacted soils; or
- Development and implementation of a suitable long-term Environmental Management Plan (EMP) to manage any unacceptable contamination that may have to remain.

7.2.2 Acid Sulfate Soils

Should remediation of the natural material be required, acid sulfate soils may be encountered. Should natural soils be excavated for remedial purposes below a depth of 2 m bgs, then reference shall be required to be made to the Acid Sulfate Soil Management Plan as prepared for the site, and intended to be applied to deeper excavation works (i.e. piling).

7.2.3 Material Storage Breach

In the event any stockpiled materials escape (or have the potential to escape), then the management controls shall be rectified and investigations undertaken to review the adequacy of the controls and any improvements implemented.

7.2.4 Complaints

Due to the nature of the activities and type of contaminants identified at the site there is a potential for complaints to be received from members of the public, relating to environmental emissions including:

- Dust emissions arising from soil excavation, material handling and transport;
- Odour emission associated with the excavation and exposure of odours material;
- Noise and vibration from excavation and truck movements; and
- Soil impact to local roads associated with poor cleaning practices of site vehicles.

Monitoring of all potential environmental emissions shall be undertaken as detailed in **Sections 9** and **10** and appropriate actions taken to further control emissions following receipt of a complaint. Such additional controls may include the following actions:

- Disturbance of soils during meteorologically favourable periods (minimal wind conditions) only; and / or
- Increasing environmental controls including covering and / or wetting down soils which are generating dust.

7.2.5 Severe Weather

Weather will be monitored on a daily basis via checking an internet based weather service provider or similar. Should severe weather be forecast, especially strong winds, works will stop until safe to re-commence. All site management controls will be implemented to the extent practicable as outlined in **Sections 9** and **10** prior to any severe weather events.

8. Validation Plan

8.1 Overview

Validation data is required to be collected to verify the effectiveness of the remediation works and document the condition of the site as being suitable for the proposed future uses.

Validation activities will be required for the following aspects:

- Collection of appropriate environmental data from excavations formed by the removal of contaminated soils;
- Collection of appropriate environmental data from residual soils underneath stockpiles where excavated contaminated material may be stored;
- Collection of appropriate environmental data from soils to be disposed of off-site or imported to the site;
- Tracking the movement of all soil and fill material on site;
- Tracking the movement of waste materials requiring off-site disposal;
- Assessment of materials imported to site, if required; and
- Validation of any unexpected finds if encountered.

8.2 Data Quality Objectives

DQOs were developed for the validation program, as discussed in the following sections.

8.2.1 State the Problem

The site, which has been previously used for a range of commercial purposes within a historically urbanised area is proposed to be developed for an open space / recreational site use. Demolition of the current buildings is proposed, and the site is to be made suitable for the proposed land-use.

A previous investigation has identified three specific areas of fill materials impacted to varying degrees by lead, PAHs, PCBs and/or asbestos as representing a potential environmental and human health risk and associated aesthetic issues requiring remediation / management for the site to be considered suitable for the open space / recreational land use.

During remediation activities, sufficient validation of site activities is required to demonstrate that the identified environmental and health based risks to site users, and aesthetic issues, have been adequately managed to render the site suitable for the indicated land use.

Groundwater and vapours are not considered to present an exposure risk at the site as discussed in **Section 4.2**.

8.2.2 Identify the Decision

The decisions which are required to be made for validation of the site are:

- Do contaminant concentrations remain in soils above the adopted site validation criteria?
- Are there any aesthetic issues?
- Have the site remediation activities been undertaken in compliance with the RAP including waste classification and off-site disposal of material?
- Was imported material used to backfill suitable for the intended land use?
- Is an LTEMP required to address management of any residual potential for contamination (i.e., impacted fill material and /or aesthetic impacts within the site)?
- Is the site suitable for high density residential land use?

During the remediation activities, sufficient validation of site activities is required to demonstrate that the identified environmental and health based risks to future use(s) of the site have been adequately managed to render the site suitable for the indicated land use (open space / recreational).

8.2.3 Identify Inputs to the Decision

The inputs to the decision are:

- Previous investigation data;
- Field observations in relation to inspection of all excavation bases, walls and stockpiles for odours, sheen, discolouration, and other indicators of potential contamination;
- Soil validation analysis data collected from the base and walls of the remedial excavation;
- Waste classification and material characterisation data obtained during assessment of fill material prior to and during remediation works;
- Field observations, sampling and analytical data for imported materials (if required);
- Field observations, sampling and analytical data of any unexpected finds;
- Disposal dockets and relevant documents in relation to appropriate disposal of material to be removed from site as part of the remediation works (landfill dockets, beneficial reuse / recycling dockets, trade waste disposal, etc.);
- Relevant guideline criteria for validation and waste classification; and
- Data quality indicators (DQIs) as assessed by quality assurance / quality control (QA/QC).

8.2.4 Define the Study Boundaries

The subject site is identified as Lot 1 and Lot 2 in DP1247122 and Lot 1 in DP128476. The boundary of the subject site is shown on **Figure 2**.

It is noted the lateral and vertical extents shall be determined by validation observations, field screening and sample data that satisfy the adopted validation criteria (**Section 8.4**). Notwithstanding the anticipated extent of remedial works is shown on **Figure 5** and is proposed across three areas, described as the central, eastern and south-eastern portions of the site of estimated lateral extent of 300, 250 and 1500 m^2 respectively and to a typical depth of 0.5m. The depth of the remedial works shall be determined to the depth of underlying natural soils, or otherwise visually different fill materials not affected by inclusions of anthropogenic materials.

The assessment and remedial effort will only focus on soil. Groundwater and surface water are not considered to be at risk of exposure and so are outside the boundary of the study.

Due to the nature of potential contaminants identified, temporal variables will not be assessed as part of this investigation. The temporal boundaries of this investigation will be limited to the period of field validation assessment works.

8.2.5 Decision Rules

The decision rules adopted to answer the decisions identified in **Section 8.2.2** are discussed following in **Table 8.1**.

Table 8.1: Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Do contaminant concentrations remain in soils below the adopted site validation criteria?	Soil analytical data will be compared against EPA endorsed criteria as established in the RAP. For the validation sample sets, statistical analysis of the data will be undertaken in accordance with relevant guidance documents, as appropriate, to facilitate the decisions. The following statistical criteria will be adopted with respect to soils: Either: the reported concentrations will be all below the site criteria; Or: the average site concentration for each analyte will be below the adopted health / ecological based criterion; no single analyte concentration exceeded 250% of the adopted health / ecological based site criterion; and the standard deviation of the results will be less than 50% of the site health / ecological based criterion. And: the 95% UCL of the average concentration for each analyte will be below the adopted health / ecological based site criterion. If the statistical criteria stated above is satisfied, the answer to the decision will be **Yes**. If the statistical criteria are not satisfied, the answer to the decision will be **No**.
2. Are there any aesthetic issues remaining following remediation works?	If there are any remaining unacceptable odours, soil inclusions or soil discolouration, the answer to the decision will be **Yes**. Otherwise, the answer to the decision will be **No**.
3.Have the site remediation activities been undertaken in compliance with the RAP including waste classification and off-site disposal of material?	Qualitative assessment of the works in relation to the RAP and regulatory approvals will be undertaken during and following the completion of remediation activities. If there are no outstanding requirements with respect to the regulatory approvals, the decision will be **Yes**. Otherwise, the answer to the decision will be **No**.
4. Was imported material imported for backfilling (if required) suitable for the intended land use? (if backfill is required)	Soil analytical data will be compared against EPA endorsed criteria and the definition of VENM. Statistical analyses of the data in accordance with relevant guidance documents will be undertaken, if appropriate, to facilitate the decisions (as detailed above in Item 1)). If the statistical criteria stated above are satisfied, the decision is **Yes**, or if supporting documentation from the source site is provided regarding suitability for use, the decision is **Yes**. If soil analytical data exceeds the EPA endorsed criteria or documentation from source site is not provided, the answer is **No**.

Decision Required to be Made	Decision Rule
5. Is there any material or impact remaining that exceeds the adopted site validation criteria?	If material exceeding adopted site validation criteria remains and remediation has proceeded to the extent practicable then the answer to the decision is **Yes**. If **yes**, the issues are required to be documented within a long term environmental management plan (LTEMP) to be prepared for this site to address outstanding contamination issues. If no, an EMP is not required to be prepared for the site area to address outstanding issues.
6. Is the site considered suitable for the proposed land use?	If there are no potentially unacceptable risks to human health and the environment remaining onsite, then the answer is **Yes**. Otherwise the answer is **No**.

8.2.6 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), appropriate indicators of data quality (DQIs used to assess quality assurance / quality control) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined DQIs for to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters). The acceptable limit on decision error is 95% compliance with DQIs.

The pre-determined DQIs established for the project are discussed below in relation to the PARCC parameters, and are shown in **Table 8.2**.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD[6]) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; and ensuring analysing laboratories use consistent analysis techniques; and reporting methods.

6 $$RPD(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where C0 is the analyte concentration of the original sample
Cd is the analyte concentration of the duplicate sample

- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 8.2: Summary of Data Quality Indicators

Data Quality Indicators	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD[1]
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD[1]
Laboratory Duplicates	1 / 20 samples	<50% RPD[1]
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes	All samples	-[2]
Samples extracted and analysed within holding times.	All samples	Soil: organics (14 days), inorganics (6 months) Water: organics (7 days to extract and 14 days to analyses). Metals (6 months)
Laboratory Blanks	1 per lab batch	<LOR
Trip spike	1 per lab batch	70-130% recovery
Storage blank	1 per lab batch	<LOR
Rinsate sample	1 per sampling event/media	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All Samples
Standard analytical methods used for all analyses	All Samples extracted and analysed within holding times	NATA accreditation
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[2]
Limits of reporting appropriate and consistent	All Samples extracted and analysed within holding times	All samples[2]
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples[2]
Appropriate documentation	All Samples	All samples[2]
Satisfactory frequency and result for QC samples		95% compliance
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All samples	LOR<= Site assessment criteria

(1) If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

(2) A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.

8.2.7 Optimise the Design for Obtaining Data

The purpose of this step is to identify a resource-effective field validation sampling design that generates data that are expected to satisfy the decision performance criteria, as specified in the preceding steps of the DQO process. The output of this step is the sampling design that will guide development of the field sampling and analysis plan. This step provides a general description of the activities necessary to generate and select data collection designs that satisfy decision performance criteria.

The remediation validation and subsequent laboratory analysis program as outlined in the following sections will need to be implemented during site remediation activities to demonstrate the successful completion of works in compliance with the RAP goals. The validation / characterisation sampling and analytical program for the site is outlined in **Table 8.3** following.

Table 8.3: Characterisation / Remediation and Validation Sampling Program

Item	Sampling Frequency			Analytes
	Excavation Base	Excavation Walls	Materials	
Asbestos hotspot excavation at JBS&G (2016a) HA01	4 base samples, 1 / 25 m^2	16 (2 wall samples per each of north, south, east and western extents)	N/A	Asbestos (bonded and asbestos fines/fibres), 500 ml samples
South-eastern hotspot excavation	15 base samples, 1/100 m^2	28 wall samples spacing at 1/10 m	N/A	Heavy metals, TRH, PAHs and PCBs
Eastern Hotspot Excavation	5 base samples, between 1/25 and 1/100 m^2	10 wall samples, spacing at <1/10 m	N/A	Heavy metals, TRH and PAHs
Central hotspot Excavation	5 base samples, between 1/25 and 1/100 m^2	10 wall samples, spacing at <1/10 m	N/A	Heavy metals, TRH and PAHs
Footprint of Stockpiles (if no plastic present)	1/25 m^2 (5 m grid)	N/A	N/A	Heavy metals, TRH, PAHs, PCBs and asbestos
Waste classification of materials requiring offsite disposal (asbestos affected soils stockpile)	N/A	N/A	1 sample, small stockpile	Heavy Metals TRH/BTEX, PAHs, PCBs, TCLP Heavy Metals and TCLP PAHs
Waste classification of materials requiring offsite disposal (non-asbestos affected soils stockpile)	N/A	N/A	Up to 4 samples for large stockpile, sampling at 1/250 m^3 (more samples may be required should different material be observed)	Heavy Metals TRH/BTEX, PAHs, PCBs, TCLP Heavy Metals TCLP PAHs Or otherwise appropriate COPC
Imported VENM	N/A	N/A	Minimum of 5 samples per material types/source site	Heavy Metals TRH/BTEX, PAHs OCPs/PCBs Asbestos (500 mL)

The base sampling frequency for the excavation is considered suitable as it is expected that all fill material will be remediated to natural, or otherwise visually distinct deeper fill material not affected by inclusions of anthropogenic materials. As such, it is considered that the sampling frequency (based on the NSW EPA Sampling Design Guidelines 1995) is appropriate for validation in conjunction with visual assessment.

It is proposed that a single sample will be collected and analysed for waste classification from the small stockpile of asbestos affected soils; and four samples will be collected and analysed for waste classification from the larger stockpile as generated from the remaining remedial works. A waste classification letter will be prepared considering the collected analytical data and the analytical data

as applicable to these soils from JBS&G (2020) to allow appropriate classification of the material. Should different fill material be identified, additional waste classification sampling may be required.

During the site works, should fill conditions be identified to be dissimilar that that described in **Section 4**, the unexpected finds protocol shall be implemented to characterise site conditions, as per **Table 8.4**.

Table 8.4: Characterisation of Unexpected Finds

Validation Sample Type	RAP Sampling Frequency	Analytical Suite
Additional Fill Characterisation (where fill is materially different from that described in **Section 4**) and requiring off-site disposal	1 / 100 m^3, minimum of 3 samples	Heavy metals PAHs OCPs / PCBs TRH / BTEX Asbestos (500 mL) TCLP heavy metals and PAHs
Unexpected Finds	As appropriate, depending on the location and characteristics of the unexpected find	As appropriate, depending on the location and characteristics of the unexpected find

The nominated sampling densities and analytical program have considered sample density guidance provided in EPA made and endorsed guidelines.

8.3 Soil Sampling Methodology

8.3.1 Waste Classification

Prior to site remediation works, or otherwise following excavation and stockpiling of soils, soil samples will be collected by an environmental consultant for waste classification purposes. The samples will be collected and placed in laboratory supplied glass jars. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory. The samples will be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory.

8.3.2 Validation of Excavation(s)

Samples shall be collected by an environmental consultant from near surface depths of excavation walls and bases either directly by hand using new nitrile gloves between samples, or with the aid of a hand trowel. Where used, the hand trowel will be thoroughly decontaminated using phosphate free detergent and distilled water between each sampling location.

Samples will be collected and place in laboratory supplied glass jars. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory. The validation samples will be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory.

During the collection of soil samples, the presence or absence of ash and clinker will be noted on the field documentation.

Soil validation samples shall be analysed by a primary laboratory which shall be NATA accredited for the required analyses. The secondary (check) laboratory responsible for analysing a certain proportion and type of QA/QC samples shall also be NATA accredited for the required analyses. Both laboratories will also be required to meet the environmental consultant's own internal quality assurance requirements.

8.3.3 Stockpile Sampling

If fill materials for off-site disposal to landfill are identified that vary from the description of the material classified prior to remediation works, then these materials shall be stockpiled or assessed in-situ and re-classified in accordance with EPA (2014) Waste Classification Guidelines.

Samples of such material will be obtained as necessary for characterisation of material for off-site disposal, etc. As for the excavations, samples will be obtained by appropriately trained and experienced personnel by the use of hand trowel, hand auger or excavator bucket, as appropriate.

For stockpile sampling, material will be obtained from a minimum depth of 0.3 m below the surface of the stockpile at the time of sampling. Following each sample, non-disposable hand tools will be decontaminated as discussed in **Section 8.3.6**.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination will be noted on the field documentation and a PID will be used, as appropriate, to assess the potential occurrence of volatile compounds.

8.3.4 Sample Handling

Collected samples will be immediately transferred to sample containers of appropriate composition (glass jars for chemical analysis). Sample labels recorded: job number; sample identification number; and date of sampling.

Sample containers will be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory.

Samples collected for asbestos analysis (if required) will be transferred to a bulk bag. A minimum quantity of 500mL will be collected for analysis.

8.3.5 Soil Duplicate and Triplicate Sample Preparation and QA/QC Requirements

Field duplicate and triplicate samples for the characterisation / validation assessment will be obtained during sampling using the procedures outlined above at a frequency of 1 in 20 primary samples for both field intra-laboratory duplicates and field inter-laboratory duplicates, as listed in **Table 8.3**. The samples will be divided laterally into 3 samples (primary, duplicate, triplicate) with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and / or plastic bags. All jars will be filled with no headspace to reduce the potential for loss of volatiles and separately labelled as the primary, duplicate and triplicate samples before being placed in the same chilled esky for laboratory transport.

Trip spike, storage blank and rinsate samples will be collected as per the relevant analytes as targeted by the validation assessment and listed in **Table 8.3**.

8.3.6 Soil Sampling Equipment Decontamination

The following procedure will be used to clean non-disposable equipment, including the trowel, pick etc., prior to the collection of each sample:

- Scrubbing with a wire brush to remove gross contamination;
- Pressure spray with Decon 90 detergent and potable water mix;
- Pressure spray rinse with potable water; and
- Air drying.

Rinsate samples will be obtained during the field decontamination procedures at regular intervals during characterisation / validation sampling activities. Each rinsate sample will be obtained by rinsing the trowel with laboratory grade demineralised water following the decontamination

procedure. The water sample will be appropriately preserved and stored with the site samples prior to transport to the laboratory for chemical analysis.

8.3.7 Laboratory Analyses

JBS&G propose to use Eurofins MGT Pty Ltd at Lane Cove, NSW as the primary laboratory for the required analyses. The secondary laboratory to be contracted for the works will be Envirolab Services Pty Ltd (Envirolab) at Chatswood, NSW. All laboratories are National Association of Testing Authorities (NATA) registered for the relevant analyses. In addition, the laboratories are required to meet JBS&G's internal QA/QC requirements.

8.4 Validation Criteria

The following is a discussion of validation criteria to be adopted during remediation works within the site. No criteria are provided for groundwater or surface water as impact to these receptors from the site is unlikely as outlined in **Sections 4** and **5**, and no requirement for remedial works in these media have been identified.

8.4.1 Soil Validation Criteria and Rationale

Laboratory results from validation soil samples will be compared against adopted health-based criteria listed in NEPC (2013) for open space / recreational land use in alignment with the proposed use of the site as a community facility:

- Human Health Investigation Levels (HIL) – Open Space / Recreational (HIL-C);
- Human Health Screening Levels (HSL) – Open Space / Recreational (HSL-C);
- Aesthetic considerations – no asbestos containing materials or metallic wastes visible in near surface / excavated soils or other malodorous / stained soils present; and
- Asbestos – no visible asbestos containing material and validation samples for asbestos fibres below laboratory detection limit.

Ecological criteria have not been included in the consideration of validation criteria. These criteria are somewhat addressed for the constituents of potential concern in the health-based validation criteria adopted. Otherwise it is acknowledged that the site is present in a historically urbanised area and elevated levels of heavy metals are present in soils. It is anticipated that this would be acknowledged in the landscape / garden design of the proposed development and specialised imported growing media / topsoils would be used in areas of the site as propose as open space / gardens / landscaped areas. The remainder of the site would be paved, and potential ecological exposures to soils limited.

8.4.2 Statistical Analysis of Data

Where sufficient data sets are available for chemical COPCs (excluding asbestos), statistical criteria will be applied as outlined in Decision Rule 1 of **Table 8.1**, and generally as follows:

Either:

- all contaminant concentrations were less than the adopted site assessment criteria,

Or:

- The upper 95% confidence limit of the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) was below the adopted criterion;
- No single analyte concentration exceeded 250% of the adopted criterion; and
- The standard deviation of the results was less than 50% of the criterion.

In addition to the numerical criteria, the following observations will also supplement the validation process:

- Soils shall not emit recognisable odours, be discoloured because of contamination or have any significant additional aesthetic concerns with respect to future site users (i.e. inclusive of metallic wastes or potential asbestos containing materials).

8.4.3 Offsite Disposal Criteria

Contaminated soils requiring disposal off-site shall be assessed in accordance with EPA (2014) *Waste Classification Guidelines Part 1: Classifying Waste*. Refer to **Table 8.3**.

8.4.4 Imported Soil Criteria

In accordance with current EPA policy, only material that does not represent an environmental or health risk at the receiving site may be considered for resource recovery. In accordance with this, only VENM as defined in the *Protection of the Environment Operations Act* (1997) Schedule 1 can be utilised to reinstate excavations at the site or materials covered by a NSW EPA exemption. Refer to **Table 8.3**.

8.5 Validation Reporting

A validation report shall be prepared by the remediation consultant written in general accordance with EPA reporting guidelines (OEH 2011).

The validation report should contain information including:

- Results of previous investigations conducted at the site;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of the RAP have been achieved;
- Information demonstrating compliance with appropriate regulations and guidelines;
- All material tracking data;
- Any variations to the strategy undertaken during the implementation of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents; and
- Other information as appropriate, including any requirements for ongoing management.

9. Site Management Plan

Additional management controls in any development consent will need to be met in accordance with the conditions of the State Significant Development Approval.

9.1 Hours of Operation

Typical hours of operation for remedial works are expected to be:

- Monday to Friday: 7am to 5pm.
- Saturday: 8 am to 5 pm.
- Sunday and public holidays: No work permitted.

9.2 Soil and Water Management

All works shall be conducted in general accordance with Soils and Construction Managing Urban Stormwater Standards (Landcom 2004), which outlines the general requirements for the preparation of a soil and water management plan.

9.3 Stockpile Management

All materials stockpiled onsite will be managed by the remedial contractor. Unique numbers will be provided for each stockpile, the source of the stockpile, its estimated volume, material characterisation and its location onsite will also be recorded.

The following procedures will be implemented by the remedial contractor:

- 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 (where practical); and
- All stockpiles of contaminated soil shall be placed on plastic sheeting to limit cross contamination of the underlying soils and stored in a secure area.

9.4 Site Access

Any vehicle access to the site shall be stabilised to prevent the tracking of sediment onto the roads and footpaths. All materials must be removed from the roadway on a daily or as required basis.

9.5 Excavation Pump-out

No excavation pump-out is expected with the current proposed remediations works.

9.6 Landscaping / Rehabilitation

Plans for the proposed landscaped areas have been provided and will be present within the north-eastern portion of the site, and across the Parramatta River foreshore. It has been assumed that landscaping materials will be imported to site. Any imported soils (VENM) should be filled only to a level consistent with the previously removed soils (if required).

9.7 Noise

Remediation work shall not give rise to 'offensive noise' as defined in the *Protection of the Environment Operations (POEO) Act 1997*. All equipment and machinery associated with the remediation work shall be operated by the Contractor in accordance with *the POEO Act 1997* and its *Noise Control Regulations 2000*.

The remediation works shall comply with the NSW EPA's environmental noise guidance (DECC 2009 and EPA 2013) for the control of noise from construction sites which specifies that:

- For recommended standard hours, all feasible and reasonable work practices should be employed to meet the noise affected level, described by DECC (2009) as the L_{Aeq} (15 minute) rating background noise level (RBL) plus 10dB(A) (noise affected), and there should be no exceedance of the highly noise affected level of 75 dB(A).

All machinery and equipment used on site will be in good working order and fitted with appropriate silencers when necessary.

9.8 Vibration

Vibration generated should be managed so as not to adversely impact the amenity or residents/business adjoining or nearby the site.

9.9 Air Quality

During remedial works, dust emissions and any odours will be confined within the site boundary. Given the limited extent of remedial excavation anticipated and the minor non-volatile nature of the contaminants, air monitoring is not considered necessary, apart from the specific provisions detailed in **Section 9.10** following and specific to initial stage of excavation works of the asbestos impacted soils at JBS&G (2016a) HA01 hotspot.

9.10 Asbestos Air Monitoring, JBS&G (2016a) HA01 Hotspot Remediation

Perimeter air monitoring will conducted for the remediation of the asbestos hotspot at HA01 as assessed in JBS&G (2016a) and present at the south-eastern portion of the site. Air monitoring will be restricted to the duration of these works and the extent of time that excavated soils from these works are retained on the site (prior to disposal).

Air monitoring works are to be conducted in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC*) Asbestos Code of Practice and Guidance Notes*, in particular the Guidance note for the estimation of airborne asbestos dust [NOHSC 3002:2005

Air filters shall be analysed by a NATA accredited laboratory and results shall be required to be below 0.01 fibres/mL. All detections of fibres shall be further analysed by scanning electron microscope (SEM) to confirm the fibres are asbestos.

If respirable asbestos fibres are confirmed and present between 0.01 and 0.02 fibres/mL, the following controls must be implemented, in accordance with SWA (2011);

- Review control measures;
- Investigate the cause; and
- Implement controls to eliminate or minimise exposure and prevent further release.

If respirable asbestos fibres are confirmed and present above 0.02 fibres/ml, the following controls must be implemented, in accordance with SWA 2011;

- Stop removal work;
- Notify SafeWork NSW by phone, then by fax or written statement that work has ceased;

- Investigate the cause;
- Implement controls to eliminate or minimise exposure and prevent further release; and
- Do not recommence removal work until further air monitoring is conducted and fibre levels are detected below 0.01 fibres/mL.

A daily air monitoring report will be prepared documenting the previous / same day airborne asbestos fibre air monitoring results. This report will be made available to all relevant stakeholders, including but not limited to:

- Site workers;
- Health and safety representatives for the workplace; and
- The persons conducting business or undertakings at the workplace.

9.11 Dust Control

During the remedial works, as necessary, excavation areas will be wetted down using a water spray to minimise the potential for dust to be generated by the remedial contractor.

Any asbestos impacted soils, such as those excavated form the JBS&G (2016a) HA01 hotspot, must be wetted (but not flooded) prior to and during excavation and movement of the soils.

During all remedial works, dust screens should be erected around the perimeter of the site by the remedial contractor. Where significant fugitive emissions are observed from specific site areas, these areas shall be wetted and/or covered by the remedial contractor.

Meteorological conditions will be monitored by the environmental consultant and remedial contractor. Remedial work will be stopped or modified where meteorological conditions are adverse (i.e., dry conditions and strong winds towards sensitive receptors).

Should plant and vehicles access the site, they should limit their speed and only traverse wetted haul roads. Dust shall also be controlled by ensuring vehicles leave via the designated (stabilised) site access point.

9.12 Transport of Material Offsite

Trucks will be loaded in designated areas. The Contractor shall ensure that there is no material tracked out onto the street and that the load is securely covered. In addition, all site vehicles must leave the site in a forward direction.

The Contractor shall also log truck movements and approximate volume, via registration number and consignment number (where applicable), into and out of the site. Truck load details will be included as part of the Validation Report.

All appropriate road rules shall be observed, and state roads will be selected as far as practicable over local roads when deciding on the transport route to the off-site material disposal location.

9.13 Hazardous Materials

Hazardous and / or intractable wastes arising from the remediation work shall be removed and disposed of in accordance with the requirements of NSW EPA, SafeWork NSW and the relevant regulations by the Contractor.

In particular, any hazardous wastes will be transported by a NSW EPA licensed transporter.

9.14 Disposal of Contaminated Soil

All soils will be classified, managed and disposed in accordance with the Waste Classification Guidelines (EPA 2014a). Documentary evidence for all soil disposal shall be kept for inclusion in the Validation Report.

9.15 Imported Fill

Any materials imported on site by the Contractor to re-establish ground levels following remedial excavations must be validated, environmentally suitable material, consistent with the definition of VENM.

9.16 Groundwater

It is anticipated no dewatering will be required for the remediation works. If dewatering is required as part of the remediation works, a licence shall be applied for from the Office of Water for approval to extract groundwater.

9.17 Site Signage and Contact Numbers

A sign/s shall be displayed adjacent to the site access point/s throughout the duration of the works with the contact details of the remedial contractor and project manager as provided and maintained by the remedial contractor.

9.18 Site Security

The remedial areas shall be secured against unauthorised access by means of an appropriate fence or barricade by the remedial contractor. All persons working in asbestos remedial areas must be inducted, have undertaken required training and don appropriate person protective equipment (PPE). The access gates will be locked at all times when remedial works are not occurring.

9.19 Community Consultation

Owners and/or occupants of adjacent premises and across the road from the site will be notified by the client at least seven days prior to the commencement of preparation for the remediation works, or as otherwise required by the client and/or consent conditions. As a minimum, the notification shall include the details of an appropriate contact person.

10. Environmental and Health and Safety Management

10.1 Environmental Management

10.1.1 Remediation Environmental Management Plan

Prior to commencement of remediation works on the site, a Remediation Environmental Management Plan (REMP) shall be prepared by the remedial contractor, which documents the environmental monitoring and management measures required to be implemented during remediation of the site.

The REMP shall address each of the nominated items in **Section 10.1.2**.

10.1.2 Required Elements/Procedures

An assessment of the proposed activities and the associated elements required to be incorporated into the REMP is provided in **Table 10.1**. The REMP is required to address each of the required elements and procedures in full detail and to include detailed monitoring processes and procedures, corrective actions and reporting requirements.

Table 10.1: Required Elements of the REMP

Element	Specific Minimum Requirements to be included in CEMP
1. Dust and Airborne Hazard Control (for asbestos materials disturbance and/or removal)	Asbestos air monitoring (if conducted). Provisions for dust control based on monitoring results.
2. Flora and Fauna	N/A
3. Heritage/Archaeological	N/A
4. Visual Impacts	N/A
5. Emergency Response	As appropriate. Procedures required for spill incident response including material storage breach.
6. Noise Control	Hours of operation. Boundary monitoring at commencement of work site activities with potential for environmental noise emissions. Potential noise monitoring at nearest receptors. Procedures for control and management of noise emissions, as appropriate (e.g., restricted hours).
7. Traffic	Controls on vehicle movements on public roads. Controls on transport in asbestos exclusion zones (if required)
8. Protection of Adjoining Structures	N/A
9. Odour Control	Procedures for management of potentially odorous works.
10. Handling of Contaminated Soil and Groundwater	Soil and water (if encountered) management (stockpiling, site access, excavation pump out, reinstatement).
11. Soil Storage/Placement Areas	Soil and water management (stockpiling, site access, excavation pump out, reinstatement). Bunding. Heavy vehicle/personnel decontamination. Interim storage requirements for materials requiring later treatment. Site drainage requirements, incorporating clean/dirty areas and modifications to existing surface water and drainage controls beneath retained pavements. Monitoring as required.
12. Sediment Control	Bunding. Collection/treatment/handling impacted sediments.
13. Operation of Site Office	As appropriate.
14. Asbestos Works	Required notifications, permits, signage and exclusion zones. Required personal (e.g. Class A removalist). PPE and decontamination. Staging of asbestos and non-asbestos works. Respirable fibre air monitoring LAA / competent person inspections / clearances

Element	Specific Minimum Requirements to be included in CEMP
15. Environmental Monitoring	Monitoring of dusts, noise, odour and fibres (if required). Monitoring as required for vibration and water releases. Inspection checklists and field forms.
16. Environmental Criteria	Soil criteria as sourced from RAP.
17. Material Classification	As detailed in this RAP.
18. Waste Management	All waste materials classified in accordance with the RAP are required to be disposed of at a licensed waste facility that are lawfully able to accept such materials. Material tracking in the form of disposal dockets will be required for the purposes of satisfying the validation report.
19. Community Relations Plan	Client to provide project specific communication protocols, incorporating nomination of specific contact persons & details and requirements for communications/response register.
20. Incident Reporting	As appropriate, including standard form/checklist.
21. Security and Signage	Secure site perimeter. Site boundary signage. Remediation exclusion zone signage where required.
22. EMP Review	As appropriate.
23. Training	As appropriate. Contamination awareness training for all workers.
24. Contact Details	Company/personnel details, including names/phone numbers for: - Principal Contractor - Site Auditor (if involved) - Environmental Consultant - Contractor - OH&S Compliance - Environmental Compliance

10.2 Health and Safety Management

A Work Health & Safety Management Plan (WHSP) shall be prepared by the remedial contractor prior to commencement of remediation works on the site. The Plan shall contain procedures and requirements that are to be implemented as a minimum during the works.

The objectives of the WHSP are:

- Ensure all regulatory requirements for the proposed works are satisfied;
- To apply standard procedures that minimises risks resulting from the works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, mandatory safety practices and procedures;
- Monitoring of potential hazards and implementation of corrective measures; and
- Provision for contingencies that may arise while activities are being conducted at the site.

The WHSP should consider the following as a minimum:

- Asbestos hazards;
- Chemical hazards;
- Physical hazards;

- PPE;
- Decontamination;
- Traffic control; and
- Emergency response.

11. Conclusions

With reference to the limitations in **Section 12**, the following conclusions and recommendations are provided.

11.1 Conclusions

It is considered that the proposed actions outlined in this RAP conform to EPA requirements because they are: technically feasible; environmentally justifiable; and consistent with relevant laws, policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures described in this RAP and the recommendations below, it is concluded that the risks posed by potential direct human contact pathways with contamination can be managed in such a way as to be adequately protective of human health such that the land can be made suitable for the proposed land use.

11.2 Recommendations

It is recommended that the processes outlined in this RAP be implemented to ensure the risks and impacts during remediation and construction works are controlled in an appropriate manner.

A Site Management Plan, which includes monitoring and management measures required to control the environmental impacts of the works, has been prepared as **Section 9**, and this shall be implemented. An Asbestos Management Plan (AMP) shall be further required to be prepared by the remedial works contractor to control potential exposure risks associated with asbestos fines impacted soils. A Remediation Environmental Management Plan (REMP) shall further be prepared prior to the commencement of remedial works.

A Workplace Health and Safety Plan (WHSP) to document the procedures to be followed to manage the risks posed to the health of the workforce shall be prepared and implemented.

Upon completion of the remediation works, a Validation Report is required to be prepared to verify remedial works were completed in accordance with the RAP.

12. 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.

13. References

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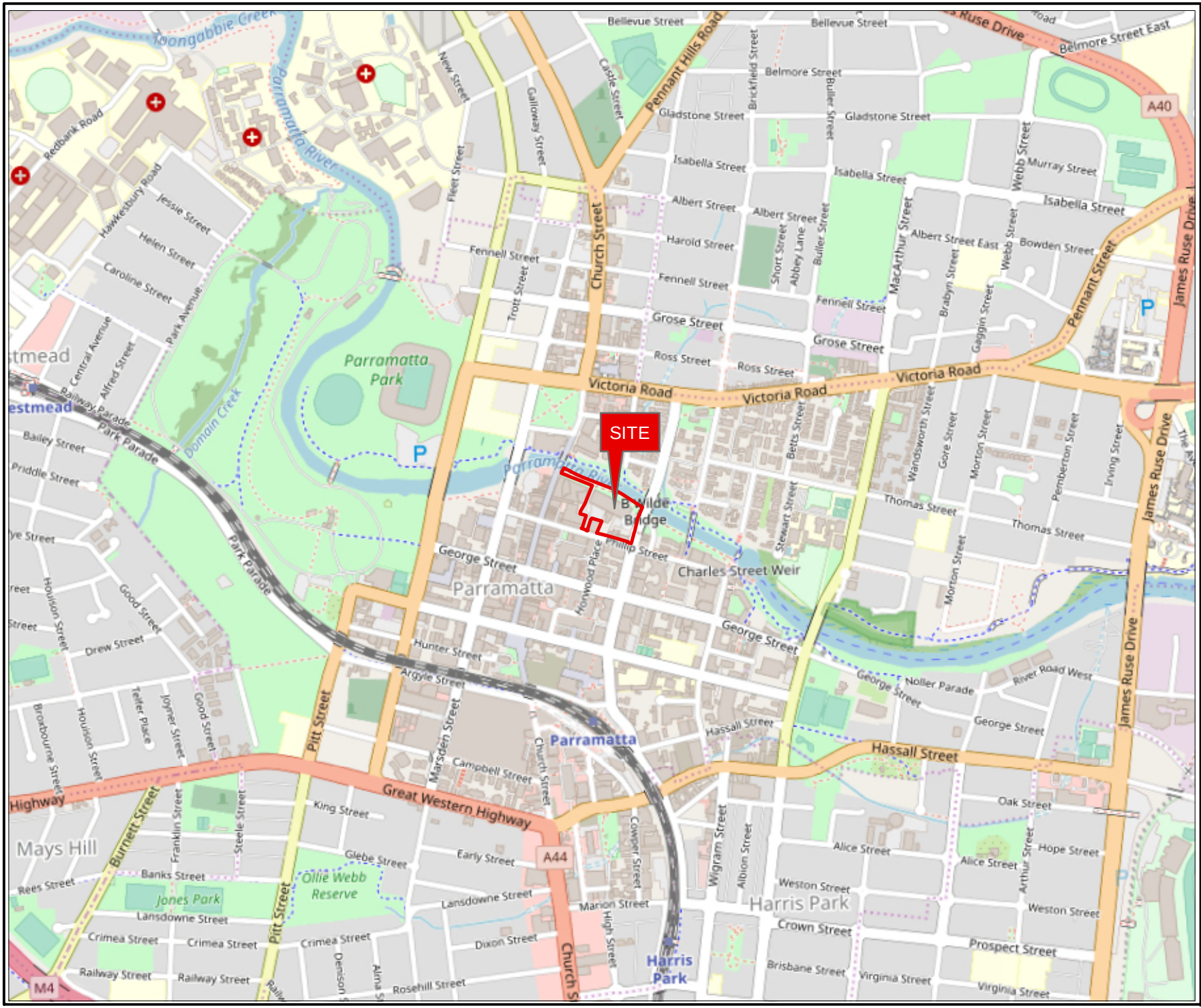
Figures



Legend:

Approximate Site Boundary

JBS&G

Job No: 58352	
Client: Infrastructure NSW	
Version: R02 Rev 0	Date 26/03/2020
Drawn By: AS/RF	Checked By: MP

Scale 1:15,000

0 200 400

metres

Coord. Sys. GDA 1994 MGA Zone 56

Phillip Street, Parramatta, NSW

SITE LOCATION

FIGURE 1

File Name: N:\Projects\Infrastructure NSW\58352 - Parramatta Powerhouse\GIS\Maps\R02 Rev A\58352_01_SiteLocation.mxd

Legend:

- Approximate Site Boundary
- Cadastre (NSW DCS, 2020)

JBS&G

Job No: 58352	
Client: Infrastructure NSW	
Version: R02 Rev 0	Date 26/03/2020
Drawn By: AS/RF	Checked By: MP
Scale 1:1,250	

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Phillip Street, Parramatta, NSW

CURRENT SITE LAYOUT

FIGURE 2

File Name: N:\Projects\Infrastructure NSW\58352 - Parramatta Powerhouse\GIS\Maps\R02 Rev A\58352_02_CurrrentSiteLayout.mxd
Reference: www.nearmap.com - Imagery 22-01-2020

Legend:

- Approximate Site Boundary
- Cadastre (NSW DCS, 2020)

Sample Locations

- Sample Locations (EIS 2013)
- Sample Locations (JBS&G 2016a)
- Sample Locations (JBS&G 2016b)
- Groundwater Monitoring Well Locations (JBS&G 2020)
- Soil Bore Sample Locations (JBS&G 2020)

JBS&G

Job No: 58352	
Client: Infrastructure NSW	
Version: R02 Rev 0	Date 26/03/2020
Drawn By: RH/RF	Checked By: MP
Scale 1:1,250	

0 10 20
metres

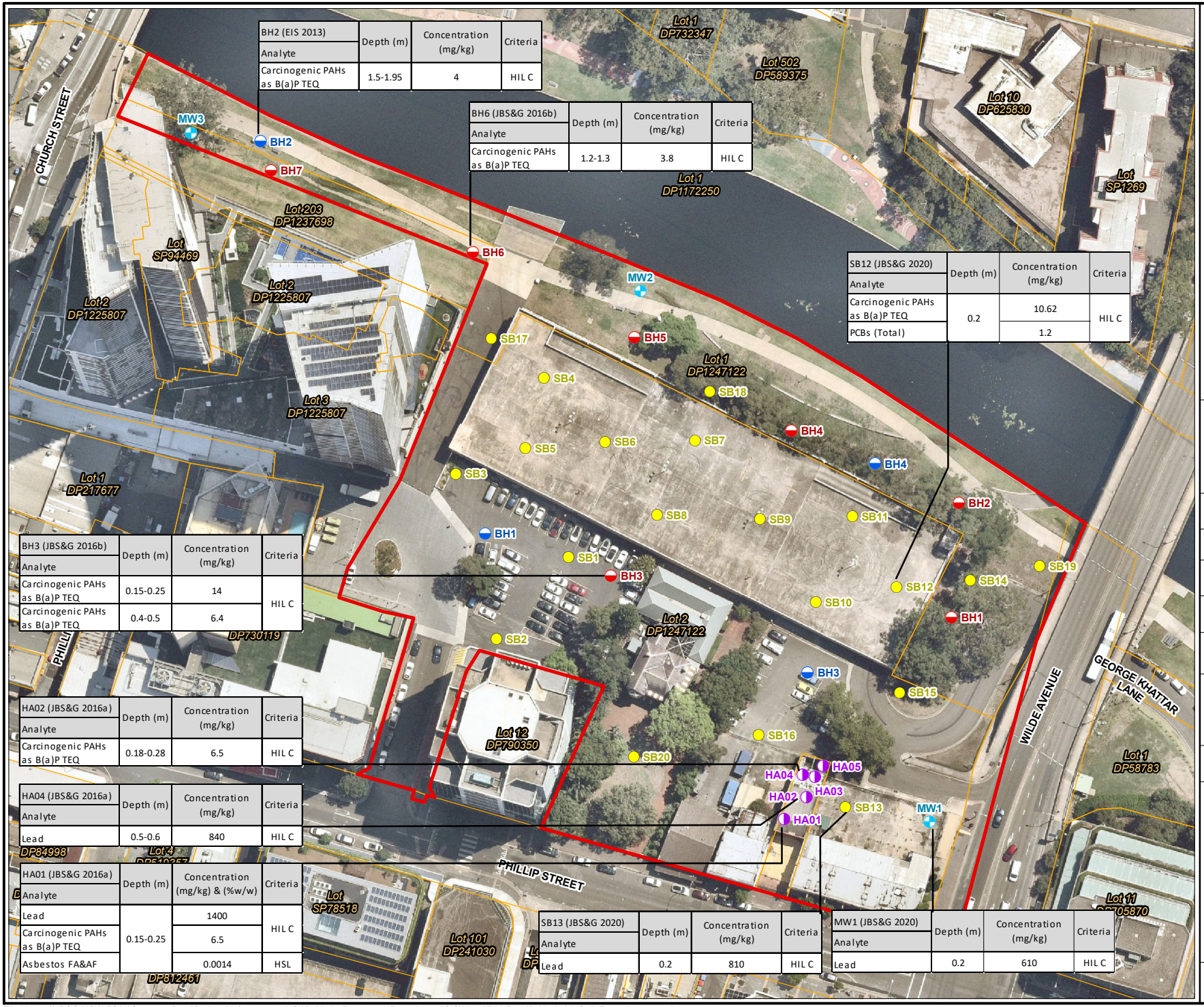
Coord. Sys. GDA 1994 MGA Zone 56

Phillip Street, Parramatta, NSW

SOIL AND GROUNDWATER SAMPLING LOCATIONS

FIGURE 3

File Name: N:\Projects\Infrastructure NSW\58352 - Parramatta Powerhouse\GIS\Maps\R02 Rev A\58352_03_Soil_GroundwaterSamplingLocations.mxd
Reference: www.nearmap.com - Imagery 22-01-2020



Legend:

- Approximate Site Boundary
- Cadastre (NSW DCS, 2020)

Sample Locations

- Sample Locations (EIS 2013)
- Sample Locations (JBS&G 2016a)
- Sample Locations (JBS&G 2016b)
- Groundwater Monitoring Well Locations (JBS&G 2020)
- Soil Bore Sample Locations (JBS&G 2020)

JBS&G

Job No: 58352	
Client: Infrastructure NSW	
Version: R02 Rev 0	Date 27/03/2020
Drawn By: RH/RF	Checked By: MP
Scale 1:1,255	

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Phillip Street, Parramatta, NSW

SOIL EXCEEDANCES (HIL C AND HSL)

FIGURE 4

File Name: \\JBSG-NSW-FS01\Company Data\Projects\Infrastructure NSW\58352 - Parramatta Powerhouse\GIS\Maps\R02 Rev A\58352_04_Soil_Exceedances.mxd
Reference: www.nearmap.com - Imagery 22-01-2020

Legend:

- Approximate Site Boundary
- Remediation Extent
- Cadastre (NSW DCS, 2020)

Proposed SIte Layout

- Exisiting Pathway
- Trees
- Powerhouse Museum
- PS1 Exhibitions
- Landscaped Areas
- Paved Areas

JBS&G

Job No: 58352	
Client: Infrastructure NSW	
Version: R02 Rev 0	Date 3/04/2020
Drawn By: RH/RF	Checked By: MP
Scale 1:1,256	

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Phillip Street, Parramatta, NSW

EXTENT OF REMEDIATION

FIGURE 5

File Name: \\JBSG-NSW-FS01\Company Data\Projects\Infrastructure NSW\58352 - Parramatta Powerhouse\GIS\Maps\R02 Rev A\58352_05_ExtentofSiteRemediation.mxd
Reference: www.nearmap.com - Imagery 22-01-2020

Summary Tables

Table A Soil Analytical Results - 2013-2020
Project Number: 58352
Project Name: Parramatta Powerhouse

							Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEXN							Polycyclic Aromatic Hydrocarbons																				
Field ID	Date	Soil Type	Depth	Location	Lab Report	Reference	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Carcinogenic PAHs as B(a)P TEQ	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	PAHs (Total)	Pyrene	4,4-DDE
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							2	0.4	5	5	5	0.1	5	5	20	20	50	50	50	50	100	100	100	50	20	20	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.05
NEPM 2013 EIL - Urban Residential and public open space (generic)							100		190	60	1100		30	70																			170																					
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																					300	2800		120		180	50	70	85			105						0.7																
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																					1300	5600		120		180	65	125	105			45						0.7																
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Recreational - HSL C																																																						
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																																																						
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Coarse																				1000	2500	10000			700																													
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																				1000	3500	10000			800																													
NEPM 2013 Soil HIL C							300	90	300	17000	600	80	1200	30000																									3	3	3						3					300		
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 0 to <1m																								NL		310	4	NL	NL			NL	NL																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 1 to <2m																								NL		480	6	NL	NL			NL	NL																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 2 to <4m																								NL		NL	9	NL	NL			NL	NL																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 4m+																								NL		NL	20	NL	NL			NL	NL																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																								NL		260	3	NL	NL			230	NL																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																								NL		370	3	NL	NL			NL	NL																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 2 to <4m																								NL		630	3	NL	NL			NL	NL																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 4m+																								NL		NL	3	NL	NL			NL	NL																					
DSI (JBS&G 2020)																																																						
MW1_0.2	28/02/2020	Clay	0.2	Private Commercial Carpark	705373	JBS&G (2020)	7.9	0.5	17	43	610	0.3	11	300	<LOR	<LOR	52	69	121	<LOR	<LOR	120	120	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
MW1_0.5	28/02/2020	Clay	0.5	Private Commercial Carpark	705373	JBS&G (2020)	8.6	<LOR	30	44	75	0.1	8	60	<LOR	180	720	96	996	400	590	<LOR	990	400	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.7	<LOR	<LOR	0.5	1.8	0.6	-
MW2_0.1	28/02/2020	Sand	0.1	Grassed Foreshore	705373	JBS&G (2020)	4.8	<LOR	13	55	70	<LOR	11	190	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.7	0.8	1.1	1.4	<LOR	<LOR	0.6	0.6	<LOR	1.094	1	<LOR	<LOR	<LOR	3.8	0.9	-
MW2_4.0	28/02/2020	Sand	4.0	Grassed Foreshore	705373	JBS&G (2020)	4.4	<LOR	19	7	14	<LOR	6.8	32	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
MW3_0.1	28/02/2020	Sand	0.1	Grassed Foreshore	705373	JBS&G (2020)	2.9	<LOR	7.7	9.5	13	<LOR	5	45	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
MW3_1.0	28/02/2020	Silt	1.0	Grassed Foreshore	705373	JBS&G (2020)	3.8	<LOR	8.3	18	21	<LOR	6.9	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB1_0.2	28/02/2020	Silt	0.2	On-grade open asphalt carpark	705373	JBS&G (2020)	<LOR	<LOR	70	79	17	<LOR	80	89	<LOR	<LOR	56	110	166	<LOR	130	170	300	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB1_1.5	28/02/2020	Sand	1.5	On-grade open asphalt carpark	705373	JBS&G (2020)	2.7	<LOR	7.4	9.3	7.8	<LOR	5.2	16	<LOR	<LOR	<LOR	80	80	<LOR	<LOR	160	160	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB2_1.0	28/02/2020	Silt	1.0	On-grade open asphalt carpark	705373	JBS&G (2020)	3.8	<LOR	22	46	190	0.4	20	140	<LOR	<LOR	<LOR	110	110	<LOR	110	170	280	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1	1	1.4	1.6	1.9	0.8	0.7	0.9	0.9	<LOR	1.646	1.5	<LOR	1.1	0.6	10.1	1.6	-
SB3_0.2	28/02/2020	Silt	0.2	On-grade open asphalt carpark	705373	JBS&G (2020)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB3_1.0	28/02/2020	Clay	1.0	On-grade open asphalt carpark	705373	JBS&G (2020)	5.2	<LOR	12	13	16	<LOR	5.3	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
QS01 (duplicate pair SB3_1.5)	28/02/2020	Clay	1.5	On-grade open asphalt carpark	705373	JBS&G (2020)	5.4	<LOR	11	19	16	<LOR	7.5	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
QS01a (triplicate pair SB3_1.5)	28/02/2020	Clay	1.5	On-grade open asphalt carpark	237935	JBS&G (2020)	5	<LOR	10	14	14	<LOR	5	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB4_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	JBS&G (2020)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4_0.5	28/02/2020	Silt	0.5	Multi-Storey Carpark	705373	JBS&G (2020)	3.7	<LOR	13	29	88	0.3	36	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	0.8	0.8	1	1.3	1.6	0.5	0.8	<LOR	0.6	<LOR	1.319	1.1	<LOR	1	0.5	6.1	<LOR	-
SB5_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	JBS&G (2020)	<LOR	<LOR	14	68	17	<LOR	46	69	<LOR	<LOR	<LOR	1100	1100	<LOR	1200	1400	2600	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.4	1	1.5	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB5_1.0	28/02/2020	Clay	1.0	Multi-Storey Carpark	705373	JBS&G (2020)	7.1	<LOR	12	15	16	<LOR	10	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB6_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	JBS&G (2020)	<LOR	<LOR	11	57	11	<LOR	67	52	<LOR	<LOR	<LOR	1200	1200	<LOR	1200	1500	2700	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.5	1.1	1.6	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB7_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	JBS&G (2020)	4	<LOR	13	34	130	0.5	15	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	1.4	1.1	1.5	1.8	2	1	0.8	0.8	1.1	<LOR	1.799	2.4	<LOR	1.1	1.1	13	2.2	-
SB7_1.0	28/02/2020	Silt	1.0	Multi-Storey Carpark	705373	JBS&G (2020)	2.6	<LOR	6.9	8.5	33	0.1	<LOR	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
QS02 (duplicate pair SB7_1.0)	28/02/2020	Silt	1.0	Multi-Storey Carpark	705373	JBS&G (2020)	3.5	<LOR	7.8	11	66	0.2	<LOR	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
QS02a (triplicate pair SB7_1.0)	28/02/2020	Silt	1.0	Multi-Storey Carpark	237935	JBS&G (2020)	<4	<LOR	5	9	35	<LOR	3	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB8_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	JBS&G (2020)	<LOR	<LOR	14	74	7.5	<LOR	66	52	<LOR	<LOR	<LOR	1100	1100	<LOR	1300	970	2270	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1	2.3	3.3	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB8_1.0	28/02/2020	Sand	1.0	Multi-Storey Carpark	705373	JBS&G (2020)	<LOR	<LOR	5.3	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
QS03 (duplicate pair SB8_1.0)	28/02/2020	Sand	1.0	Multi-Storey Carpark	705373	JBS&G (2020)	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
QS03a (triplicate pair SB8_1.0)	28/02/2020	Sand	1.0	Multi-Storey Carpark	237935	JBS&G (2020)	<4	<LOR	3	2	4	<LOR	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB9_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	JBS&G (2020)	6.6	<LOR	13	39	280	0.6	9.1	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	1.4	1.1	1.5	1.8	2	1	0.7	0.8	1	<LOR	1.8	2.6	<LOR	0.9	1.7	13.5	2.3	-
SB10_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	JBS&G (2020)	<LOR	<LOR	16	69	5.4	<LOR	95	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB11_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	JBS&G (2020)	6.7	<LOR	18	38	130	0.3	9.6	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	0.8	0.6	0.8	1.1	1.4	0.5	<LOR	<LOR	0.5	<LOR	1.073	1.1	<LOR	0.6	<LOR	5.2	1.1	-
SB12_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	JBS&G (2020)	<LOR	<LOR	24	110	51	<LOR	130	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	6.3	7.5	9.5	11	12	5.5	5.8	<LOR	<LOR	<LOR	10.62	<LOR	<LOR	7.7	<LOR	44.8	12	<LOR
SB13_0.2	28/02/2020	Silt	0.2	Private Commercial Carpark	705373	JBS&G (2020)	8.2	0.6	38	90	810	2.5	20	340	<LOR	<LOR	56	70	126	<LOR	<LOR	130	130	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1.8	1.3	1.8	2.1	2.3	1.1	0.9	0.9	1.4	<LOR	2.073	2.1	<LOR	1.2	0.7	13.7	2.3	<LOR
SB13_0.5	28/02/2020	Clay	0.5	Private Commercial Carpark	705373	JBS&G (2020)	7.3	<LOR	20	17	27	<LOR	7.7	26	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB14_0.5	28/02/2020	Clay	0.5	East of Multi-Storey Carpark	705373	JBS&G (2020)	7.6	<LOR	13	17	90	0.1	6.9	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	1.2	0.8	1.2	1.4	1.7	0.7	0.6	0.7	0.9	<LOR	1.405	1.6	<LOR	0.8	<LOR	8.9	1.6	-
SB15_1.5	28/02/2020	Clay	1.5	South-East of Multi-Storey Carpark	705373	JBS&G (2020)	3.8	<LOR	17	25	62	0.1	11	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB16_0.3	28/02/2020	Silt	0.3	On-grade open asphalt carpark	705373	JBS&G (2020)	3.8	<LOR	20	25	130	0.3	19	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	0.8	0.6	0.8	1	1.4	<LOR	<LOR	<LOR	0.6	<LOR	1.049	1	<LOR	0.6	<LOR	4.5	0.9	-
SB17_1.0	28/02/2020	Silt	1.0	West of Multi-Storey Carpark	705373	JBS&G (2020)	5.1	<LOR	11	15	30	<LOR	7.9	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	0.6	0.9	0.7	1	1.2	1.5	0.6	0.6	0.5	0.6	<LOR	1.242	1.5	<LOR	0.8	0.7	8.9	1.4	-
SB18_0.1	28/02/2020	Silt	0.1	Grassed Foreshore	705373	JBS&G (2020)	3.1	<LOR	20	43	41	<LOR	75	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB18_1.5	28/02/2020	Silt	1.5	Grassed Foreshore	705373	JBS&G (2020)	2.3	<LOR	5.8	14	19	0.2	8.6	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB19_1.0	28/02/2020	Silt	1.0	Grassed Foreshore	705373	JBS&G (2020)	3.7	<LOR	8.1	12	22	<LOR	11	33	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-
SB19_1.5	28/02/2020	Silt	1.5	Grassed Foreshore	705373	JBS&G (2020)	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB20_0.2	28/02/2020	Silt	0.2	Grassed open space, south of carpark	705373	JBS&G (2020)	6	<LOR	19	41	250	0.3	15	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	0.6	0.6	0.7	1	1.3	<LOR	<LOR	<LOR	0.5	<LOR	0.9925	<LOR	<LOR	<LOR	0.6	3.4	1.1	-
PSI (JBS&G 2016b)																																																						
BH1 0-0.1	12/08/2016	Sand	0-0.1	East of Multi-Storey Carpark	511735	JBS&G (2016b)	3.2	<LOR	8.7	22	70	0.07	6.7	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1 0.3-0.4	12/08/2016	Sand	0.3-0.4	East of Multi-Storey Carpark	511735	JBS&G (2016b)	4	<LOR	9	17	65	0.09	6	66	<LOR	<LOR	55	<LOR	55	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.5	0.9	1	1.3	1.6	1.8	1.1	0.5	0.6	1	<LOR	-	2	<LOR	<LOR	1.5	10.9	1.8	<LOR
BH1 0.7-0.8	12/08/2016	Sand	0.7-0.8	East of Multi-Storey Carpark	511735	JBS&G (2016b)	-	-	-	-	-	-	-	-	<LOR	<LOR	91	57	148	<LOR	130	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.9	1.1	1.6	2.2	2.4	2.7	2.2	1.1	1.3	1.4	<LOR	-	2.3	<LOR	0.9	0.9	15.8	2.1	-
BH1 1.1-1.2	12/08/2016	Clay	1.1-1.2	East of Multi-Storey Carpark	511735	JBS&G (2016b)	3.1	<LOR	6.2	9.4	22	0.1	<LOR	28	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
BH2 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	JBS&G (2016b)	<LOR	<LOR	11	45	15	<LOR	81	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01 (duplicate pair BH2 0-0.1)	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	JBS&G (2016b)	2.5	<LOR	5.8	15	81	0.13	7.6	95	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
QC01A (triplicate pair BH2 0-0.1)	12/08/2016	Sand	0-0.1	Grassed Foreshore	151821	JBS&G (2016b)	<4	<LOR	10	56	25	<LOR	41	50	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	0.06	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.1	<LOR	-	0.1	<LOR	<LOR	<LOR	-	0.2	<LOR
BH2 0.5-0.6	12/08/2016	Sand	0.5-0.6	Grassed Foreshore	511735	JBS&G (2016b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3 0.15-0.25	12/08/2016	Sand	0.15-0.25	On-grade open asphalt carpark	511735	JBS&G (2016b)	5.1	<LOR	15	61	250	0.6	17	210	<LOR	<LOR	390	250	640	<LOR	580	140	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1.3	5.4	9.2	14	14	14	8.7	6.7	5.5	6.2	2.1	-	9.8	<LOR	4.90	4.00	73.8	10	<LOR
BH3 0.4-0.5	12/08/2016	Sand	0.4-0.5	On-grade open asphalt carpark	511735	JBS&G (2016b)	4.1	<LOR	10	66	140	0.59	7.5	130	<LOR	<LOR	130	82	212	<LOR	190	<LOR	-	<LOR	<LOR	<LOR	-	-	-	-	-	-	<LOR	<LOR	0.90	1.70	4.80	4.5	5.90	6.20	6.40	3.40	2.60	3.10	4.60	<LOR	-	11	<LOR	2.30	7.00	55.6	9.7	-
BH3 0.8-0.9	12/08/2016	Clay	0.8-0.9	On-grade open asphalt carpark	511735	JBS&G (2016b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	0.60	0.6	0.80	1.10	1.40	0.70	<LOR	0.70	0.70	<LOR	-	1.1	<LOR	<LOR	<LOR	5.50	1.10	-
BH4 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	JBS&G (2016b)	<LOR	<LOR	9.3	32	6.7	<LOR	62	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4 0.2-0.3	12/08/2016	Sand	0.2-0.3	Grassed Foreshore	511735	JBS&G (2016b)	2.6	<LOR	5.6	22	37	0.09	13	45	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	-	0.8	<LOR	<LOR	<LOR	1.6	0.8	<LOR
BH5 0.1-0.2	12/08/2016	Sand	0.1-0.2	Grassed Foreshore	511735	JBS&G (2016b)	<LOR	<LOR	12	35	11	0.18	88	43	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
BH6 0.3-0.4	12/08/2016	Clay	0.3-0.4	Grassed Foreshore	511735	JBS&G (2016b)	3.6	0.4	9.2	30	62	0.08	7.2	190	<LOR	<LOR	69	110	179	<LOR	150	110	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.8	1	1.3	1.6	1.8	1	0.9	0.8	1	<LOR	-	1.8	<LOR	0.7	1.1	10.9	1.8	<LOR
BH6 1.2-1.3	12/08/2016	Clay	1.2-1.3	Grassed Foreshore	511735	JBS&G (2016b)	-	-	-	-	-	-	-	-	<LOR	<LOR	100	57	157	<LOR	140	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.9	1.9	2.3	3.8	3.8	3.8	3.1	2.3	2.2	2.2	0.6	-	5.0	<LOR	1.6	2.7	29.4	4.6	-
BH6 1.5-1.6	12/08/2016	Clay	1.5-1.6	Grassed Foreshore	511735	JBS&G (2016b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	1.10	1.10	1.50	1.70	2.00	0.90	0.70	1.00	1.30	<LOR	-	2.6	<LOR	0.6	7	12.7	9.7	-
BH7 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	JBS&G (2016b)	2.9	<LOR	7.2	19	26	<LOR	6.7	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7 0.5-0.6	12/08/2016	Sand	0.5-0.6	Grassed Foreshore	511735	JBS&G (2016b)	6.1	0.4	12	140	64	0.08	9.7	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7 1.1-1.2	12/08/2016	Clay	1.1-1.2	Grassed Foreshore	511735	JBS&G (2016b)	2.5	<LOR	5.3	8.8	24	<LOR	<LOR	73	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.5	0.7	0.9	1.2	1.4	0.6	<LOR	0.6	0.6	<LOR	-	1	<LOR	<LOR	<LOR	5.1	1.1	<LOR
BH7 1.7-1.8	12/08/2016	Clay	1.7-1.8	Grassed Foreshore	511735	JBS&G (2016b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PSI & DSI (JBS&G 2016a)																																																					
HA01_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	JBS&G (2016a)	11	1.5	19	82	1400	0.87	13	820	<LOR	<LOR	190	150	340	<LOR	310	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1.5	1.5	6.4	4.5	6	6.2	6.5	2.5	-	2.7	3.2	3.9	-	13	<LOR	2.2	3.4	57	11	-
HA01_0.5-0.6	12/08/2015	Clay	0.5-0.6	South-Eastern portion of site	468475	JBS&G (2016a)	3.6	<LOR	6.8	8.3	62	0.19	<LOR	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	1.4	0.8	1.1	1.4	1.6	0.7	-	<LOR	0.6	0.7	-	-	-	-	-	8.7	-	-
HA02_0.18-0.28	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	468475	JBS&G (2016a)	20	0.9	22	79	390	1.1	21	530	<LOR	<LOR	91	<LOR	91	<LOR	130	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1.5	1.3	1.5	1.8	2.1	<LOR	0.9	<LOR	0.8	<LOR	-	3.3	<LOR	0.7	0.9	12	2.8	<LOR
QA01 (triplicate of HA02_0.18-0.28)	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	132652	JBS&G (2016a)	8	0.5	18	67	510	1	17	400	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	0.3	0.4	1.7	1.7	2.4	2.4	2.4	-	0.8	-	1.4	0.2	-	3.3	<LOR	1	1.2	18	2.9	<LOR
QC01 (duplicate of HA02_0.18-0.28)	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	468475	JBS&G (2016a)	5.3	0.5	12	240	140	0.21	7.3	210	<LOR	<LOR	130	80	210	<LOR	190	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.7	1.2	4.5	4.8	5.8	6.1	6.3	1.5	2.6	1.6	2.6	<LOR	-	9.2	<LOR	2.2	3.5	43	8.3	<LOR
HA03_0.16-0.26	12/08/2015	Clay	0.16-0.26	South-Eastern portion of site	468475	JBS&G (2016a)	4.9	1.1	15	34	450	0.51	7	410	<LOR	<LOR	82	<LOR	82	<LOR	110	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1.1	1.1	1.2	1.5	1.9	<LOR	<LOR	<LOR	0.7	<LOR	-	2.2	<LOR	<LOR	0.7	7.7	1.9	-
HA04_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	JBS&G (2016a)	3.2	0.8	15	24	85	0.1	<LOR	110	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.8	0.8	1.2	1.5	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	0.8	<LOR	<LOR
HA04_0.5-0.6	12/08/2015	Clay	0.5-0.6	South-Eastern portion of site	468475	JBS&G (2016a)	5.4	0.9	7.4	62	840	0.43	17	510	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.9	0.9	1.3	1.6	<LOR	<LOR	<LOR	<LOR	<LOR	-	0.7	<LOR	<LOR	<LOR	1.6	<LOR	-
HA05_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	JBS&G (2016a)	2.6	1.1	19	75	400	1	11	490	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	1.2	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Phase 1 ESA (EIS 2019)																																																					
BH1_0.1-0.2	23/09/2013	Sand	0.1-0.2	On-grade open asphalt carpark	97794	EIS (2013)	<LOR	<LOR	4	82	2	<LOR	21	24	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	-
BH1_0.5-0.95	23/09/2013	Sand	0.5-0.95	On-grade open asphalt carpark	97794	EIS (2013)	<LOR	<LOR	3	3	4	<LOR	2	6	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	-
BH2_0.5-0.95	23/09/2013	Silt	0.5-0.95	Grassed Foreshore	97794	EIS (2013)	5	0.4	14	23	73	0.1	8	320	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	130	<LOR	130	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.2	0.4	1.7	2.1	-	-	-	-	1.4	-	1.6	0.1	3	4.7	0.2	1.6	2.7	24	4.4	-
BH2_1.5-1.95	23/09/2013	Sand	1.5-1.95	Grassed Foreshore	97794	EIS (2013)	<LOR	<LOR	13	15	46	0.1	3	49	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	170	<LOR	170	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.2	0.3	2	2.6	-	-	-	-	1.6	-	2	0.2	4	4.2	<LOR	1.7	1.5	24	4	-
BH3_0.15-0.3	23/09/2013	Sand	0.15-0.3	On-grade open asphalt carpark	97794	EIS (2013)	<LOR	<LOR	9	10	30	<LOR	4	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.08	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	0.1	<LOR	<LOR	<LOR	0.37	0.1	-
BH3_0.5-0.95	23/09/2013	Clay	0.5-0.95	On-grade open asphalt carpark	97794	EIS (2013)	5	<LOR	15	13	14	<LOR	5	19	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	-
BH4_0-0.2	23/09/2013	Silt	0-0.2	Grassed Foreshore	97794	EIS (2013)	<LOR	<LOR	14	29	33	<LOR	37	100	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.1	<LOR	0.2	0.28	-	-	-	-	0.2	-	0.2	<LOR	<LOR	0.3	<LOR	0.2	0.1	2.3	0.4	-
BH4_1.5-1.95	23/09/2013	Sand	1.5-1.95	Grassed Foreshore	97794	EIS (2013)	4	<LOR	5	5	9	<LOR	7	7	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	-

Table A Soil Analytical Results - 2013-2020
Project Number: 58352
Project Name: Parramatta Powerhouse

						Organochlorine Pesticides																					Chlorinated Alkanes									
						Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	beta-BHC	Chlordane	DDD	DDT	Dieldrin	DDT+DDE+DDD (Sum of Total)	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL - Urban Residential and public open space (generic)												180																								
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																																				
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																																				
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Recreational - HSL C																																				
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																																				
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Coarse																																				
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																				
NEPM 2013 Soil HIL C							10			70				400					20			10			400	30										
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 0 to <1m																																				
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 1 to <2m																																				
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 2 to <4m																																				
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 4m+																																				
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																																				
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																																				
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 2 to <4m																																				
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 4m+																																				
Field ID	**Date**	**Soil Type**	**Depth**	**Location**	**Lab Report**																															
DSI (JBS&G 2020)																																				
MW1_0.2	28/02/2020	Clay	0.2	Private Commercial Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
MW1_0.5	28/02/2020	Clay	0.5	Private Commercial Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
MW2_0.1	28/02/2020	Sand	0.1	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
MW2_4.0	28/02/2020	Sand	4.0	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
MW3_0.1	28/02/2020	Sand	0.1	Grassed Foreshore	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
MW3_1.0	28/02/2020	Silt	1.0	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB1_0.2	28/02/2020	Silt	0.2	On-grade open asphalt carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB1_1.5	28/02/2020	Sand	1.5	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB2_1.0	28/02/2020	Silt	1.0	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB3_0.2	28/02/2020	Silt	0.2	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB3_1.0	28/02/2020	Clay	1.0	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QS01 (duplicate pair SB3_1.5)	28/02/2020	Clay	1.5	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QS01a (triplicate pair SB3_1.5)	28/02/2020	Clay	1.5	On-grade open asphalt carpark	237935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4_0.5	28/02/2020	Silt	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB5_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB5_1.0	28/02/2020	Clay	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB7_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB7_1.0	28/02/2020	Silt	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QS02 (duplicate pair SB7_1.0)	28/02/2020	Silt	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QS02a (triplicate pair SB7_1.0)	28/02/2020	Silt	1.0	Multi-Storey Carpark	237935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB8_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB8_1.0	28/02/2020	Sand	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QS03 (duplicate pair SB8_1.0)	28/02/2020	Sand	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QS03a (triplicate pair SB8_1.0)	28/02/2020	Sand	1.0	Multi-Storey Carpark	237935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB9_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB10_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB11_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB12_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
SB13_0.2	28/02/2020	Silt	0.2	Private Commercial Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB13_0.5	28/02/2020	Clay	0.5	Private Commercial Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB14_0.5	28/02/2020	Clay	0.5	East of Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB15_1.5	28/02/2020	Clay	1.5	South-East of Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB16_0.3	28/02/2020	Silt	0.3	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB17_1.0	28/02/2020	Silt	1.0	West of Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB18_0.1	28/02/2020	Silt	0.1	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB18_1.5	28/02/2020	Silt	1.5	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB19_1.0	28/02/2020	Silt	1.0	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB19_1.5	28/02/2020	Silt	1.5	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
SB20_0.2	28/02/2020	Silt	0.2	Grassed open space, south of carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PSI (JBS&G 2016b)																																				
BH1 0-0.1	12/08/2016	Sand	0-0.1	East of Multi-Storey Carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1 0.3-0.4	12/08/2016	Sand	0.3-0.4	East of Multi-Storey Carpark	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
BH1 0.7-0.8	12/08/2016	Sand	0.7-0.8	East of Multi-Storey Carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1 1.1-1.2	12/08/2016	Clay	1.1-1.2	East of Multi-Storey Carpark	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
BH2 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01 (duplicate pair BH2 0-0.1)	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
QC01A (triplicate pair BH2 0-0.1)	12/08/2016	Sand	0-0.1	Grassed Foreshore	151821	<LOR	-	<LOR	<LOR	-	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH2 0.5-0.6	12/08/2016	Sand	0.5-0.6	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3 0.15-0.25	12/08/2016	Sand	0.15-0.25	On-grade open asphalt carpark	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
BH3 0.4-0.5	12/08/2016	Sand	0.4-0.5	On-grade open asphalt carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3 0.8-0.9	12/08/2016	Clay	0.8-0.9	On-grade open asphalt carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4 0.2-0.3	12/08/2016	Sand	0.2-0.3	Grassed Foreshore	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
BH5 0.1-0.2	12/08/2016	Sand	0.1-0.2	Grassed Foreshore	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
BH6 0.3-0.4	12/08/2016	Clay	0.3-0.4	Grassed Foreshore	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
BH6 1.2-1.3	12/08/2016	Clay	1.2-1.3	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6 1.5-1.6	12/08/2016	Clay	1.5-1.6	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7 0.5-0.6	12/08/2016	Sand	0.5-0.6	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7 1.1-1.2	12/08/2016	Clay	1.1-1.2	Grassed Foreshore	511735	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
BH7 1.7-1.8	12/08/2016	Clay	1.7-1.8	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PSI & DSI (JBS&G 2016a)																																				
HA01_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA01_0.5-0.6	12/08/2015	Clay	0.5-0.6	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02_0.18-0.28	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	468475	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
QA01 (triplicate of HA02_0.18-0.28)	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	132652	<LOR	-	<LOR	<LOR	-	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-
QC01 (duplicate of HA02_0.18-0.28)	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	468475	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
HA03_0.16-0.26	12/08/2015	Clay	0.16-0.26	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA04_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
HA04_0.5-0.6	12/08/2015	Clay	0.5-0.6	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA05_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-
Phase 1 ESA (EIS 2019)																																				
BH1_0.1-0.2	23/09/2013	Sand	0.1-0.2	On-grade open asphalt carpark	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH1_0.5-0.95	23/09/2013	Sand	0.5-0.95	On-grade open asphalt carpark	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH2_0.5-0.95	23/09/2013	Silt	0.5-0.95	Grassed Foreshore	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH2_1.5-1.95	23/09/2013	Sand	1.5-1.95	Grassed Foreshore	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH3_0.15-0.3	23/09/2013	Sand	0.15-0.3	On-grade open asphalt carpark	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH3_0.5-0.95	23/09/2013	Clay	0.5-0.95	On-grade open asphalt carpark	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH4_0-0.2	23/09/2013	Silt	0-0.2	Grassed Foreshore	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
BH4_1.5-1.95	23/09/2013	Sand	1.5-1.95	Grassed Foreshore	97794	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-	-

Table A Soil Analytical Results - 2013-2020
Project Number: 58352
Project Name: Parramatta Powerhouse

												Chlorinated Alkenes											Solvents	Polychlorinated Biphenyls								Monocyclic Aromatic Hydrocarbons						Miscellaneous Hydrocarbons						Chlorinated Benzenes					Trihalomethanes								Other
						Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	1,3-dichloropropene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	2-Propanone (Acetone)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	Total MAH*	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Asbestos from ACM in soil	Asbestos from FA & AF in Soil	Carbon disulfide	% Moisture 103oC
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%w/w	%w/w	mg/kg	%
EQL						0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.05	0.5	0.5	0.5	0.5			0.5	1
NEPM 2013 EIL - Urban Residential and public open space (generic)																																																								
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																																																								
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																																																								
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Recreational - HSL C																																																								
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																																																				0.02	0.001		
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Coarse																																																								
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																																								
NEPM 2013 Soil HIL C																															1																	10								
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 0 to <1m																																																								
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 1 to <2m																																																								
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 2 to <4m																																																								
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 4m+																																																								
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																																																								
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																																																								
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 2 to <4m																																																								
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 4m+																																																								
Field ID	**Date**	**Soil Type**	**Depth**	**Location**	**Lab Report**																																																			
DSI (JBS&G 2020)																																																								
MW1_0.2	28/02/2020	Clay	0.2	Private Commercial Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	17
MW1_0.5	28/02/2020	Clay	0.5	Private Commercial Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	17
MW2_0.1	28/02/2020	Sand	0.1	Grassed Foreshore	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	13
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MW3_0.1	28/02/2020	Sand	0.1	Grassed Foreshore	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	13
MW3_1.0	28/02/2020	Silt	1.0	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
SB1_0.2	28/02/2020	Silt	0.2	On-grade open asphalt carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	8.5
SB1_1.5	28/02/2020	Sand	1.5	On-grade open asphalt carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	5
SB2_1.0	28/02/2020	Silt	1.0	On-grade open asphalt carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	11
SB3_0.2	28/02/2020	Silt	0.2	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	-
SB3_1.0	28/02/2020	Clay	1.0	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
QS01 (duplicate pair SB3_1.5)	28/02/2020	Clay	1.5	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
QS01a (triplicate pair SB3_1.5)	28/02/2020	Clay	1.5	On-grade open asphalt carpark	237935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	-
SB4_0.5	28/02/2020	Silt	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.3
SB5_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	1.4	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	6.6
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SB6_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1.6	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	5.2
SB7_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	15
SB7_1.0	28/02/2020	Silt	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.6
QS02 (duplicate pair SB7_1.0)	28/02/2020	Silt	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.7
QS02a (triplicate pair SB7_1.0)	28/02/2020	Silt	1.0	Multi-Storey Carpark	237935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB8_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	3.3	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	5.7
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QS03 (duplicate pair SB8_1.0)	28/02/2020	Sand	1.0	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.4
QS03a (triplicate pair SB8_1.0)	28/02/2020	Sand	1.0	Multi-Storey Carpark	237935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB9_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	12
SB10_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	4.3
SB11_0.5	28/02/2020	Clay	0.5	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	12
SB12_0.2	28/02/2020	Silt	0.2	Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	1.2	<LOR	<LOR	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	4.2
SB13_0.2	28/02/2020	Silt	0.2	Private Commercial Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	16
SB13_0.5	28/02/2020	Clay	0.5	Private Commercial Carpark	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	16
SB14_0.5	28/02/2020	Clay	0.5	East of Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	9.4
SB15_1.5	28/02/2020	Clay	1.5	South-East of Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	11
SB16_0.3	28/02/2020	Silt	0.3	On-grade open asphalt carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	7.5
SB17_1.0	28/02/2020	Silt	1.0	West of Multi-Storey Carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	11
SB18_0.1	28/02/2020	Silt	0.1	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	12
SB18_1.5	28/02/2020	Silt	1.5	Grassed Foreshore	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.9
SB19_1.0	28/02/2020	Silt	1.0	Grassed Foreshore	705373	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	6.3
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SB20_0.2	28/02/2020	Silt	0.2	Grassed open space, south of carpark	705373	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	23
PSI (JBS&G 2016b)																																																								
BH1 0-0.1	12/08/2016	Sand	0-0.1	East of Multi-Storey Carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	30
BH1 0.3-0.4	12/08/2016	Sand	0.3-0.4	East of Multi-Storey Carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	7.9
BH1 0.7-0.8	12/08/2016	Sand	0.7-0.8	East of Multi-Storey Carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
BH1 1.1-1.2	12/08/2016	Clay	1.1-1.2	East of Multi-Storey Carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	-	-	-	14
BH2 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	10
QC01 (duplicate pair BH2 0-0.1)	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	11
QC01A (triplicate pair BH2 0-0.1)	12/08/2016	Sand	0-0.1	Grassed Foreshore	151821	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	-
BH2 0.5-0.6	12/08/2016	Sand	0.5-0.6	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
BH3 0.15-0.25	12/08/2016	Sand	0.15-0.25	On-grade open asphalt carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	11
BH3 0.4-0.5	12/08/2016	Sand	0.4-0.5	On-grade open asphalt carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
BH3 0.8-0.9	12/08/2016	Clay	0.8-0.9	On-grade open asphalt carpark	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
BH4 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.6
BH4 0.2-0.3	12/08/2016	Sand	0.2-0.3	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	11
BH5 0.1-0.2	12/08/2016	Sand	0.1-0.2	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	9.9
BH6 0.3-0.4	12/08/2016	Clay	0.3-0.4	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	13
BH6 1.2-1.3	12/08/2016	Clay	1.2-1.3	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
BH6 1.5-1.6	12/08/2016	Clay	1.5-1.6	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7 0-0.1	12/08/2016	Sand	0-0.1	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	15
BH7 0.5-0.6	12/08/2016	Sand	0.5-0.6	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
BH7 1.1-1.2	12/08/2016	Clay	1.1-1.2	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	-	-	-	15
BH7 1.7-1.8	12/08/2016	Clay	1.7-1.8	Grassed Foreshore	511735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
PSI & DSI (JBS&G 2016a)																																																								
HA01_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	0.0014	-	18
HA01_0.5-0.6	12/08/2015	Clay	0.5-0.6	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02_0.18-0.28	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	23
QA01 (triplicate of HA02_0.18-0.28)	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	132652	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	-	-	-	-
QC01 (duplicate of HA02_0.18-0.28)	12/08/2015	Clay	0.18-0.28	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	-
HA03_0.16-0.26	12/08/2015	Clay	0.16-0.26	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	15
HA04_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	15
HA04_0.5-0.6	12/08/2015	Clay	0.5-0.6	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	-
HA05_0.15-0.25	12/08/2015	Clay	0.15-0.25	South-Eastern portion of site	468475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	-
Phase 1 ESA (EIS 2019)																																																								
BH1_0.1-0.2	23/09/2013	Sand	0.1-0.2	On-grade open asphalt carpark	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	11
BH1_0.5-0.95	23/09/2013	Sand	0.5-0.95	On-grade open asphalt carpark	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.1
BH2_0.5-0.95	23/09/2013	Silt	0.5-0.95	Grassed Foreshore	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	10
BH2_1.5-1.95	23/09/2013	Sand	1.5-1.95	Grassed Foreshore	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
BH3_0.15-0.3	23/09/2013	Sand	0.15-0.3	On-grade open asphalt carpark	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	9.1
BH3_0.5-0.95	23/09/2013	Clay	0.5-0.95	On-grade open asphalt carpark	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
BH4_0-0.2	23/09/2013	Silt	0-0.2	Grassed Foreshore	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	-	8.8
BH4_1.5-1.95	23/09/2013	Sand	1.5-1.95	Grassed Foreshore	97794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17

Table B: Groundwater Field Parameters
Parramatta Powerhouse

Well ID	Sample Date	Total Well Depth	Depth to Water	Depth to LNAPL	Vapour Well Head	Electrical Conductivity	pH	Dissolved Oxygen	Temperature	Redox
		m TOC	m TOC	m	ppm	µs/cm	-	mg/L	˚C	mV
MW1	6/03/2020	6.020	3.682	-	5.4	817	7.34	1.64	24.9	661.4
MW2	6/03/2020	4.100	1.334	-	5.7	922	7.10	0.10	24	-120.6
MW3	6/03/2020	4.030	1.981	-	1.0	1188	7.19	0.16	24.1	-124.3
BH1	6/03/2020	6.03	4.950	-	0.0	1121	6.75	0.15	25.4	-96.7
BH4	6/03/2020	4.5	1.390	-	0.0	1710	6.28	0.25	23.5	-39.3

Table B: Groundwater Field Parameters
Parramatta Powerhouse

Comments
Clear, very low turbidity, no sheen, no odour
Brown/grey, moderate turbidity, no sheen, no odour
Grey, moderate turbidity, no sheen, no odour
Dark grey, high turbidity, no sheen, no odour
Clear, very low turbidity, no sheen, no odour

Table C: 2013-2020 Groundwater Analytical Results
Project Number: 58352
Project Name: Parramatta Powerhouse

			Heavy Metals								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEXN						
			Arsenic (Total)	Cadmium	Chromium (Total) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Inorganic) (Filtered)	Nickel (Filtered)	Zinc (Filtered)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Naphthalene
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001	0.01	0.05	0.1	0.1	0.1	0.05	0.1	0.1	0.1	0.05	0.01	0.01	0.001	0.001	0.001	0.001	0.002	0.003	0.00001
ANZG (2018) Freshwater and Marine water 95% toxicant DGVs				0.0002		0.0013	0.0034	0.0004	0.011	0.008													0.7	0.08	0.18	0.35	0.07		0.016
NEPM 2013 Groundwater HSL C for Vapour Intrusion - Sand 2 to <4m																				NL		NL	NL	NL	NL			NL	NL
NEPM 2013 Groundwater HSL C for Vapour Intrusion - Sand 4 to <8m																				NL		NL	NL	NL	NL			NL	NL
Field ID	**Sample Date**	**Report Number**																											
DSI (JBS&G 2020)																													
BH1	6/03/2020	706429	0.005	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.003	<0.005	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00001
BH4	6/03/2020	706429	0.002	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00001
MW1	6/03/2020	706429	<0.001	<0.0002	0.002	0.001	<0.001	<0.0001	<0.001	0.01	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00001
QC01 (duplicate pair MW1)	6/03/2020	706429	<0.001	<0.0002	0.002	0.002	<0.001	<0.0001	<0.001	0.011	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00001
QC01A (triplicate pair MW1)	6/03/2020	238372	0.001	<0.0001	0.004	<0.001	<0.001	<0.00005	0.001	0.01	<0.01	<0.05	<0.1	<0.1	-	<0.05	<0.1	<0.1	-	<0.05	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.002	-	<0.0002
MW2	6/03/2020	706429	0.002	<0.0002	<0.001	0.001	<0.001	<0.0001	0.002	0.012	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00001
MW3	6/03/2020	706429	0.002	<0.0002	<0.001	0.002	<0.001	<0.0001	<0.001	0.078	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00001
Phase 1 ESA (EIS 2013)																													
MW1	30/09/2013		<0.001	<0.002	0.001	<0.002	<0.001	<0.00005	0.009	0.013	0.082	<0.05	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.0002
MW4	30/09/2013		0.001	<0.002	<0.001	<0.002	<0.001	<0.00005	0.002	0.017	<0.01	<0.05	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.0002

Table C: 2013-2020 Groundwater Analytical Results
Project Number: 58352
Project Name: Parramatta Powerhouse

	Polycyclic Aromatic Hydrocarbons																		Chlorinated Alkanes																			
	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[a]pyrene TEQ (WHO)	Benzo[b,j]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	PAHs (Total)	Pyrene	Total Positive PAHs	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.00001	0.00001	0.00001	0.00001	0.00001		0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001		0.001	0.001	0.001	0.001	0.001	0.001		0.001	0.001	0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001
ANZG (2018) Freshwater and Marine water 95% toxicant DGVs			0.0004		0.0002							0.0014					0.002					1.9															
NEPM 2013 Groundwater HSL C for Vapour Intrusion - Sand 2 to <4m																																				
NEPM 2013 Groundwater HSL C for Vapour Intrusion - Sand 4 to <8m																																				
Field ID	**Sample Date**	**Report Number**																																			
DSI (JBS&G 2020)																																					
BH1	6/03/2020	706429	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BH4	6/03/2020	706429	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW1	6/03/2020	706429	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
QC01 (duplicate pair MW1)	6/03/2020	706429	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
QC01A (triplicate pair MW1)	6/03/2020	238372	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	-	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	-	<0.01
MW2	6/03/2020	706429	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW3	6/03/2020	706429	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phase 1 ESA (EIS 2013)																																					
MW1	30/09/2013		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW4	30/09/2013		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C: 2013-2020 Groundwater Analytical Results
Project Number: 58352
Project Name: Parramatta Powerhouse

			Chlorinated Alkenes												Solvents	Monocyclic Aromatic Hydrocarbons										Miscellaneous Hydrocarbons							Chlorinated Benzenes							Trihalomethanes					
			1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	2-Propanone (Acetone)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Bromobenzene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Hexachlorobutadiene	Carbon disulfide
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.001			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1	0.001	0.001		0.001	0.001				0.001		0.001	0.001	0.001	0.001		0.001	0.001													0.001
ANZG (2018) Freshwater and Marine water 95% toxicant DGVs						0.003																										0.01	0.08	0.16	0.26	0.06			0.77				
NEPM 2013 Groundwater HSL C for Vapour Intrusion - Sand 2 to <4m																																											
NEPM 2013 Groundwater HSL C for Vapour Intrusion - Sand 4 to <8m																																											
Field ID	**Sample Date**	**Report Number**																																										
DSI (JBS&G 2020)																																											
BH1	6/03/2020	706429	<0.001	-	-	<0.001	<0.001	0.019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	2	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	-	<0.001
BH4	6/03/2020	706429	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	-	<0.001
MW1	6/03/2020	706429	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	2	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	-	<0.001
QC01 (duplicate pair MW1)	6/03/2020	706429	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	-	<0.001
QC01A (triplicate pair MW1)	6/03/2020	238372	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.01	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-
MW2	6/03/2020	706429	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	21	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.001	0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	-	0.001
MW3	6/03/2020	706429	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	3	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	-	<0.001
Phase 1 ESA (EIS 2013)																																											
MW1	30/09/2013		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW4	30/09/2013		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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0	Jessica Staehli Matthew Parkinson	Matthew Parkinson		03/04/2020

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