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Integrated Practical Solutions

Remediation Action Plan

Proposed Industrial Development
Westlink Stage 2, 1030-1064 Mamre Road
Kemps Creek

Prepared for
ESR Australia

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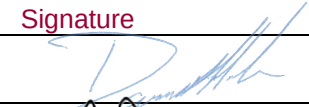
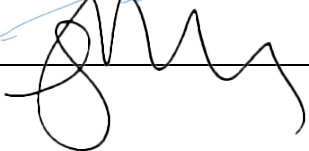
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Remediation Action Plan

Proposed Industrial Development

Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek

1. Introduction

Douglas Partners Pty Ltd (DP) has prepared this Remediation Action Plan (RAP) for the proposed industrial development known as Westlink Stage 2, located at 1030-1064 Mamre Road, Kemps Creek (the site). The site is shown on Drawing 1, Appendix A. It is understood that the plan will be used by ESR Australia (ESR) to support a development application for the proposed industrial warehouse development. The RAP was undertaken in general accordance with DP's proposal 211619.02.P.001.Rev0 dated 18 May 2022.

The following key guidelines were consulted in the preparation of this plan:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)* [NEPM] (NEPC, 2013);
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020); and
- CRC CARE *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives* (CRC CARE, 2019a).

The remediation objectives, devised with reference to CRC (2019a), are to:

- Address potentially unacceptable risks to relevant environmental values from contamination; and
- Render the site suitable, from a contamination perspective, for the proposed development.

This RAP provides details of the work that will be required at the site to meet the remediation objectives. It should be noted that this RAP does not form a detailed specification for the proposed site remediation works, but rather represents a planning document which outlines the means by which site remediation can be achieved.

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

2. Proposed Development

The proposed development is associated with Stage 2 of the ESR Westlink industrial warehouse development project. Stage 1 of the Westlink project extends to the north-west of site with the abutting portion of this land identified as Lot 11 in Deposited Plan 253503. It is understood that Stage 2 of the development is likely to comprise in the order of four medium to large industrial warehouse buildings (with associated offices, loading docks, car parking and access pavements), with building(s) at the eastern end of the site expected to extend onto Stage 1.

To allow construction of the building a series of level pads will be constructed with pad level relative to Australian Height Datum (AHD) reducing from east to west across the site, thereby following the natural topography. To allow for construction of these pads it is anticipated that significant cut and fill at the site will be required.

3. Scope of Work

The scope of works to achieve the objective is as follows:

- Summarise the findings of previous investigations used to inform the status of contamination and contamination risk at the site;
- Present a conceptual site model (CSM) to list potential and likely contamination source, pathway and receptor linkages and to address potentially unacceptable risks to relevant environmental values from contamination based on results from previous investigations and proposed works;
- Outline a process by which areas subject to remediation under this RAP will be identified and delineated;
- Assess, select and justify a preferred approach to management and/or remediation to render the site suitable for its proposed use, and which will minimise potentially unacceptable risks to human health and/or the environment;
- Select an appropriate (preferred) remediation strategy to render the site suitable, from a contamination perspective, for the proposed development;
- Establish the remediation acceptance criteria (RAC) to be adopted for validation of remediation;
- Identify how successful implementation of the RAP will be validated;
- Outline general waste classification, handling and tracking requirements;
- Provide general information on appropriate environmental safeguards required to complete the remediation works in an environmentally acceptable manner;
- Include contingency plans, an unexpected finds protocol and asbestos finds protocol; and
- Identify the need for, and nature of, any long-term management following the completion of remediation, if required.

4. Site Description

Site Address	Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek
Legal Description	Lot 3, Deposited Plan 250002 Lot 4, Deposited Plan 250002
Area	21.7 ha
Zoning	Zone IN1 General Industrial
Local Council Area	Penrith City Council

Current Use	1030-1048 Mamre Road: Rural, undeveloped 1050-1064 Mamre Road: Rural residential
Surrounding Uses	North: Rural / residential East: Rural / residential South: Rural / residential West: Mamre Road, then rural / residential

The site is currently occupied by two properties. The following was observed during the site walkover for the supplementary contamination investigation (SCI):¹

- 1030-1048 Mamre Road comprised a residential dwelling and unattached sheds at the centre of the site accessed via an unsealed access road off Mamre Road along the northern property boundary. The majority of the property was utilised as fenced off pens and open grass paddocks; and
- 1050-1064 Mamre Road comprised a vacant lot covered by grass with several stockpiles of soil ranging in volume and composition in the western third of the property. Refer to Drawings 1 and 2, Appendix A for the stockpile locations and identification numbers (as referred to in the SCI (DP, 2022b)).

The site layout is shown on Drawing 1, Appendix A.

5. Environmental Setting

Regional Topography	The eastern end of the site is located on a topographic high point at the end of a ridge line. The regional topography generally slopes west towards Kemps Creek.
Site Topography	The site currently falls from a reduced level (RL) of about 98 m AHD at the south-eastern corner of the site to about 44 m AHD at the western end of the site adjacent to Mamre Road.
Soil Landscape	The Penrith 1:100,000 Soils Landscape Sheet maps the site as Luddenham and Blacktown soil landscapes. The Luddenham soil landscape is classified as an erosional landscape with undulating to rolling low hills. The Blacktown soil landscape is classified as a residual landscape with gently undulating rises on Wianamatta Group shales.
Geology	The Penrith 1:100,000 Geology Sheet maps the site as Bringelly Shale of the Wianamatta Group. Bringelly Shale is characterised by shale, carbonaceous claystone, claystone, laminite and fine to medium-grained lithic sandstone.

¹ Douglas Partners Pty Ltd, 'Report on Supplementary Contamination Investigation, 1030-1064 Mamre Road, Kemps Creek, Proposed Industrial Development', DP ref: 211619.02.R.002.Rev0, dated 7 October 2022 (DP, 2022b).

Acid Sulfate Soils	Acid sulfate soil is not considered to be an issue of potential concern at the site based on the elevation and geology.
Surface Water	Surface water is expected to infiltrate into exposed soils or flow west downslope towards Kemps Creek which is present to the west of the site on the opposite side of Mamre Road.
Groundwater	Given the elevation and geology of the site, the regional groundwater at the site is expected to be at depth in the bedrock beneath the site and is anticipated to be saline with very low yield. Perched groundwater may be present along the ephemeral creek lines/ drainage lines and rivers at and near the site. A search of the Water NSW registered groundwater bore online database as part of previous investigations (refer to Section 6) did not identify any bores on the site or within 500 m of the site.

6. Previous Reports and Site History

6.1 Previous Reports

- DP (2021), 'Report on Pre-Purchase Due Diligence Preliminary Contamination Assessment, 1050-1064 Mamre Road, Kemps Creek, Proposed Industrial Development', DP ref: 207450.01.R.001.Rev0, dated 29 September 2021;
- DP (2022a), 'Report on Pre-Purchase Due Diligence Preliminary Contamination Assessment, 1030-1048 Mamre Road, Kemps Creek, Proposed Industrial Development', DP ref: 211619.01.R.001.Rev0, dated 30 March 2022; and
- DP (2022b), 'Report on Supplementary Contamination Investigation, 1030-1064 Mamre Road, Kemps Creek, Proposed Industrial Development', DP ref: 211619.02.R.002.Rev0, dated 7 October 2022.

For reference, summary tables of laboratory results from previous investigations (as outlined below) are provided in Appendix C whilst test pit and borehole logs from these investigations are provided in Appendix D. For more detailed information on the results and findings of previous investigations reference should be made to the relevant reports.

6.2 DP (2021)

The pre-purchase due diligence preliminary contamination assessment was undertaken to support ESR's purchase due diligence works for the property at 1050-1064 Mamre Road, Kemps Creek. It was understood that the report may also be used post purchase to support a development application for a proposed redevelopment comprising medium to large industrial buildings (with associated offices, loading docks, car parking and access pavements) should the purchase proceed. The objective of the assessment was to provide an indication on the risk of contamination at the site (with respect to the proposed land use) and the potential waste classification of soils for consideration as part of the due diligence.

The assessment comprised a limited desktop study supplemented with preliminary site investigation works which included excavation / auguring and associated soil sampling from two boreholes, 11 surface samples, and 19 test pits.

The site history information suggested that the site was acquired by the then owners in 1983 from previous land owners who potentially developed the site from a rural setting to rural residential setting sometime before 1986 and this had remained unchanged.

A judgemental sampling strategy to determine borehole and test pit locations was adopted given the preliminary due diligence nature of the assessment. Locations were based on site history information, the CSM, site walkover observations and to provide general site coverage in conjunction the geotechnical investigation (which was undertaken concurrently). In total 32 test locations were completed for the assessment. These borehole and test pit locations are shown on Drawings 3b and 3c, Appendix A.

The lithology encountered during the investigation was generally a silty clay topsoil overlying natural clays on siltstone bedrock. Inclusions of organic and rootlets along with ash (TP6 and BH21), charcoal (TP6), metal (BH21) and wood fragments (BH21) were also observed.

The results of the soil testing reported concentrations of total recoverable hydrocarbons (TRH), monocyclic aromatic hydrocarbons (benzene, toluene, ethylbenzene, xylene - BTEX), phenols, organochlorine pesticides (OCP), organophosphorus pesticides (OPP) and polychlorinated biphenyls (PCB) in the soil samples below the practical quantitation limit (PQL) and the respective site assessment criteria (SAC). Metals were detected in all soil samples and polycyclic aromatic hydrocarbons (PAH) were detected in some soil samples but were all at low concentrations and within the SAC.

No asbestos was detected in the soil samples analysed and no suspected asbestos-containing material (ACM) fragments were observed on the ground surface during the site walkover or in sample locations (noting the limitations of visual observations outlined in the report). However, it was noted that other anthropogenic materials were reported in the fill and this can be an indicator of potential ACM between sampled locations. Moreover, some areas were not available for sampling at the time of the investigation (i.e., around the residential house, storage container area, etc.).

The preliminary *in situ* waste classification for the fill material at the site was general solid waste (non-putrescible) and natural soil samples recorded results consistent with background ranges and below the adopted screening criteria for virgin excavated natural material (VENM).

The investigation generally concluded that the site could be made suitable the proposed industrial development from a contamination perspective although further assessment and targeted sampling of the following was required:

- Building footprints and surrounding areas of fill (following demolition);
- Footprints of the storage containers and adjacent miscellaneous items (following removal);
- Footprints of the former buildings / structures; and
- Footprint of the internal access road.

6.3 DP (2022a)

DP completed a pre-purchase due diligence preliminary contamination assessment for the property identified as 1030-1048 Mamre Road, Kemps Creek. Similar to DP (2021) it was understood that the report may also be used post purchase to support a development application for a proposed redevelopment comprising medium to large industrial buildings (with associated offices, loading docks, car parking and access pavements) should the purchase proceed. The objective of the assessment was to provide an indication on the risks of contamination at the site (with respect to the proposed industrial land use) for consideration as part of due diligence. The investigation was based on a limited site history search, site walkover and a limited number of additional test locations.

The site history information suggested that the site had remained rural / agricultural (grazing) since at least 1947 (if not earlier). Based on the titles search and historical aerial photographs, it is possible that the western portion of the site was used for market gardens during the late 1970s and through the 1980s. By 1994, the western portion of the site had undergone a significant amount of earthworks (including establishment of an access road and stockpiling of spoil) in preparation for what would be consistent with a residential development on the site (although no such development occurred). The site was acquired by the then owners in 1998 and the earthworks did not appear to continue beyond this time. The site remained, for the most part, unchanged since *circa* 2002.

A judgemental sampling strategy to determine borehole and test pit locations was adopted given the preliminary due diligence nature of the assessment. Locations were based on site history information, the CSM, site walkover observations and to provide general site coverage in conjunction the geotechnical investigation (which was undertaken concurrently). In total 23 test locations were completed for the assessment. These test pit locations are shown on Drawings 3a and 3c, Appendix A.

The lithology encountered during the investigation was generally a silty clay topsoil overlying alluvial and residual clays on siltstone bedrock. The stockpiles that were present at the western end of the site and were subject to sampling generally comprised clay fill with varying proportions of sand and gravel, building rubble in the form of concrete, metal and plastic were observed in some of the test pits into stockpiles (TP17, SS1 to SS3) as shown on Drawing 3a, Appendix A.

The results of the soil testing indicated concentrations of TRH, BTEX, phenols, OCP, OPP and PCB PQL and the respective SAC. Metals were detected in all soil samples and PAH were detected in some soil samples but were all at low concentrations and within the SAC.

Friable asbestos was detected by laboratory analysis in sample SS2, which was obtained from one of the small southern stockpiles containing building rubble (including concrete). The friable asbestos concentration was 0.0033% w/w, above the commercial / industrial land use screening criteria of 0.001% w/w. This suggested an increased risk of encountering asbestos in stockpiles containing building wastes (e.g., concrete) and adjacent areas.

Although no asbestos was detected by laboratory analysis in any other samples, it was noted that other anthropogenic materials were reported in several of the stockpiles including concrete and rebar and these can be indicators of potential asbestos containing materials in the stockpiles.

The preliminary *in situ* waste classification for the fill material at the site was general solid waste (non-putrescible) and natural samples recorded results consistent with background ranges and below the adopted screening criteria for VENM. However, as asbestos was detected by laboratory analysis in sample SS2, the material in the corresponding stockpile (and other stockpiles comprising similar material) was preliminarily classified as general solid waste (non-putrescible), special waste (asbestos).

The assessment generally concluded that the site could be made suitable for the proposed industrial development from a contamination perspective. Notwithstanding, further assessment and targeted sampling of all stockpiles and adjacent areas where filling may have occurred was recommended to be undertaken to assess suitability of these materials to be retained on-site from a contamination perspective, most notably with respect to asbestos.

6.4 DP (2022b)

DP completed a SCI for the properties identified as 1030-1048 and 1032-1064 Mamre Road, Kemps Creek. Similar to DP (2021) and DP (2022a) it was understood that the report may be used to support a development application for a proposed industrial warehouse building development. The objective of the investigation was to investigate data gaps at the site, as identified in DP's previous investigations (outlined in the preceding sub-sections) and hence assess the suitability of the site for the proposed development and whether further investigation and / or management is required.

The combined investigation area was 4.3 ha and Table A of NSW EPA *Contaminated Sites, Sampling Design Guidelines* (NSW EPA, 1995)² recommends a minimum of 51 sampling points for this area and for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern. A combined systematic and judgemental sampling strategy was implemented which comprised a total of 82 test locations. Locations were positioned across accessible areas of the site and within the investigation areas, targeting the areas of environmental concern and supplementing the previous 55 test locations across the site from previous investigations. Test pit locations from this investigation are shown on Drawings 3a, 3b and 3c, Appendix A.

The lithology encountered during the investigation was generally consistent with observation during previous investigations (refer to previous sub-subsections). The stockpiles that were present at the western end of the site generally comprised clay fill with varying proportions of sand and gravel. Building rubble in the form of brick, concrete, rebar, metal, wire, glass, rubber, fabric, styrofoam, vinyl, terracotta, tile and plastic along with ash, clinker and charcoal and fibrous cement material (later confirmed to be ACM by laboratory analysis) were observed in some of the test pits excavated into the stockpiles as shown on Drawing 3a, Appendix A.

The results of the soil contamination testing for samples collected within *in situ* soils indicated concentrations for BTEX, phenol, OCP, OPP and PCB in all samples were below PQL and the respective SAC. Metals were detected in all soil samples and PAHs were detected in some soil samples but were all at low concentrations and within the SAC. TRH were detected above the PQL in some samples, however, with the exception of the surface sample from TP160 (TP160/0.1-0.2 m) all results below the SAC.

² Following completion of the field work for DP (2022b), NSW EPA (1995) was superseded by the *Sampling Design Guidelines for Contaminated Land* (NSW EPA, 2022) which were gazetted in August 2022. Notwithstanding, the approach to the soil sampling rational at the time of the field was considered suitable and considered to be generally consistent with the updated guidance.

A fibrous cement material sample identified as 'ACM8' was observed in the surface / near surface soils at test location TP160 which was confirmed to contain asbestos. No other asbestos was detected by laboratory analysis in any test locations within subsoils.

The results of the soil contamination testing for samples collected within stockpiles indicated concentrations for TRH, BTEX, phenol, OCP, OPP and PCB in all samples were below PQL and SAC. PAHs were detected in some soil samples but were all at low concentrations and within SAC. Metals were detected in all soil samples and the majority of these samples were below the SAC with the exception of samples at test locations TP127 (SP10) and TP129 (SP8).

Friable asbestos was detected by laboratory analysis in samples from test locations SS2 (DP, 2022a) in SP9, TP125 in SP12 and TP138 in SP6. Fibrous cement material fragment samples collected from test locations TP125 in SP12, TP126 in SP11, TP128 in SP10, TP131 in SP4 and TP132 in SP3 were confirmed to comprise asbestos in the form of ACM.

The results indicated that *in situ* material surrounding TP160 and stockpiled materials at SP3, SP4, SP6, SP9, SP10, SP11 and SP12 are considered to have a preliminary waste classification of general solid waste (non-putrescible), special waste (asbestos). Remaining fill and stockpiles were preliminarily classified as general solid waste (non-putrescible). Natural samples recorded results consistent with background ranges and below the adopted screening criteria for VENM.

The site history review and laboratory results from this and previous investigations indicated the risk of widespread gross chemical contamination is considered to be low with respect to the proposed industrial land use.

The investigation generally concluded that the site could be made suitable the proposed industrial development from a contamination perspective subject to implementation of the recommendations which included (in summary):

- Off-site disposal of stockpiles SP6, SP9 and SP12 where friable asbestos has been recorded;
- Further assessment of stockpiles SP3, SP4, SP10 and SP11 where non-friable asbestos has been identified to assess the suitability of this material to be retained on-site without management requirements;
- Placement of the remaining stockpiles site at depth (i.e., below 2 m of the final surface levels for the proposed development), above the groundwater table and preferable not within landscaped areas or areas likely to be subject to disturbance in the future (noting previous point for SP3, SP4, SP10 and SP11 also applies);
- Delineation of the asbestos and hydrocarbon contaminated soils around TP160 and subsequent remediation via off-site disposal of impacted soil to landfill;
- Development of a RAP (this report) that outlines the remediation and validation requirements for the relevant stockpiles and around TP160; and
- Development of an unexpected finds and asbestos finds protocol to be implemented during site works.

7. Conceptual Site Model

The data collected during previous investigations generally confirmed that for certain potential contaminant sources outlined in the CSM in DP (2022a), potentially complete pathways to the identified receptors exist, whereas for others, they do not. No other sources of contamination have been identified as a result of the testing results to date. The source (and associated contaminants of potential concern (CoPC)), pathway and receptor linkages are summarised in Table 1.

Potential Sources

Based on the current investigation, the following potential sources of CoPC have been identified.

- S1: Asbestos impacted fill comprising stockpile (SP) SP3 (Remediation Area 1).
 - o CoPC: asbestos (as ACM).
- S2: Asbestos impacted fill comprising SP4 (Remediation Area 2).
 - o CoPC: asbestos (as ACM).
- S3: Asbestos impacted fill comprising SP6 (Remediation Area 3).
 - o CoPC: asbestos (as asbestos fines and/or fibrous asbestos (AF/FA)).
- S4: Zinc impacted fill in SP8 (Remediation Area 4).
 - o CoPC: zinc.
- S5: Asbestos impacted fill comprising SP9 (Remediation Area 5).
 - o CoPC: asbestos (as AF/FA).
- S6: Copper and asbestos impacted fill comprising SP10 (Remediation Area 6).
 - o CoPC: copper and asbestos (as ACM).
- S7: Asbestos impacted fill comprising SP11 (Remediation Area 7).
 - o CoPC: asbestos (as ACM).
- S8: Asbestos impacted fill comprising SP12 (Remediation Area 8).
 - o CoPC: asbestos (as AF/FA).
- S9: Hotspot of TRH and asbestos impacted fill in the vicinity of TP160 (Remediation Area 9).
 - o CoPC: TRH and asbestos (as ACM).

Potential Receptors

The following potential human receptors have been identified:

- R1: Future users [industrial];
- R2: Construction and maintenance workers; and
- R3: Adjacent site users [residential and commercial / industrial].

The following potential environmental receptors have been identified:

- R4: Surface water [Kemps Creek (freshwater)]; and
- R5: Terrestrial ecology.

Potential Pathways

The following potential pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust;
- P3: Surface water run-off; and
- P4: Inhalation, ingestion and absorption.

A summary of the potentially complete exposure pathways for the proposed land use is shown in the table below.

Table 1: Summary of Potentially Complete Exposure Pathways (Proposed Land Use)

Source and CoPC	Transport Pathway	Receptor
Remediation Area 1: Asbestos impacted fill in SP3. Remediation Area 2: Asbestos impacted fill in SP4. Remediation Area 3: Asbestos impacted fill in SP6. Remediation Area 5: Asbestos impacted fill in SP9. Remediation Area 7: Asbestos impacted fill in SP11. Remediation Area 8: Asbestos impacted fill in SP12.	P1: Ingestion and dermal contact. P2: Inhalation of dust.	R1: Future users [industrial]; R2: Construction and maintenance workers; and R3: Adjacent site users [residential and commercial / industrial].
Remediation Area 4: Zinc impacted fill in SP8 Remediation Area 6: Copper and asbestos impacted fill in SP10. Remediation Area 9: TRH and asbestos impacted fill in the vicinity of TP160.	P1: Ingestion and dermal contact. P2: Inhalation of dust.	R1: Future users [industrial]; R2: Construction and maintenance workers; and R3: Adjacent site users [residential and commercial / industrial].
	P3: Surface water run-off.	R4: Surface water [Kemps Creek (freshwater)];
	P4: Inhalation, ingestion and absorption.	R5: Terrestrial ecosystems.

8. Pre-Remediation Requirements (Recommended)

Several stockpiles at the site were observed to comprise topsoil material (SP1 and SP2) as per DP (2022b), and uncontrolled fill with varying quantities of building rubble (SP5, SP7, SP13, SP15, SP16 and SP17). These stockpiles were subject to sampling in DP (2022b). Samples collected from these stockpiles have not exceeded the SAC set out in DP (2022b) and accordingly the risk for contamination is considered low. However, noting the presence of varying quantities of building rubble (which is an indicator for potential asbestos), it is recommended that these stockpiles (i.e., SP5, SP7, SP13, SP15, SP16 and SP17) are consolidated in one area of the site in preparation for burial at depth as a form of assisting with general management of the material during and post construction. The final location of the material is to be below 2 m of the final surface levels for the proposed development, above the groundwater table and preferable not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services). Refer to Section 11.2 below for more information.

9. Remediation Extent

The extent of remediation comprises:

- Remediation Area 1: All asbestos impacted fill comprising SP3;
- Remediation Area 2: All asbestos impacted fill comprising SP4;
- Remediation Area 3: All asbestos impacted fill comprising SP6;
- Remediation Area 4: All zinc impacted fill comprising SP8;
- Remediation Area 5: All asbestos impacted fill comprising SP9;
- Remediation Area 6: All copper and asbestos impacted fill comprising SP10;
- Remediation Area 7: All asbestos impacted fill comprising SP11;
- Remediation Area 8: All asbestos impacted fill comprising SP12; and
- Remediation Area 9: TRH and asbestos impacted fill in the vicinity of TP160 (anticipated to be in the near surface soils as indicated by the results from sample TP160/0.1-0.2 m).

The approximate extent of Remediation Area 1 to 8 is shown on Drawing 5, Appendix A and the approximate extent of Remediation Area 9 is shown on Drawing 6, Appendix A. The actual extent (i.e., the final remediation extent) will be established on completion of the excavation of these areas during remediation.

10. Remediation Options Assessment

The objective of the remediation options assessment and evaluation is to establish a preferred remediation strategy. The process involves canvassing various remedial options which may be viable and then ranking each option based on a number of evaluation criteria. The remediation options assessment was undertaken with reference to CRC CARE *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment* (CRC CARE, 2019b).

The remediation options assessment is included in Appendix E.

11. Preferred Remediation Strategy

11.1 Rationale

The rationale for the selection of the preferred remediation strategy is outlined in Appendix E. The preferred remediation strategy is as follows:

- Remediation Areas 1, 2, 6 and 7: Further assessment of non-friable asbestos at stockpiles SP3, SP4, SP10 and SP11 to determine if concentrations of asbestos containing material in the stockpiles are within the RAC and deemed to be suitable to be retained on-site;
- Remediation Areas 3, 5 and 8: Excavation and off-site disposal of friable asbestos stockpiles SP6, SP9 and SP12 as general solid waste - special waste (asbestos) to a suitably licenced waste facility;
- Remediation Area 4: Consolidation of all assessed material deemed suitable to be retained on site (including Remediation Area 4 (SP8)) and placement of material at a depth of at least 2 m below final design level and above the groundwater table. Preferably this material is also be located not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services) where feasible; and
- Remediation Area 9: Delineation of impacted fill surrounding TP160, excavation and off-site disposal to a suitably licenced waste facility.

11.2 Sequence of Pre-Remediation Requirements

The general sequence of pre-remediation requirements which need to be satisfied before remediation can commence is as follow:

- Task PR1: Demolition of existing structures across the site:
 - o Hazardous building materials (HBM) survey undertaken by suitably qualified and experienced Occupational Hygienist;
 - o Under the direction of suitably qualified and experienced Occupational Hygienist, removal of hazardous building materials (e.g., asbestos) from structures prior to demolition is to be undertaken. The Occupational Hygienist is to inspect the structure to confirm suitability of the HBM removal prior demolition and provide written documentation (including photographs) of this inspection to ESR and the Environmental Consultant. Reference for these works is to be made to the intrusive / destructive pre-demolition HBM Survey conducted for the subject structure being demolished;
 - o Demolition of existing structures. Works are to be undertaken by an appropriately qualified and licenced contractor, with building materials to be disposed of to a receiving site that is suitably licenced to legally receive the material;
 - o Following the demolition of structures, visual inspection and clearance (including clearance certificate) of the ground surface by the Occupational Hygienist is to be undertaken to confirm no HBM remain on the surface of the demolished structure footprints within the demolition work area (including and stockpiling areas haulage route(s)). The written documentation is to

- include photographs and drawing showing area cleared and be provided to ESR and the Environmental Consultant; and
- o On completion of the demolition works (and prior to remedial works commencing) the building footprints, and demolition works area more generally, are to be inspected by the Environmental Consultant to confirm the absence of ACM at the surface.
- Task PR2: Consolidation of stockpiles SP1 and SP2 (recommended):
 - o Consolidation of SP1 and SP2 (if appropriate, to be informed by final work methodology / construction approach);
 - o Tracking of SP1 and SP2 and noting the final location of the material;
 - o Periodic inspections during excavation of the stockpiles by the Environmental Consultant for signs of environmental concern (and undertake validation testing if deemed required); and
 - o On completion of stockpile excavation inspection of the stockpile footprint by the Environmental Consultant for signs of environmental concern (and undertake validation testing if deemed required).
- Note: Excavation and movement of stockpile to cease and the Environmental Consultant to be contacted should signs of building rubble or signs of other environmental concerns be encountered.
- Task PR3: Consolidation of stockpiles SP5, SP7, SP13, SP15, SP16 and SP17 (recommended):
 - o Excavation of stockpile footprints to at least 100 mm into sub soils;
 - o Consolidation of SP5, SP7, SP13, SP15, SP16 and SP17;
 - o Tracking of consolidated stockpiles and noting the final location of the material. Placement of material at depth (i.e., below 2 m of the final surface levels for the proposed development), above the groundwater table and preferable not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services);
 - o Survey of the area where material placed (refer to Section 11.3.3);
 - o Periodic inspections during excavation of the stockpiles by the Environmental Consultant for signs of environmental concern (and undertake validation testing if deemed required); and
 - o On completion of stockpile excavation inspection of the stockpile footprint by the Environmental Consultant for signs of environmental concern (and undertake validation testing if deemed required).

11.3 Sequence of Remediation

The general sequence of remediation shall be determined by the Principal Contractor and Remediation Contractor and should consider the following recommended sequence:

- Task 1: Assessment of Remediation Areas 1, 2, 6 and 7 where asbestos (non-friable) has been encountered in stockpiles and retention of stockpiled material on-site that is below the RAC;
- Task 2: Assessment, excavation and off-site disposal of Remediation Areas 3, 5 and 8 where asbestos (friable) has been encountered in stockpiles;

- Task 4: Placement of material suitable to be retained on site (including Remediation Area 4 (SP8) with zinc impacted fill and if appropriate Remediation Area 6 (SP10) with copper impacted fill) at depth (i.e., below 2 m of the final surface levels for the proposed development), above the groundwater table and preferable not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services); and
- Task 4: Delineation of Remediation Area 9, excavation and off-site disposal of TRH and asbestos impacted fill to a suitably licenced waste facility.

11.3.1 Task 1: Remediation Areas 1, 2, 6 and 7 – Assessment of SP3, SP4, SP10 and SP11

- Sampling, testing and validation of SP3, SP4, SP10 and SP11 at a rate of 1 sample per 25 m³ for bonded (sieve test) and friable (AF/FA) asbestos and a minimum of three samples per stockpile. It is noted that AF/FA analysis results previously reported as part of early investigations for these areas may also be taken into account;
- Excavation and retention of material that is confirmed to be below the HSL for asbestos as per the RAC. This material is to be stockpiled with the material from Task PR3 (see Section 11.2) for future placement of the material at depth (i.e., below 2 m of the final surface levels for the proposed development), above the groundwater table and preferable not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services). Note: further requirements for this stockpiled material outlined below in Task 3, Section 11.3.3;
- Excavation of the stockpiled fill deemed unsuitable for retention on site (without ongoing long-term management) and disposal of material to a suitably licenced waste facility. Confirmation of the waste classification of this material will be required prior to removal from site as per Section 14;
- Excavation of stockpile footprints to at least 100 mm into the sub soils;
- Validation of stockpile footprints as per Section 13.4; and
- Incorporating the validation results in the validation report for the site.

11.3.2 Task 2: Remediation Areas 3, 5 and 8 – Offsite Disposal of SP6, SP9 and SP12

- Confirmation of the waste classification of SP6, SP9 and SP12 prior to removal as per Section 14;
- Excavation of soil / fill from within the excavation zone to a depth of at least 100 mm into sub soils beneath stockpile footprints and disposal of materials at a suitably licenced waste facility;
- Validation of stockpile footprints as per Section 13.4; and
- Incorporating the validation results in the validation report for the site.

11.3.3 Task 3: Placement of Validated and Suitable Stockpiled Material at Depth and Outside of Landscaped Areas or Offsite Disposal

- Consolidation of all assessed material deemed suitable to be retained on site (including Remediation Area 4 (SP8) and those part of the Task PR3 requirements as discussed in Section 11.2);

- Placement of material at a depth of at least 2 m below final design level and above the groundwater table. Preferably this material should also be located not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services);
- Whilst not required, it is recommended the top of the material is covered in a marker layer (e.g., orange geofabric);
- Survey of the area(s) where the material has been placed. This is to include a survey of the material's lateral extent and height in Australian Height Datum (AHD). Surveys to comprise in the order of one survey point per 40 m² and every 5-10 lateral meters around the perimeter of the area(s);
- Survey of the final surface level at the same survey point locations (as per the preceding point), and overlayed on the original drawing to confirm a minimum 2 m depth to the top of the placed material has been achieved. This survey is to be overlaid on a recent aerial photograph and provided to ESR and the Environmental Consultant;
- Validation of stockpile footprints as per Section 13.4; and
- Incorporating the location of the buried material in the validation report for the site.

Note: Other considerations (e.g., geotechnical) may determine the material is not suitable and requiring removal from site. Under these circumstances the material's waste classification is to be determined and the material disposed of to a suitably licenced waste facility.

11.3.4 Task 4: Remediation Area 9 – Delineation and Offsite Disposal

- Excavation of soils from around TP160 in an assumed area at this stage of approximately 15 m by 20 m with an initial assumed depth of 0.2 m. Excavation to be undertaken under the direction of the Environmental Consultant with excavated material stockpiled awaiting assessment and off-site disposal. Refer to Drawing 6, Appendix A for approximate initial indicative excavation footprint;
- Sampling, testing and validation of TRH and asbestos (bonded ACM and AF/FA) in the areas from which the contaminated materials is excavated;
- Sampling, testing and validation of other soil contaminants from the surplus contaminated materials excavated (if required);
- If validation testing fails to meet the RAC, further step out testing vertical and / or laterally is to be conducted in areas of the initial which have failed in order to chase out remaining *in situ* contamination as per Section 13.4;
- Confirmation of the waste classification of all soils from the delineation works prior to removal from site. This may be in the form of *ex situ* classification (i.e., classification of a stockpile of soil stored on the site following excavation);
- Off-site disposal of unsuitable fill to a suitability licensed waste facility;
- Validation of stockpile footprints as per Section 13.4; and
- Incorporating the validation results in the Validation Report for the site.

12. Remediation Acceptance Criteria

The following table provides a summary of the qualitative and concentration-based RAC.

Table 2: Remediation Acceptance Criteria

Item	Remediation Acceptance Criteria
-Remediation Area 1 (SP3), 2 (SP4) and 7 (SP11). -Assessment of asbestos (primarily bonded) concentrations in stockpile. -Asbestos.	The RAC is for the stockpiled material to have an ACM concentration of <0.05% w/w and an AF/FA concentration of <0.001% w/w. Additionally, the RAC for the excavated based of the stockpile footprints to have an ACM concentration of <0.05% w/w, an AF/FA concentration of <0.001% w/w and no visible asbestos on the surface.
-Remediation Area 3 (SP6), 5 (SP9) and 8 (SP12). -Excavation and off-site disposal. -Asbestos.	The RAC is for the excavated base of the stockpile footprints to have an ACM concentration of <0.05% w/w, an AF/FA concentration of <0.001% w/w and no visible asbestos on the surface.
-Remediation Area 4 (SP8). -Placement of material at depth. -Zinc.	The RAC is for the excavated base of the stockpile footprint to have a zinc concentration of ≤900 mg/kg.
-Remediation Area 6 (SP10). -Assessment of asbestos (primarily bonded) concentration in stockpile. -Copper and asbestos.	The RAC is for the excavated base of the stockpile footprint to have a copper concentration of copper of ≤320 mg/kg, an ACM concentration of <0.05% w/w, an AF/FA concentration of <0.001% w/w and no visible asbestos on the surface.
-All stockpiled material (excluding SP1 and SP2).	Material confirmed by survey to be at depth (i.e., below 2 m of the final surface levels for the proposed development) and above the groundwater table. Note: Also, preferable not to be located within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services).
-Remediation Area 9 (TP160). -Excavation and off-site disposal. - TRH and asbestos.	The RAC is for the base and sides of the excavation to have a TRH >C ₁₀ -C ₁₆ concentration of ≤170 mg/kg, ACM concentration of <0.05% w/w, an AF/FA concentration of <0.001% w/w and no visible asbestos on the surface.

In the absence of derivation of Tier 2 site specific target levels, the RAC for contaminants in soil are the same as the Tier 1 SAC adopted for DP (2022b), protective of human health and ecology. The RAC for common contaminants is summarised in Table F1, Appendix F. Reference should be made to DP (2022b) for further information on how the RAC (based on the SAC) was generated. If other CoPC not listed in Table F1 are identified during works, the Environmental Consultant is to generate screening criteria for the subject contaminant with reference to relevant guidance.

The RAC also applies to works under the contingency plan, unexpected find protocol and asbestos finds protocol (Appendix I) and for assessing suitability of imported materials from a contamination perspective.

Moreover, Appendix F (and as summarised in Table F1) also provides a screening criteria for assessing VENM.

13. Validation Plan

13.1 Data Quality Objectives

The data quality objectives (DQO) for the validation plan are included in Appendix G.

13.2 Validation Assessment Requirements

The following site validation work will be required:

- Field assessment by the Environmental Consultant comprising:
 - o Visual inspection, including taking photographs for record purposes;
 - o Collecting validation samples from excavations resulting from the removal of contaminated soils;
 - o Collecting validation / characterisation samples for materials to be retained on-site; and
 - o Assessment of the suitability of imported materials.
- Surveying by the Surveyor comprising:
 - o Survey of the extent and levels of the top of the area where stockpiled material has been placed at depth;
 - o Survey of the final surface level post development in the footprint of where stockpiled material has been placed at depth;
 - o Survey of the locations and extent the existing stockpiles and any stockpiles generated through remedial works (where required); and
 - o Generation of survey drawings (including overlaying on recent aerial photographs).
- Laboratory analysis of validation samples at a NATA accredited laboratory for:
 - o The CoPC relevant to the remediation area; and
 - o Quality control (QC) samples in accordance with Section 16.
- Comparison by the Environmental Consultant of the laboratory results with the SAC and / or RAC as appropriate (refer to Section 12); and
- Preparation by the Environmental Consultant of a validation report detailing the methods and results of the remediation works and validation assessment.

13.3 Visual Inspections

All areas to be assessed and validated are to be subject to a visual inspection by the Environmental Consultant. Any observed ACM or areas of staining (if appropriate for the remediation) must be removed prior to validation sampling. A photographic record of each inspection is to be kept on file for future use of selected photographs in the site validation report (where applicable).

13.4 Validation Sampling

The sampling frequency will depend on the volume or area to be assessed and the previous results. The following approximate sampling frequencies are to be adopted but may be modified by the Environmental Consultant to take into account previous results, where applicable.

Small to medium excavations (base <500 m²):

- Base of excavation: one sample per 25 m² to 50 m² or part thereof, with a minimum of three samples collected; and
- Sides of excavation: one sample per 10 m to 20 m length or part thereof with a minimum of one sample per wall. Additional samples are to be collected at depths of concern where there is more than one depth of concern, with a minimum of one sample per 1.5 m depth in fill.

Large excavations (base ≥500 m²):

- Base of excavation: sampling on a grid at a density with reference to NSW EPA (2022) or a minimum of 10 samples. In sub-areas with any specific signs of concern, a higher sampling density may be required; and
- Sides of excavation: one sample per 20 m length or part thereof with a minimum of one sample per wall. Additional samples will be collected at depths of concern where there is more than one depth of concern, with a minimum of one sample per 1.5 m depth in filling.

It should be noted that where excavations have been generated from scrapping of the surface (e.g., for stockpile footprints) causing shallow excavations of no greater than 0.2 m depth, validation of the sides of the excavation may not be required. This is to be determined by the Environmental Consultant following inspection of the subject area / excavation.

Where contaminated soils are stored or treated on bare soils, the footprint of the stockpile will require validation following removal of the contaminated soils.

Validation samples are to be analysed by a NATA accredited laboratory for the CoPC relevant to the remediation area.

Validation sample test results are to be compared to the RAC, as per the DQO (Appendix G). Where the RAC are considered to have not been met, the remediation excavation(s) are to be expanded to 'chase-out' impacted material, as instructed by the Environmental Consultant, with the validation sampling then continuing into the extended excavation. This process is to continue until the impacted material has been fully chased out.

14. Waste Disposal

Any waste disposed off-site must be initially classified by the Environmental Consultant in accordance with:

- NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste* (NSW EPA, 2014a);
- NSW EPA *Waste Classification Guidelines, Part 2: Immobilisation of Waste* (NSW EPA, 2014b);
- NSW EPA *Waste Classification Guidelines, Part 4: Acid Sulfate Soils* (NSW EPA, 2014c); and
- NSW EPA *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste* (NSW EPA, 2016) [addendum for per- and poly-fluoroalkyl substances (PFAS)].

Disposal of waste must be to an appropriately licensed waste facility, as per *Protection of the Environment Operations Act 1997* NSW (POEO Act) and the *Protection of the Environment (Waste) Regulation 2014* NSW.

Samples are to be collected from stockpiles / *in situ* fill at various depths to characterise the full depth of the material. The frequency is to be determined by the Environmental Consultant based on the risk of contamination and heterogeneity of the material.

The suggested sampling frequency for the initial assessment of stockpiles comprising similar materials shall be:

- One sample per 25 m³ for stockpiles up to 200 m³, with a minimum of three samples per stockpile; and
- One sample per 20 m³ to 250 m³ for stockpiles greater than 200 m³, by applying statistical analysis with reference to NSW EPA (2022).

It may be possible to classify excavated soil / fill for reuse on another site under a relevant NSW EPA resource recovery order (RRO) so that it can be used on other sites under the requirements of the corresponding NSW EPA resource recovery exemption (RRE). For this option, the frequency of sampling and sampling parameters should be in accordance with the relevant RRO and the contaminants to be analysed determined by the Environmental Consultant. The Environmental Consultant is to provide a report confirming the suitability of the spoil for reuse under a RRO, or otherwise.

All waste must be tracked by the Remediation Contractor from 'cradle to grave'. Copies of all consignment notes / disposal dockets (or similar) and Environment Protection Licences for receipt and disposal of the materials are to be maintained by the Remediation Contractor as part of the site log and provided to the Environmental Consultant for inclusion in the validation report.

15. Imported Material

Any imported material (including soil, aggregate etc) for the remediation works must have contaminant concentrations that meet the relevant criteria outlined in Table F1, Appendix F and have no aesthetic issues of concern. Imported materials are only to be accepted for use at the site if:

- It can legally be accepted onto the site (e.g., classified as VENM, accompanied by a report / certificate prepared by a qualified environmental consultant);

- Visual inspection of the imported soil confirms that the soil has no signs of concern and is consistent with those described in the supporting classification documentation; and
- The materials are validated (by inspection/sampling) by the Environmental Consultant as being suitable for use at the site.

The classification report/certificate for all material proposed for import must be reviewed and approved in writing by the Environmental Consultant prior to import. Materials to be imported may need to meet geotechnical requirements which are to be assessed by others, as required.

If permitted by the development consent and approved by the Principal's Representative, Principal Contractor, Remediation Contractor and Environmental Consultant, material classified under a NSW EPA RRO may also be accepted, provided the material can be used on site in accordance with the corresponding RRE.

Any soils (including topsoil and aggregate) imported are to be classified as VENM, be quarried natural material, or must be compliant with an appropriate RRO. All imported material classifications are to be supported by the relevant chemical and physical testing results and at a minimum include analysis for heavy metals, TRH, BTEX, PAH, PCB³ and asbestos. In this regard, materials imported under an RRO are, in addition to the preceding, also to be compliant with the relevant resource recovery testing requirements and criteria (RRC). Furthermore, results are to be compared against the RAC where applicable. Note, where there is a difference between the RAC and the RRC, the more conservative criteria is to be adopted.

VENM is to be sampled for each source site at a minimum rate of three samples for the first 1,000 m³ and then one sample per 1,000 m³ thereafter.

VENM (and excavated natural material (ENM)) reports should include information on the source site's location, history and the potential for contamination (e.g., review of aerial photographs, previous contamination reports and EPA online database), a list of CoPC, reasoning for the sampling and analysis approach undertaken, description and photographs of the material assessed (and associated drawing where required) and a determination of the soil's classification.

Table F1, Appendix F (and with reference to Section 12) also provides screening criteria for VENM that is to be adopted for imported VENM.

The material must be inspected during importation by the Remediation Contractor, and any materials not meeting the description given in the provided documentation or displaying signs of contamination are to be rejected. The Environmental Consultant is to conduct periodic inspection(s) during and / or following importation to check the same. Additional testing of the imported material may be required, as recommended by the Environmental Consultant, commensurate with the documentation and the material type / classification.

DP notes that generally materials imported under a RRO present a higher contamination risk, hence, extra caution should be used if proposing to use a recycled product.

³ Minimum PCB analysis requirement not applicable to VENM or quarried materials.

16. Quality Assurance and Quality Control

Field quality assurance and quality control (QA / QC) testing during validation sampling is to include the following:

- Replicate samples analysed at a rate of 10% of primary samples subject to analysis. This comprising:
 - o 5% sample intra-laboratory analysis for the primary CoPC that the primary sample has been analysed for; and
 - o 5% sample inter-laboratory analysis for the primary CoPC that the primary sample has been analysed for.
- Rinsate samples per phase of sampling where re-useable sampling equipment is used. Samples to be analysed for metals and TRH; and
- Trip spike and trip blank samples per phase of sampling and where volatile or semi-volatile contaminants are being analysed. Samples to be analysed for BTEX.

The laboratory is to undertake analysis in accordance with its NATA accreditation, including in-house QA/QC procedures. It is noted that AF/FA and 10 L bulk sample asbestos analysis as per NEPC (2013) are not NATA accredited tests and hence are exempt from this NATA requirement.

The QC analytical results are to be assessed using the following criteria:

- Sampling location rationale meet the sampling objective;
- Standard operating procedures are followed;
- Appropriate QA/QC samples are collected/prepared and analysed;
- Samples are stored under secure, temperature-controlled conditions;
- Chain of custody documentation is employed for the handling, transport and delivery of samples to the selected laboratory;
- Conformance with specified holding times;
- Accuracy of spiked samples within the laboratory's acceptable range (typically 70-130% for inorganic contaminants and greater for some organic contaminants);
- Field and laboratory replicate samples will have a precision average of +/- 30% relative percentage difference (RPD); and
- Rinsate samples showing that the sampling equipment (if used) is free of introduced contaminants, i.e., the analytes show that the rinsate sample is within the normal range for deionised water.

17. Management and Responsibilities

17.1 Site Management Plan

A general site management plan for the operational phase of site remediation is included in Appendix H. The management plan includes soil, noise, dust, work health safety, remediation schedule, hours of operation and incident response. The Remediation Contractor is to implement the general site management plan for the duration of remedial works by incorporating the plan into their over-arching construction environmental management plan.

17.2 Site Responsibilities

The site management plan (Appendix H) provides a summary of the general management and associated responsibilities. Contact details for key utilities are also to be included in the event of needing to respond to any incidents.

17.3 Contingency Plan, Unexpected Finds Protocol and Asbestos Finds Protocol

Plans for contingency situations (e.g., encountering asbestos in fill where not previously identified), along with an unexpected finds and asbestos finds protocol for dealing with unexpected / asbestos finds during remediation work / earthworks are included in Appendix I.

18. Validation Reporting

18.1 Documentation

The following documents will need to be collated and reviewed by the Environmental Consultant as part of the validation assessment (including those items that are prepared by the Environmental Consultant):

- Any licences and approvals required for the remediation works;
- Waste classification report(s);
- Transportation Record: comprising a record of all truck-loads of soil (including aggregate) entering the site, including truck identification (e.g., registration number), date, time, source site, load characteristics (e.g., type of material, i.e., quarried aggregate, etc.), approximate volume, use (e.g., general site raising, service trenches, etc.);
- Disposal dockets: for any soil disposed off-site. The Remediation Contractor will supply records of: transportation records, spoil source, spoil disposal location, receipt provided by the receiving waste facility / site. Note: A record of the building materials disposed off-site is also be kept and provided to the Principal, on request;
- Imported materials records: records for any soil imported onto the site, including source site, classification reports, inspection records, volume / weight of each load, of soil upon receipt at site and transportation records;
- Letters / memos as required to provide instruction or information to the relevant contractor;

- Records relating to any unexpected finds and contingency plans implemented;
- Laboratory certificates and chain-of-custody documentation;
- Inspections records from the Environmental Consultant (and Occupation Hygienist, where appropriate);
- Photographic records by all contractors and consultants of the works undertaken within their purview of responsibilities;
- Surveys pre- and post placement of stockpiles at depth and of the final surface level in the subject area. These are to be overlayed surveys on a recent aerial photograph;
- Airborne asbestos monitoring records (if undertaken by the Occupational Hygienist); and
- Interim / final visual and sampling clearances for any asbestos related works.

18.2 Reporting

A validation assessment report will be prepared by the Environmental Consultant in accordance with NSW EPA (2020).

The validation report shall describe the remediation approach adopted, methodology, results and conclusion of the assessment and make a statement regarding the suitability of the site for the proposed industrial warehouse development.

19. Conclusions

It is considered that the site can be rendered suitable from a contamination perspective for its industrial / commercial use subject to appropriate remediation, management and site validation in accordance with this RAP.

The successful completion of the remediation is to be validated and reported as outlined herein.

The Environmental Consultant is to be informed if there are any proposed changes to the remediation approach, and if so, this RAP must be updated in consultation with the relevant parties.

20. References

CRC CARE. (2019a). *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019b). *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

EPA Victoria. (2009). *Soil Sampling*. Publication IWRG702, June 2009: Environment Protection Authority Victoria, Melbourne, Australia.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW DUAP/EPA. (1998). *Managing Land Contamination, Planning Guidelines, SEPP 55 – Remediation of Land*. NSW Department of Urban Affairs and Planning / Environment Protection Authority.

NSW EPA. (1995). *Contaminated Sites, Sampling Design Guidelines*. NSW Environment Protection Authority.

NSW EPA. (2014a). *Waste Classification Guidelines, Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2014b). *Waste Classification Guidelines, Part 2: Immobilisation of Waste*. NSW Environment Protection Authority.

NSW EPA. (2014c). *Waste Classification Guidelines, Part 4: Acid Sulfate Soils*. NSW Environment Protection Authority.

NSW EPA. (2014d). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014*. NSW Environment Protection Authority.

NSW EPA. (2016). *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

21. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 1030-1064 Mamre Road, Kemps Creek in general accordance with DP's proposal 211619.00.P.001.Rev0 dated 18 May 2022. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of ESR Australia for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents. DP's interpretations and conclusions are based on the information provided by others being accurate. DP cannot be held liable for these interpretations and conclusions where the information provided by others is not accurate.

This RAP has been prepared based on the results of previous investigations at the site and the proposed development works. Should site conditions encountered during works differ from those currently understood and as outlined in this report, the proposed works be altered and/or the remedial approach amended without DP's knowledge and agreement, this RAP would no longer be valid for remediation of the site.

The results provided in the report from previous investigations are indicative of the sub-surface and stockpile conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface and stockpile conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during previous investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility. Building demolition materials, such as concrete, brick, tile, metal and plastic, were observed and detected in below-ground fill and above-ground stockpiles, and these are considered as indicative of the possible further presence of hazardous building materials (HBM), including asbestos. Moreover, asbestos has been detected by observation and laboratory analysis, either on the surface of the site, or in fill materials at the test locations sampled and analysed.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

Drawings

Drawing 1: Site Location and Proposed Development

Drawing 2: Stockpile Footprints

Drawing 3a: Previous Test Locations, and Stockpile Footprints
in North-Western Portion of Site

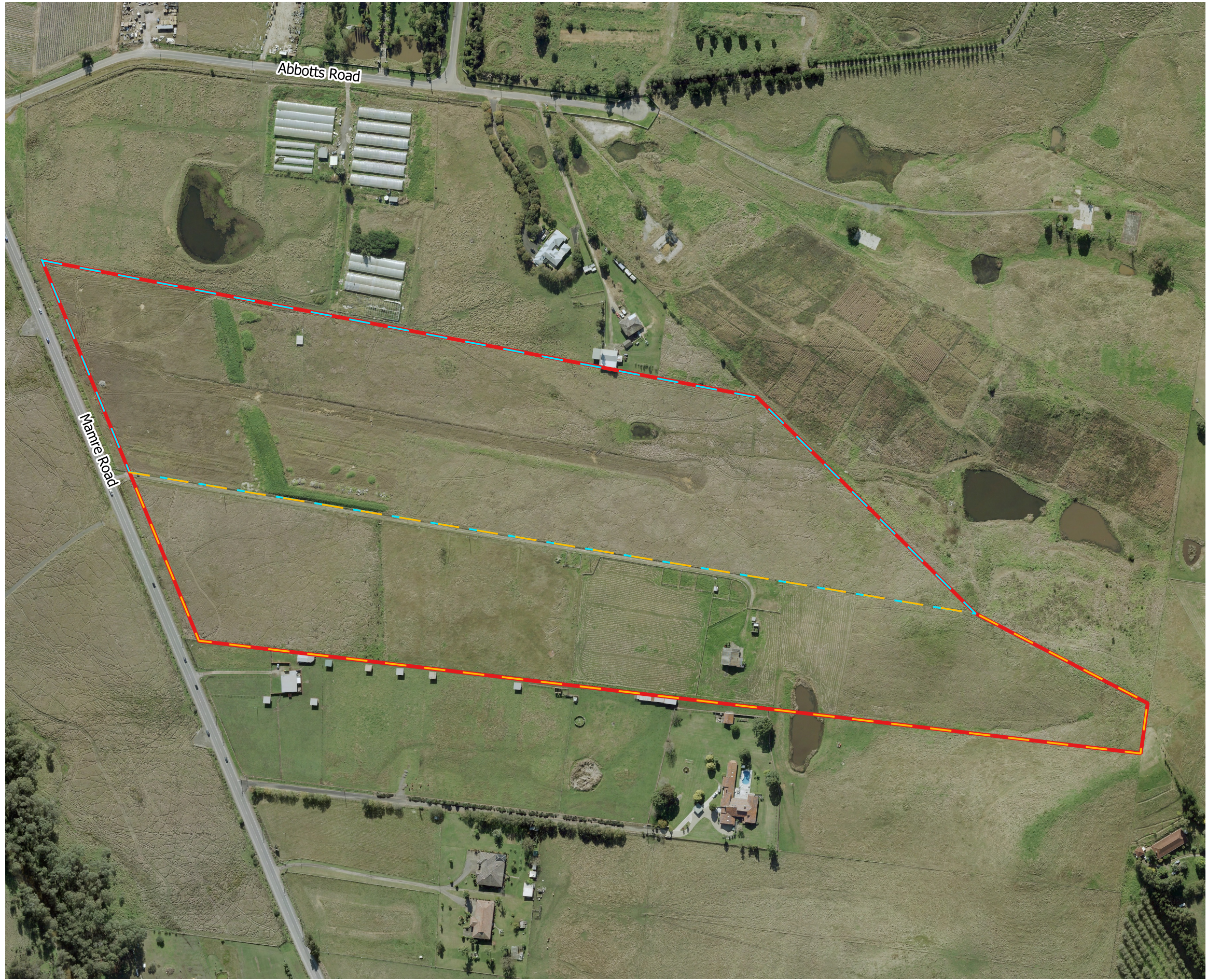
Drawing 3b: Previous Test Locations, and Stockpile Footprints
in South-Western Portion of Site

Drawing 3c: Previous Test Locations in Eastern Portion of Site

Drawing 4: Test Locations and Stockpiles Exceeding Site Assessment
Criteria

Drawing 5: Remediation Areas 1 to 8

Drawing 6: Remediation Area 9

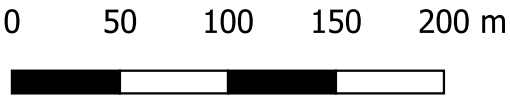


LOCALITY MAP

- Notes:
- 1. Basemap from metromap.com.au.
 - 2. Site and property boundaries inferred from NSW spatial services lot boundary.

Legend

- Site Boundary
- Property Boundaries
 - 1030-1048 Mamre Road
 - 1050-1064 Mamre Road





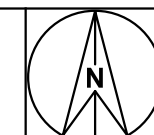
LOCALITY MAP

- Notes:
1. Basemap from metromap.com.au
 2. Site boundary inferred from NSW spatial services lot boundary.
 3. Stockpile footprints surveyed 01/08/22 by DP and are indicative only.

Legend

- Site Boundary
- Stockpile Footprint

0 20 40 60 80 100 m





Notes:
1. Basemap from metromap.com.au
2. Site boundary inferred from NSW spatial services lot boundary.
3. Stockpile footprints are approximate only.

Legend

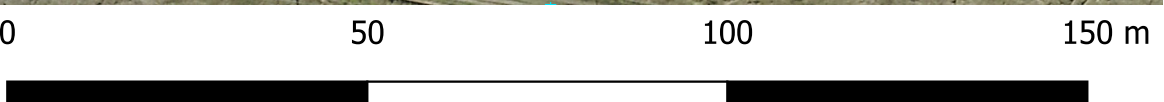
Site Boundary

Stockpiles

DP (2021)
Surface Sample

DP (2022a)
Test Pit
Surface Sample

DP (2022b)
Test Pit
Borehole

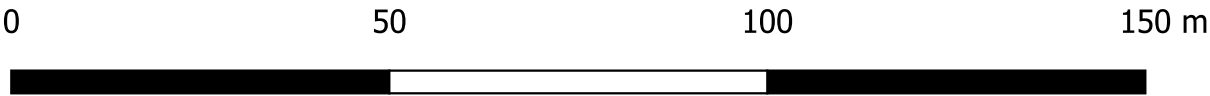




Notes:
1. Basemap from metromap.com.au
2. Site boundary inferred from NSW spatial services lot boundary.
3. Stockpile footprints are approximate only.

Legend

- | | | | |
|---------------|----------------|----------------|------------|
| Site Boundary | DP (2021) | DP (2022a) | DP (2022b) |
| Stockpiles | Surface Sample | Test Pit | Test Pit |
| | Borehole | Surface Sample | Borehole |
| | Test Pit | | |

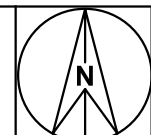


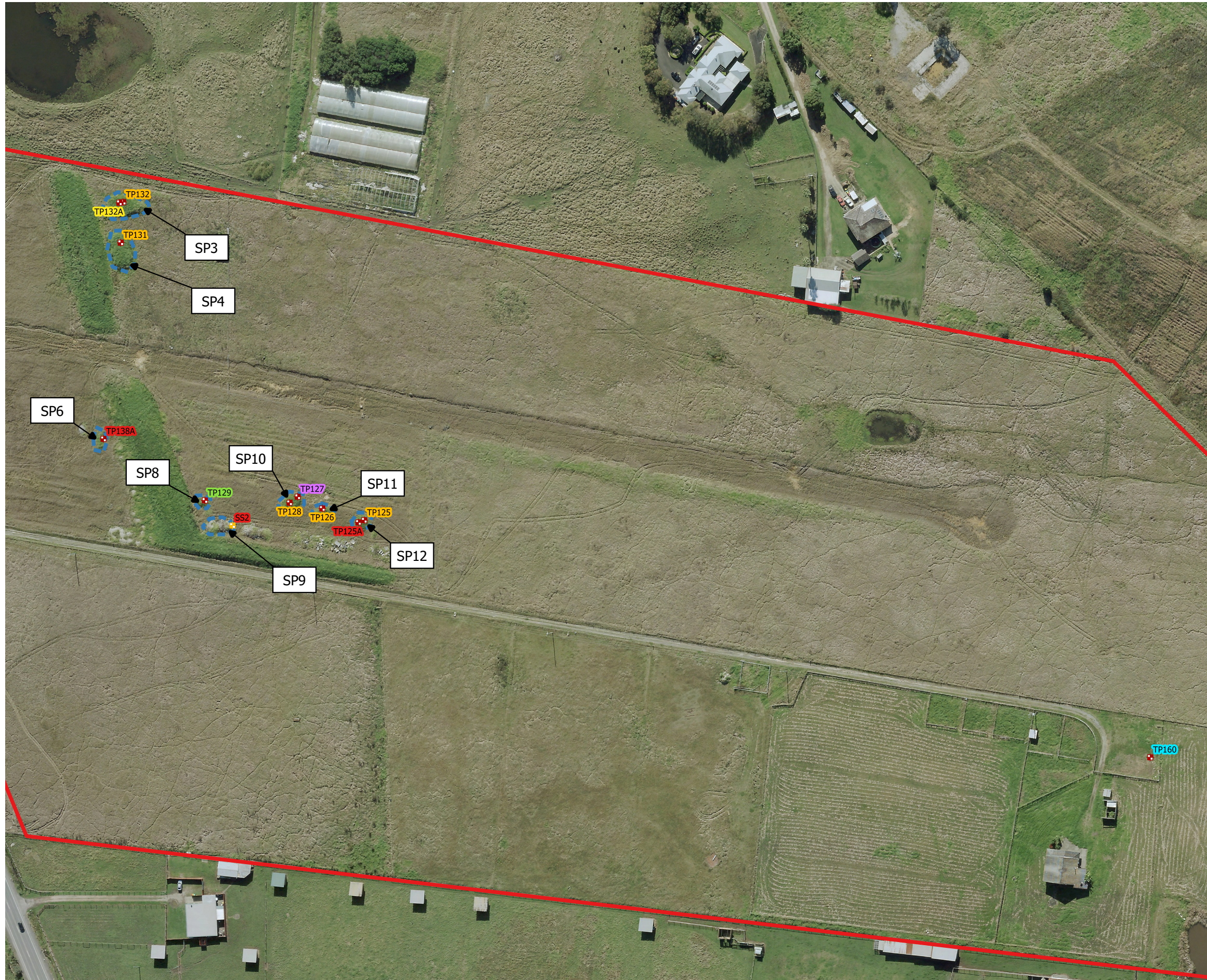


Notes:
1. Basemap from metromap.com.au
2. Site boundary inferred from NSW spatial services lot boundary.

Legend

- | | | | |
|---------------|----------------|------------|------------|
| Site Boundary | DP (2021) | DP (2022a) | DP (2022b) |
| Stockpiles | Surface Sample | Test Pit | Test Pit |
| | Borehole | | Borehole |
| | Test Pit | | |



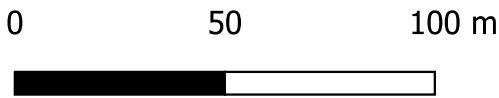


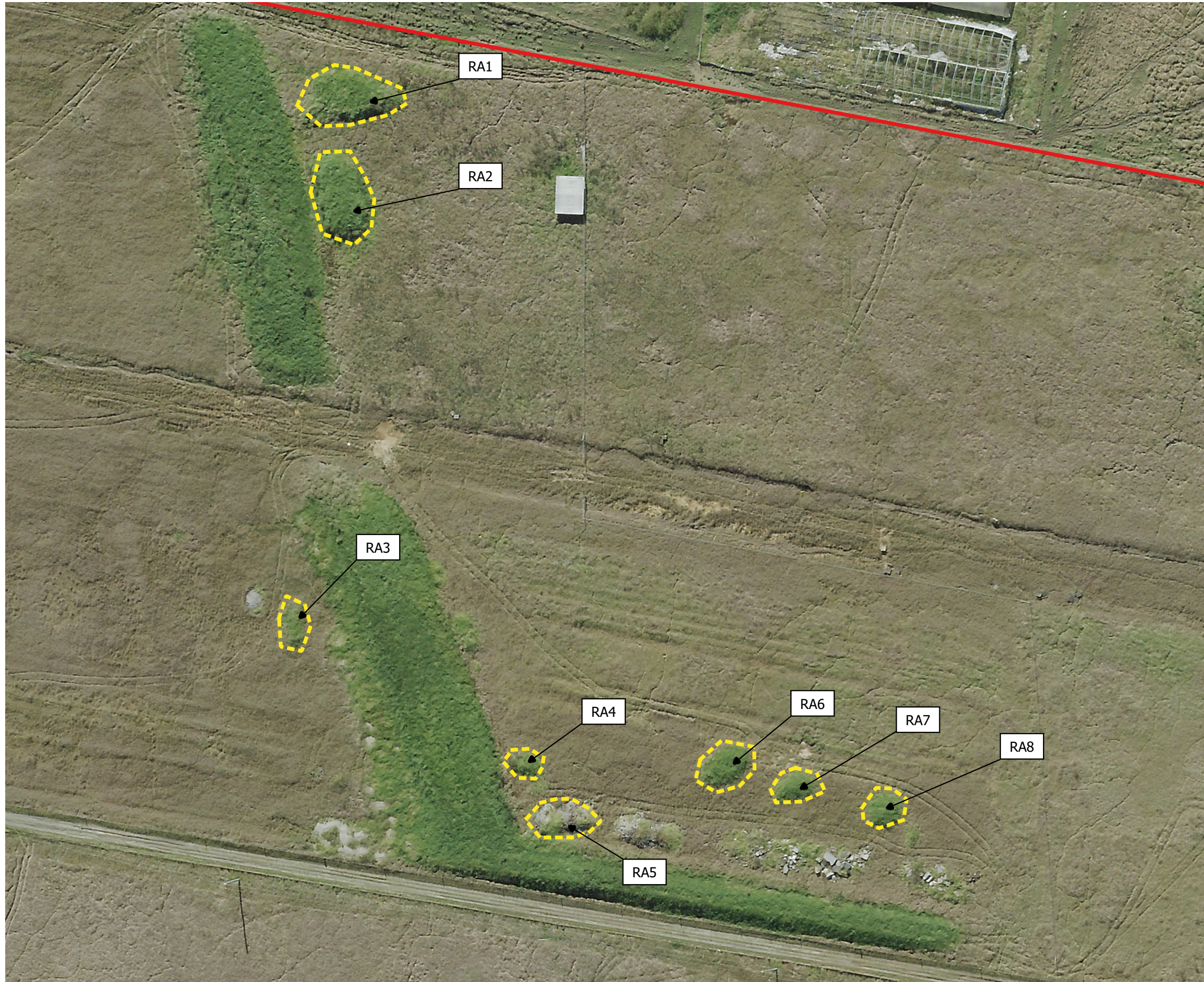
LOCALITY MAP

- Notes:
1. Basemap from metromap.com.au
 2. Site boundary inferred from NSW spatial services lot boundary.
 3. Stockpile footprints are approximate only.

Legend

- Site Boundary
- Stockpile
- Surface Sample (DP, 2022a)
- Test Pit (DP, 2022b)
- Metals EIL Exceedance
- Metals EIL and Asbestos (non-friable)
- TRH ML and EIL, and Asbestos (non-friable)
- Asbestos (non-friable)
- Asbestos (friable)
- ACM Observed





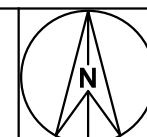
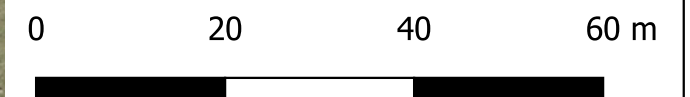
LOCALITY MAP

Notes:

1. Basemap from metromap.com.au
2. Site boundary inferred from NSW spatial services lot boundary.
3. Stockpile footprints are approximate only.

Legend

- Site Boundary
- Remediation Areas (RA) (Stockpile Footprints)





LOCALITY MAP

- Notes:
- 1. Basemap from metromap.com.au
 - 2. Remediation Area footprint is approximate only.

Legend

- Site Boundary
- Remediation Area 9
- Test Pit (DP, 2022b)



Appendix B

About this Report

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix C

Tabulated Summary Results Extracted from DP (2022b)

Table I1: Summary of Laboratory Results for Site Suitability

				Metals								TRH								BTEX				PAH									Asbestos								
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 (SGC) ¹	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F3 (>C16-C34) (SGC)	F4 (>C34-C40)	F4 (>C34-C40) (SGC)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	All OCP c d	OPP e	Total PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation		
			PQL	4	0.4	1	1	1	0.1	1	1	25	50	50	25	50	100	100	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001		
Sample ID ^a	Depth	Matrix	Sample Date	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	-	-	-	g/kg	g	g	%(w/w)
Previous Investigation (DP, 2021) - 1050-1064 Mamre Road																																									
TP2	0.1 - 0.2 m	Natural	7/09/2021	11	<0.4	22	14	25	<0.1	9	27	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NAD	NAD	NT	NT	NT				
TP4	0.1 - 0.2 m	Natural	7/09/2021	10	<0.4	19	12	21	<0.1	8	30	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NAD	NAD	NT	NT	NT				
TP6	0.1 - 0.2 m	Fill	7/09/2021	7	<0.4	13	16	15	<0.1	7	28	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NAD	NAD	NT	NT	NT				
TP6	0.5 - 0.6 m	Natural	7/09/2021	5	<0.4	10	18	9	<0.1	4	20	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT			
TP8	0.1 - 0.2 m	Natural	7/09/2021	6	<0.4	17	30	17	<0.1	19	52	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT			
TP8	0.5 - 0.6 m	Natural	7/09/2021	5	<0.4	19	26	16	<0.1	19	49	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NAD	NAD	NT	NT	NT				
TP9	0.5 - 0.6 m	Fill	7/09/2021	11	<0.4	18	22	16	<0.1	16	40	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NAD	NAD	NT	NT	NT				
TP10	0.1 - 0.2 m	Natural	7/09/2021	5	<0.4	17	33	14	<0.1	13	32	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	<0.001				
TP10	0.5 - 0.6 m	Natural	7/09/2021	8	<0.4	19	33	18	<0.1	20	53	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT			
TP12	0.1 - 0.2 m	Natural	7/09/2021	7	<0.4	13	15	15	<0.1	9	27	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	<0.001				
TP12	0.5 - 0.6 m	Natural	7/09/2021	6	<0.4	14	38	16	<0.1	17	51	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	4000 -	660 -	2500 -	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT			
BD2	0.5-0.6 m	Natural	7/09/2021	6	<0.4	13	34	15	<0.1	15	45	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
				3000 160 900	-	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	-	-	- 170	- 170	310 215 NL -	-	2500 -	2500 -	6600 -	6600	4 95 NL 135 NL 185 NL 95 NL 370	-	172	40 -	40															

Supplementary Contamination Investigation
Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek

Table I1: Summary of Laboratory Results for Site Suitability

				Metals								TRH								BTEX				PAH									Asbestos									
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 (SGC) ¹	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F3 (>C16-C34) (SGC)	F4 (>C34-C40)	F4 (>C34-C40) (SGC)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	All OCP c d	OPP e	Total PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation			
			PQL	4	0.4	1	1	1	0.1	1	1	25	50	50	25	50	100	100	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001			
Sample ID ^a	Depth	Matrix	Sample Date	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	-	-	-	g/kg	g	g	%(w/w)
TP18	1.5 - 1.7 m	Fill (SP2)	14/12/2021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	9	<0.4	17	12	20	<0.1	7	23	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001
TP18	2 - 2.2 m	Fill (SP2)	14/12/2021	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 NL 215 NL - - 2500 - 2500 - 6600 - 6600 9 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	9	<0.4	17	12	20	<0.1	7	23	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
TP19	0 - 0.2 m	Fill (SP2)	14/12/2021	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	8	<0.4	19	12	20	<0.1	8	20	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
TP19	0.7 - 0.9 m	Fill (SP2)	14/12/2021	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
TP19	1.7 - 1.9 m	Fill (SP2)	14/12/2021	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	7	<0.4	18	18	18	<0.1	8	21	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 NL 215 NL - - 2500 - 2500 - 6600 - 6600 9 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
TP20	0 - 0.2 m	Fill (SP2)	14/12/2021	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	9	<0.4	19	14	25	<0.1	8	31	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
TP20	1 - 1.2 m	Natural	14/12/2021	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	9	<0.4	18	12	22	<0.1	7	23	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
BD5/20211214	1 - 1.2 m	Natural	14/12/2021	3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 2500 - 2000 - 7 -	10	<0.4	19	14	24	<0.1	7	26	<25	<50	NT	<25	<50	<100	NT	<100	NT	<																				

Table I1: Summary of Laboratory Results for Site Suitability

				Metals								TRH								BTEX				PAH									Asbestos								
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 (SGC) ¹	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F3 (>C16-C34) (SGC)	F4 (>C34-C40)	F4 (>C34-C40) (SGC)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	All OCP c d	OPP e	Total PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation		
			PQL	4	0.4	1	1	1	0.1	1	1	25	50	50	25	50	100	100	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001		
Sample ID ^a	Depth	Matrix	Sample Date	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	-	-	-	g/kg	g	g	%(w/w)
TP111	0.9 - 1.1 m	Natural	18/07/2022	6	<0.4	13	25	18	<0.1	12	34	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP112	0 - 0.2 m	Fill	18/07/2022	7	<0.4	15	22	22	<0.1	8	49	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP113	0 - 0.2 m	Fill	18/07/2022	10	<0.4	19	19	27	<0.1	7	24	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP113	0.3 - 0.5 m	Natural	18/07/2022	6	<0.4	14	24	21	<0.1	11	34	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP114	0 - 0.2 m	Fill	18/07/2022	8	<0.4	18	11	30	<0.1	7	18	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP114	0.8 - 1 m	Natural	18/07/2022	7	<0.4	11	23	16	<0.1	11	44	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
BD1/20220718	0.8 - 1 m	Natural	18/07/2022	10	<1	17	31	15	<0.1	11	43	<10	<50	NT	<10	<50	<100	NT	<100	NT	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP115	0 - 0.2 m	Natural	18/07/2022	5	<0.4	14	25	16	<0.1	10	32	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP116	0 - 0.2 m	Fill	18/07/2022	7	<0.4	15	12	22	<0.1	7	30	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP117	0 - 0.2 m	Fill	18/07/2022	8	<0.4	18	12	26	<0.1	8	23	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP117	0.45 - 0.6 m	Natural	18/07/2022	5	<0.4	14	27	15	<0.1	10	34	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP118	0.5 - 0.7 m	Fill (SP2)	18/07/2022	7	<0.4	17	11	20	<0.1	6	18	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<															

Table I1: Summary of Laboratory Results for Site Suitability

				Metals								TRH								BTEX				PAH									Asbestos									
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 (SGC) ¹	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F3 (>C16-C34) (SGC)	F4 (>C34-C40)	F4 (>C34-C40) (SGC)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	All OCP c d	OPP e	Total PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation			
			PQL	4	0.4	1	1	1	0.1	1	1	25	50	50	25	50	100	100	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001			
Sample ID ^a	Depth	Matrix	Sample Date	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	-	-	-	g/kg	g	g	%(w/w)
TP126	0.1 - 0.2 m	Fill (SP11)	19/07/2022	4	<0.4	16	56	44	<0.1	13	430	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP126	0.9 - 1 m	Fill (SP11)	19/07/2022	5	0.9	23	58	68	<0.1	15	250	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP126	1 - 1.1 m	Natural	19/07/2022	<4	<0.4	15	21	10	<0.1	8	19	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
BD4/20220719	1 - 1.1 m	Natural	19/07/2022	5	<0.4	15	20	11	<0.1	9	17	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP126A	0.5 - 0.6 m	Fill (SP11)	19/07/2022	5	<0.4	15	42	49	0.1	10	85	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP126A	0.8 - 0.9 m	Fill (SP11)	19/07/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001		
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP127	0.4 - 0.5 m	Fill (SP10)	19/07/2022	6	<0.4	18	1900	77	<0.1	17	250	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001		
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP127	0.9 - 1 m	Fill (SP10)	19/07/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001		
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP127	1 - 1.1 m	Natural	19/07/2022	<4	<0.4	16	19	13	<0.1	10	17	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP128	0.1 - 0.2 m	Fill (SP10)	19/07/2022	5	<0.4	19	57	42	<0.1	16	180	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP128	0.4 - 0.5 m	Fill (SP10)	19/07/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001		
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP128	1 - 1.1 m	Fill (SP10)	19/07/2022	5	<0.4	17	88	75	<0.1	18	280	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001			
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 480 215 NL - - 2500 - 2500 - 6600 - 6600 6 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP129	0.1 - 0.2 m	Fill (SP8)	19/07/2022	6	0.4	19	120	70	<0.1	16	1200	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP129	0.4 - 0.5 m	Fill (SP8)	19/07/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001			
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45 640 2000 - 7 -																																						
TP129	0.9 - 1 m	Fill (SP8)	19/07/2022	6	<0.4	19	29	37	<0.1	11	61	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001			
				3000 160 900 - 3600 1200 240000 320 1500 1800 730 - 6000 350 400000 900 - - - 170 - 170 310 215 NL - - 2500 - 2500 - 6600 - 6600 4 95 NL 135 NL 185 NL 95 NL 370 - 172 40 - 4000 - 660 - 45																																						

Table I1: Summary of Laboratory Results for Site Suitability

				Metals								TRH								BTEX				PAH									Asbestos								
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 (SGC) ¹	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F3 (>C16-C34) (SGC)	F4 (>C34-C40)	F4 (>C34-C40) (SGC)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	All OCP c d	OPP e	Total PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation		
			PQL	4	0.4	1	1	1	0.1	1	1	25	50	50	25	50	100	100	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001		
Sample ID ^a	Depth	Matrix	Sample Date	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	-	-	-	g/kg	g	g	%(w/w)
TP132	1.7 - 1.8 m	Fill (SP3)	19/07/2022	7	<0.4	17	14	21	<0.1	5	22	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	480 215	NL -	- 2500	- 2500	- 6600	- 6600	6 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP132A	0.4 - 0.5 m	Fill (SP3)	19/07/2022	8	<0.4	32	24	37	<0.1	7	96	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	0.2	<0.5	1.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP132A	1.4 - 1.5 m	Fill (SP3)	19/07/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	480 215	NL -	- 2500	- 2500	- 6600	- 6600	6 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP133	0.6 - 0.7 m	Fill (SP1)	19/07/2022	6	<0.4	13	12	19	<0.1	6	17	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP133	1.2 - 1.3 m	Fill (SP1)	19/07/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	480 215	NL -	- 2500	- 2500	- 6600	- 6600	6 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP133	2.9 - 3 m	Fill (SP1)	19/07/2022	5	<0.4	12	15	18	<0.1	6	22	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	NL 215	NL -	- 2500	- 2500	- 6600	- 6600	9 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP134	0.1 - 0.2 m	Fill (SP1)	19/07/2022	6	<0.4	15	11	17	<0.1	6	16	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP134	0.9 - 1 m	Fill (SP1)	19/07/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP134	1.9 - 2 m	Fill (SP1)	19/07/2022	7	<0.4	16	13	19	<0.1	6	20	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	480 215	NL -	- 2500	- 2500	- 6600	- 6600	6 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP134	3.4 - 3.5 m	Fill (SP1)	19/07/2022	4	<0.4	10	17	19	<0.1	8	30	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	NL 215	NL -	- 2500	- 2500	- 6600	- 6600	9 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP135	0.5 - 0.6 m	Fill (SP1)	19/07/2022	7	<0.4	16	12	23	<0.1	6	18	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP135	1.5 - 1.6 m	Fill (SP1)	19/07/2022	6	<0.4	12	9	17	<0.1	5	16	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	&													

Table I1: Summary of Laboratory Results for Site Suitability

				Metals								TRH								BTEX				PAH									Asbestos								
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 (SGC) ^f	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F3 (>C16-C34) (SGC)	F4 (>C34-C40)	F4 (>C34-C40) (SGC)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	All OCP c d	OPP e	Total PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation		
			PQL	4	0.4	1	1	1	0.1	1	1	25	50	50	25	50	100	100	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001		
Sample ID ^a	Depth	Matrix	Sample Date	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	-	-	-	g/kg	g	g	%(w/w)
BD1/20220720	1.4 - 1.5 m	Natural	20/07/2022	6	<0.4	12	23	12	<0.1	6	27	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP140	0.1 - 0.2 m	Fill	20/07/2022	<4	<0.4	8	57	14	<0.1	41	28	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP141	0.1 - 0.2 m	Fill	20/07/2022	<4	<0.4	7	12	170	0.2	1	66	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	0.2	<0.5	1	<5	<0.1	<0.1	<0.1	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP141	0.4 - 0.5 m	Natural	20/07/2022	4	<0.4	15	12	11	<0.1	5	9	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP142	0.1 - 0.2 m	Fill	20/07/2022	5	<0.4	9	8	13	<0.1	5	14	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP143	0.1 - 0.2 m	Fill	20/07/2022	5	<0.4	12	12	15	<0.1	4	10	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP144	0.1 - 0.2 m	Fill	20/07/2022	6	<0.4	12	14	16	<0.1	6	16	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NT	NT	NT	NT	NT		
TP144	0.3 - 0.4 m	Natural	20/07/2022	5	<0.4	14	17	12	<0.1	6	21	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
BD2/20220720	0.3 - 0.4 m	Natural	20/07/2022	9	<1	22	24	15	<0.1	9	34	<10	<50	NT	<10	<50	<100	NT	<100	NT	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NT	NT	NT	NT	NT	NT		
TP145	0.1 - 0.2 m	Fill	20/07/2022	8	<0.4	17	16	17	<0.1	6	18	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP146	0.1 - 0.2 m	Fill	20/07/2022	5	<0.4	13	14	13	<0.1	5	15	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001		
TP147	0.1 - 0.2 m	Fill	20/07/2022	5	<0.4	12	18	12	<0.1	6	21	<																													

Table I1: Summary of Laboratory Results for Site Suitability

				Metals								TRH										BTEX				PAH									Asbestos							
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 (SGC) ¹	F1 (C6-C10 less BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F3 (>C16-C34) (SGC)	F4 (>C34-C40)	F4 (>C34-C40) (SGC)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	All OCP c d	OPP e	Total PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation			
			PQL	4	0.4	1	1	1	0.1	1	1	25	50	50	25	50	100	100	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001			
Sample ID ^a	Depth	Matrix	Sample Date	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	-	-	-	g/kg	g	g	%(w/w)
TP161	0.1 - 0.2 m	Fill	20/07/2022	4	<0.4	12	20	13	<0.1	8	24	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP162	0.1 - 0.2 m	Fill	21/07/2022	<4	<0.4	33	30	6	<0.1	49	28	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	0.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP163	0.1 - 0.2 m	Fill	21/07/2022	6	<0.4	13	15	15	<0.1	8	18	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP164	0.1 - 0.2 m	Fill	21/07/2022	7	<0.4	20	11	16	<0.1	8	15	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP164	0.3 - 0.4 m	Natural	21/07/2022	8	<0.4	20	20	17	<0.1	8	17	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP165	0.1 - 0.2 m	Fill	21/07/2022	4	<0.4	12	20	12	<0.1	9	20	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP166	0 - 0.1 m	Fill	21/07/2022	<4	<0.4	50	26	5	<0.1	56	31	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	0.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP166	0.2 - 0.3 m	Fill	21/07/2022	<4	<0.4	5	2	12	<0.1	7	29	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP166	0.3 - 0.4 m	Fill	21/07/2022	6	<0.4	13	10	18	<0.1	7	16	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
TP166	0.5 - 0.6 m	Natural	21/07/2022	5	<0.4	10	20	15	<0.1	19	29	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
BH167	0.2 - 0.3 m	Fill	21/07/2022	5	<0.4	13	21	15	<0.1	8	27	<25	<50	NT	<25	<50	<100	NT	<100	NT	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001			
				3000 160 900 -	3600 1200	240000 320	1500 1800	730 -	6000 350	400000 900	- -	- 170	- 170	310 215	NL -	- 2500	- 2500	- 6600	- 6600	4 95	NL 135	NL 185	NL 95	NL 370	- 172	40 -	4000 -	660 -	45 640	2000 -	7 -	-	-	-	-	-	-	-	-	-		
BH167	0.9 - 1 m	Natural	21/07/2022	6	<0.4	13	21	11	<0.1	6	29																															


 HIL/HSL exceedance
 EIL/ESL exceedance
 HIL/HSL and EIL/ESL exceedance
 ML exceedance
 ML and HIL/HSL or EIL/ESL exceedance

HIL/HSL value EIL/ESL value

Indicates that asbestos has been detected by the lab, refer to the lab report
Blue = DC exceedance HSL 0<-1 Exceedance

Bold = Lab detections NT = Not tested - = No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

a	QA/QC replicate of sample listed directly below the primary sample
b	Reported naphthalene laboratory result obtained from BTEXN suite
c	HIL criteria applies to aldrin & dieldrin only
d	EIL criteria applies to DDT only
e	HIL criteria applies to chlorpyrifos only
f	Silica Gel Cleanup
ACM	ACM samples are material samples.
Triplicate	Where lab triplicate has been analysed and reported for QA purposes, the higher respective metal concentration is summarised in this table.
Fill	Fill matrix also including material logged as topsoil

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Commercial/ industrial D	
HIL D	Commercial / Industrial (NEPC, 2013)
HSL D	Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D	Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/I/nd	Commercial and Industrial (NEPC, 2013)
ML C/I/nd	Commercial and Industrial (NEPC, 2013)

Table I2: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH					BTEX				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB	Herbicides	Asbestos							
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)		Total PAHs	Total Endosulfan				Total Analysed OCP ^d	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001	
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	-	-	g	g	g	%(w/w)			
Previous Investigation (DP, 2021) - 1050-1064 Mamre Road																																					
TP2	0.1 - 0.2 m	7/09/2021	Natrual	11	<0.4	22	14	25	NT	<0.1	9	NT	27	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NT	NT	NT	NT	
TP4	0.1 - 0.2 m	7/09/2021	Natrual	10	<0.4	19	12	21	NT	<0.1	8	NT	30	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NT	NT	NT	NT	
TP6	0.1 - 0.2 m	7/09/2021	Fill	7	<0.4	13	16	15	NT	<0.1	7	NT	28	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NT	NT	NT	NT	
TP6	0.5 - 0.6 m	7/09/2021	Natrual	5	<0.4	10	18	9	NT	<0.1	4	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP8	0.1 - 0.2 m	7/09/2021	Natrual	6	<0.4	17	30	17	NT	<0.1	19	NT	52	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP8	0.5 - 0.6 m	7/09/2021	Natrual	5	<0.4	19	26	16	NT	<0.1	19	NT	49	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NT	NT	NT	NT	
TP9	0.5 - 0.6 m	7/09/2021	Fill	11	<0.4	18	22	16	NT	<0.1	16	NT	40	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NT	NT	NT	NT	
TP10	0.1 - 0.2 m	7/09/2021	Natrual	5	<0.4	17	33	14	NT	<0.1	13	NT	32	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP10	0.5 - 0.6 m	7/09/2021	Natrual	8	<0.4	19	33	18	NT	<0.1	20	NT	53	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP12	0.1 - 0.2 m	7/09/2021	Natrual	7	<0.4	13	15	15	NT	<0.1	9	NT	27	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP12	0.5 - 0.6 m	7/09/2021	Natrual	6	<0.4	14	38	16	NT	<0.1	17	NT	51	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BD2	0.5 - 0.6 m	7/09/2021	Natrual	6	<0.4	13	34	15	NT	<0.1	15	NT	45	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BH14	0.1 - 0.2 m	7/09/2021	Natrual	10	<0.4	19	24	19	NT	<0.1	6	NT	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
BH14	0.4 - 0.5 m	7/09/2021	Natrual	10	<0.4	18	23	13	NT	<0.1	5	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP18	0.1 - 0.2 m	7/09/2021	Natrual	9	<0.4	20	13	25	NT	<0.1	6	NT	23	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP18	0.5 - 0.6 m	7/09/2021	Natrual	6	<0.4	19	21	12	NT	<0.1	7	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP19	0.1 - 0.2 m	7/09/2021	Natrual	10	<0.4	19	19	20	NT	<0.1	6	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP19	0.5 - 0.6 m	7/09/2021	Natrual	9	<0.4	18	23	15	NT	<0.1	5	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BD5	0.5 - 0.6 m	7/09/2021	Natrual	9	<0.4	15	17	11	NT	<0.1	4	NT	16	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP20	0.1 - 0.2 m	7/09/2021	Natrual	9	<0.4	20	16	15	NT	<0.1	8	NT	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP20	0.5 - 0.6 m	7/09/2021	Natrual	7	<0.4	19	24	14	NT	<0.1	6	NT	17	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
SS1	0-0.1	6/09/2021	Fill	<4	<0.4	14	8	12	NT	<0.1	16	NT	43	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	NAD	<0.001	
SS2	0-0.1	6/09/2021	Fill	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
SS3	0-0.1	6/09/2021	Fill	<4	<0.4	14	8	11	NT	<0.1	13	NT	33	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
SS8	0-0.1	6/09/2021	Fill	<4	<0.4	10	9	120	0.2	0.1	2	NT	46	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	0.2	1.3	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
SS9	0-0.1	6/09/2021	Fill	<4	<0.4	8	12	180	0.2	0.1	1	NT	62	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	0.2	1.2	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
SS10	0-0.1	7/09/2021	Fill	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
SS11	0-0.1	7/09/7																																			

Table I2: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH					BTEX				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB		Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos					
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)		Total PAHs	Total Endosulfan							Total Analysed OCP ^d	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001		
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	-	-	g	g	g	%(w/w)			
BD1/20211213	0 - 0.1 m	13/12/2021	Natural	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT			
TP7	0 - 0.1 m	14/12/2021	Natural	10	<0.4	18	11	24	NT	<0.1	7	NT	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<PQL	NT	NAD	NAD	NAD	NAD	<0.001		
TP7	0.4 - 0.5 m	14/12/2021	Natural	6	<0.4	16	27	19	NT	<0.1	14	NT	36	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP8	0 - 0.2 m	14/12/2021	Natural	6	<0.4	12	16	21	NT	<0.1	10	NT	33	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP8	0.4 - 0.5 m	14/12/2021	Natural	5	<0.4	17	28	13	NT	<0.1	9	NT	34	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP9	0 - 0.1 m	14/12/2021	Natural	7	<0.4	16	15	20	NT	<0.1	12	NT	26	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	<0.001		
TP10	0 - 0.2 m	14/12/2021	Natural	6	<0.4	16	21	14	NT	<0.1	8	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP10	0.4 - 0.5 m	14/12/2021	Natural	13	<0.4	20	33	34	NT	<0.1	18	NT	47	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP11	0 - 0.1 m	14/12/2021	Natural	5	<0.4	15	17	14	NT	<0.1	7	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP12	0 - 0.1 m	14/12/2021	Fill (SP1)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP12	0.4 - 0.5 m	14/12/2021	Fill (SP1)	7	<0.4	15	15	18	NT	<0.1	6	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<PQL	NT	NAD	NAD	NAD	NAD	<0.001		
TP13	0 - 0.1 m	14/12/2021	Fill (SP1)	8	<0.4	17	16	20	NT	<0.1	7	NT	34	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP13	0.4 - 0.5 m	14/12/2021	Fill (SP1)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP13	1 - 1.2 m	14/12/2021	Fill (SP1)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP14	0 - 0.1 m	14/12/2021	Fill (SP1)	9	<0.4	17	14	18	NT	<0.1	6	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP14	0.4 - 0.5 m	14/12/2021	Fill (SP1)	8	<0.4	15	17	19	NT	<0.1	8	NT	29	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP15	0 - 0.1 m	14/12/2021	Fill (SP4)	6	<0.4	36	28	40	NT	0.1	7	NT	170	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	0.2	1.2	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP15	0.4 - 0.5 m	14/12/2021	Fill (SP4)	7	<0.4	40	27	42	NT	<0.1	7	NT	170	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	0.2	1.6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BD3/20211214	0.4 - 0.5 m	14/12/2021	Fill (SP4)	6	<0.4	33	19	29	NT	<0.1	6	NT	91	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	0.2	1.6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP16	0 - 0.2 m	14/12/2021	Fill	6	<0.4	4	18	7	NT	<0.1	3	NT	23	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP16	0.7 - 0.9 m	14/12/2021	Natural	9	<0.4	16	24	22	NT	<0.1	12	NT	35	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP17	0 - 0.2 m	14/12/2021	Fill (SP2)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP17	0.8 - 1 m	14/12/2021	Fill (SP2)	9	<0.4	19	11	24	NT	<0.1	7	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP17	1.6 - 1.8 m	14/12/2021	Fill (SP2)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP17	2.2 - 2.4 m	14/12/2021	Fill (SP2)	8	<0.4	16	14	23	NT	<0.1	7	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	<0															

Table I2: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH					BTEX				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB	Herbicides	Asbestos						
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)		Total PAHs	Total Endosulfan				Total Analysed OCP ^d	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	-	-	g	g	g	%(w/w)	
Current Investigation																																				
TP101	0.1 - 0.2 m	18/07/2022	Fill	7	<0.4	17	15	23	NT	<0.1	8	NT	25	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
TP102	0.1 - 0.2 m	18/07/2022	Fill	7	<0.4	17	17	22	NT	<0.1	7	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP102	0.2 - 0.3 m	18/07/2022	Natural	7	<0.4	13	31	23	NT	<0.1	20	NT	56	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP103	0 - 0.1 m	18/07/2022	Natural	5	<0.4	12	21	12	NT	<0.1	8	NT	25	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP104	0.1 - 0.2 m	18/07/2022	Fill	7	<0.4	18	12	21	NT	<0.1	6	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP105	0 - 0.1 m	18/07/2022	Fill	9	<0.4	20	13	27	NT	<0.1	7	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP106	0 - 0.2 m	18/07/2022	Fill	8	<0.4	19	17	22	NT	<0.1	8	NT	26	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP106	0.2 - 0.3 m	18/07/2022	Natural	6	<0.4	17	22	15	NT	<0.1	8	NT	25	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP107	0 - 0.2 m	18/07/2022	Fill (SP2)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP107	0.5 - 0.7 m	18/07/2022	Fill (SP2)	5	<0.4	16	9	18	NT	<0.1	6	NT	13	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP107	1 - 1.2 m	18/07/2022	Natural	6	<0.4	11	24	17	NT	<0.1	13	NT	47	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP108	0 - 0.2 m	18/07/2022	Fill	10	<0.4	21	12	26	NT	<0.1	8	NT	23	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP109	0 - 0.2 m	18/07/2022	Fill	8	<0.4	18	13	23	NT	<0.1	6	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP109	0.7 - 0.9 m	18/07/2022	Natural	7	<0.4	18	24	19	NT	<0.1	10	NT	30	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP110	0.5 - 0.7 m	18/07/2022	Fill (SP1)	8	<0.4	16	16	22	NT	<0.1	9	NT	29	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP110	1 - 1.2 m	18/07/2022	Fill (SP1)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP110	1.3 - 1.5 m	18/07/2022	Natural	7	<0.4	13	22	16	NT	<0.1	9	NT	32	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP111	0 - 0.2 m	18/07/2022	Fill (SP3)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP111	0.5 - 0.7 m	18/07/2022	Fill (SP3)	6	<0.4	36	22	40	NT	<0.1	7	NT	120	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.2	1.8	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP111	0.9 - 1.1 m	18/07/2022	Natural	6	<0.4	13	25	18	NT	<0.1	12	NT	34	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP112	0 - 0.2 m	18/07/2022	Fill	7	<0.4	15	22	22	NT	<0.1	8	NT	49	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP113	0 - 0.2 m	18/07/2022	Fill	10	<0.4	19	19	27	NT	<0.1	7	NT	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP113	0.3 - 0.5 m	18/07/2022	Natural	6	<0.4	14	24	21	NT	<0.1	11	NT	34	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP114	0 - 0.2 m	18/07/2022	Fill	8	<0.4	18	11	30	NT	<0.1	7	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP114	0.8 - 1 m	18/07/2022	Natural	7	<0.4	11	23	16	NT	<0.1	11	NT	44	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BD1/20220718	0.8 - 1 m	18/07/2022	Natural	10	<1	17	31	15	NT	<0.1	11	NT	43	<10	<50</																					

Table I2: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH					BTEX				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos				
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(e)pyrene (BaP)		Total PAHs	Total Endosulfan						Total Analysed OCP ^d	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	g	g	g	%(w/w)	
TP122	0.1 - 0.2 m	19/07/2022	Fill	6	<0.4	16	12	18	NT	<0.1	7	NT	16	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP122	0.3 - 0.4 m	19/07/2022	Natural	4	<0.4	16	21	11	NT	<0.1	7	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BD2/20220719	0.3 - 0.4 m	19/07/2022	Natural	5	<0.4	16	20	13	NT	<0.1	8	NT	16	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP123	0.1 - 0.2 m	19/07/2022	Fill	7	<0.4	16	12	21	NT	<0.1	8	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP124	0.1 - 0.2 m	19/07/2022	Fill (SP2)	8	<0.4	17	12	25	NT	<0.1	9	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP124	0.9 - 1 m	19/07/2022	Fill (SP2)	6	<0.4	17	12	20	NT	<0.1	9	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP124	1.8 - 1.9 m	19/07/2022	Natural	4	<0.4	14	20	14	NT	<0.1	7	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BD3/20220719	1.8 - 1.9 m	19/07/2022	Natural	7	<1	23	26	12	NT	<0.1	11	NT	25	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP125	0.1 - 0.2 m	19/07/2022	Fill (SP12)	5	0.5	18	47	82	NT	<0.1	8	NT	210	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP125	0.9 - 1 m	19/07/2022	Fill (SP12)	4	<0.4	14	43	62	NT	<0.1	8	NT	180	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP125	1 - 1.1 m	19/07/2022	Natural	5	<0.4	16	18	13	NT	<0.1	8	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP125A	0.5 - 0.6 m	19/07/2022	Fill (SP12)	8	0.4	18	73	370	<0.03	<0.1	11	NT	230	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP125A	0.8 - 0.9 m	19/07/2022	Fill (SP12)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	AD	NAD	0.1512	0.0189
TP126	0.1 - 0.2 m	19/07/2022	Fill (SP11)	4	<0.4	15	40	44	NT	<0.1	12	NT	160	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP126 - [TRIPLICATE]	0.1 - 0.2 m	19/07/2022	Fill (SP11)	<4	<0.4	16	56	42	NT	<0.1	13	NT	430	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP126	0.9 - 1 m	19/07/2022	Fill (SP11)	5	0.9	23	58	68	NT	<0.1	15	NT	250	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP126	1 - 1.1 m	19/07/2022	Natural	<4	<0.4	15	21	10	NT	<0.1	8	NT	19	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BD4/20220719	1 - 1.1 m	19/07/2022	Natural	5	<0.4	15	20	11	NT	<0.1	9	NT	17	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP126A	0.5 - 0.6 m	19/07/2022	Fill (SP11)	5	<0.4	15	42	49	NT	0.1	10	NT	85	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP126A	0.8 - 0.9 m	19/07/2022	Fill (SP11)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP127	0.4 - 0.5 m	19/07/2022	Fill (SP10)	6	<0.4	18	1900	77	NT	<0.1	17	NT	250	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP127	0.9 - 1 m	19/07/2022	Fill (SP10)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP127	1 - 1.1 m	19/07/2022	Natural	<4	<0.4	16	19	13	NT	<0.1	10	NT	17	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP128	0.1 - 0.2 m	19/07/2022	Fill (SP10)	5	<0.4	19	57	42	NT	<0.1	16	NT	180	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001</

Table 12: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH						BTEx				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos				
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)	Total PAHs		Total Endosulfan	Total Analysed OCP ^d						Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001	
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	-	-	g	g	g	%(w/w)			
TP131A	0.4 - 0.5 m	19/07/2022	Fill (SP4)	5	<0.4	32	21	34	NT	<0.1	8	NT	130	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.2	2.8	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP131A	1.4 - 1.5 m	19/07/2022	Fill (SP4)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001			
TP132	0.1 - 0.2 m	19/07/2022	Fill (SP3)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001			
TP132	0.4 - 0.5 m	19/07/2022	Fill (SP3)	9	<0.4	40	28	48	NT	0.2	9	NT	140	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.2	2.3	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP132	1.4 - 1.5 m	19/07/2022	Fill (SP3)	9	<0.4	36	25	42	NT	0.1	7	NT	99	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.3	4.4	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP132	1.7 - 1.8 m	19/07/2022	Fill (SP3)	7	<0.4	17	14	21	NT	<0.1	5	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP132A	0.4 - 0.5 m	19/07/2022	Fill (SP3)	8	<0.4	32	24	37	NT	<0.1	7	NT	96	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.2	1.8	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP132A	1.4 - 1.5 m	19/07/2022	Fill (SP3)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP133	0.6 - 0.7 m	19/07/2022	Fill (SP1)	6	<0.4	13	12	19	NT	<0.1	6	NT	17	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP133	1.2 - 1.3 m	19/07/2022	Fill (SP1)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP133	2.9 - 3 m	19/07/2022	Fill (SP1)	5	<0.4	12	15	18	NT	<0.1	6	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP134	0.1 - 0.2 m	19/07/2022	Fill (SP1)	6	<0.4	15	11	17	NT	<0.1	6	NT	16	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP134	0.9 - 1 m	19/07/2022	Fill (SP1)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP134	1.9 - 2 m	19/07/2022	Fill (SP1)	7	<0.4	16	13	19	NT	<0.1	6	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP134	3.4 - 3.5 m	19/07/2022	Fill (SP1)	4	<0.4	10	17	19	NT	<0.1	8	NT	30	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP135	0.5 - 0.6 m	19/07/2022	Fill (SP1)	7	<0.4	16	12	23	NT	<0.1	6	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP135	1.5 - 1.6 m	19/07/2022	Fill (SP1)	6	<0.4	12	9	17	NT	<0.1	5	NT	16	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
BD7/20220719	1.5 - 1.6 m	19/07/2022	Fill (SP1)	8	<1	14	16	21	NT	<0.1	9	NT	34	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP135	3.5 - 3.6 m	19/07/2022	Fill (SP1)	5	<0.4	12	11	17	NT	<0.1	6	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP136	0.1 - 0.2 m	19/07/2022	Fill (SP2)	8	<0.4	16	11	24	NT	<0.1	7	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP136	0.5 - 0.6 m	19/07/2022	Fill (SP2)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP136	1.5 - 1.6 m	19/07/2022	Fill (SP2)	7	<0.4	17	11	22	NT	<0.1	6	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP136	2.5 - 2.6 m	19/07/2022	Fill (SP2)	7	<0.4	16	11	19	NT	<0.1	6	NT	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP136	2.8 - 2.9 m	19/07/2022	Natural	6	<0.4	14	17	16	NT	<0.1	8	NT	23	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP137	0.1 - 0.2 m	19/07/2022	Fill (SP2)	5	<0.4	14	9	17	NT	<0.1	5	NT	16	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP137	1 - 1.1 m	19/07/2022	Fill (SP2)	5	<0.4	12	10	15	NT	<0.1	6	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP137	2.5 - 2.6 m	19/07/2022	Fill (SP2)	6	<0.4	15	10	18	NT	<0.1	5	NT	17	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP137	3.5 - 3.6 m	19/07/2022	Natural	5	<0.4	14	19	13	NT	<0.1	9	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP138	0.1 - 0.2 m	19/07/2022	Fill (SP6)	4	<0.4	11	15	28	NT	<0.1	5	NT	85	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	AD	NAD	0.0142	0.002	
TP138	0.5 - 0.6 m	19/07/2022	Fill (SP6)	4	<0.4	13	16	24	NT	<0.1	5	NT	74	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	AD	NAD	0.0026	<0.001		
TP138	0.9 - 1 m	19/07/2022	Fill (SP6)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP138	1 - 1.1 m	19/07/2022	Natural	4	<0.4	13	15	13	NT	<0.1	4	NT	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP138A	0.7 - 0.8 m	19/07/2022	Fill (SP6)	<4	<0.4	11	16	23	NT	<0.1	6	NT	79	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.1	0.56	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP139	0.1 - 0.2 m	20/07/2022	Fill (SP17)	<4	<0.4	6	9	76	NT	<0.1	1	NT	33	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP139	0.5 - 0.6 m	20/07/2022	Fill (SP17)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP139	1 - 1.1 m	20/07/2022	Fill (SP17)	<4	<0.4	5	9	44	NT	<0.1	<1	NT	19	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP139 - [TRIPLICATE]	1 - 1.1 m	20/07/2022	Fill (SP17)	<4	<0.4	6	8	55	NT	<0.1	1	NT	26	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
TP139	1.2 - 1.3 m	20/07/2022	Fill (SP17)	6	<0.4	10	9	14	NT	<0.1	4	NT	19	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001		
TP139	1.4 - 1.5 m	20/07/2022	Natural	7	<0.4	11	27	13	NT	<0.1	14	NT	67	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BD1/20220720	1.4 - 1.5 m	2																																			

Table I2: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH					BTEX				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB	Herbicides	Asbestos						
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)		Total PAHs	Total Endosulfan				Total Analysed OCP ^d	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	g	g	g	%(w/w)	
TP142	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	9	8	13	NT	<0.1	5	NT	14	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP143	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	12	12	15	NT	<0.1	4	NT	10	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP144	0.1 - 0.2 m	20/07/2022	Fill	6	<0.4	12	14	16	NT	<0.1	6	NT	16	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NT	NT	NT
TP144	0.3 - 0.4 m	20/07/2022	Natural	5	<0.4	14	17	12	NT	<0.1	6	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BD2/20220720	0.3 - 0.4 m	19/07/2022	Natural	9	<1	17	24	15	NT	<0.1	9	NT	34	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP145	0.1 - 0.2 m	20/07/2022	Fill	8	<0.4	17	16	17	NT	<0.1	6	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP146	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	13	14	13	NT	<0.1	5	NT	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP147	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	12	18	12	NT	<0.1	6	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP148	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	13	14	13	NT	<0.1	6	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP148	0.3 - 0.4 m	20/07/2022	Natural	5	<0.4	15	19	12	NT	<0.1	7	NT	22	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP149	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	14	18	11	NT	<0.1	8	NT	19	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NT	NT	NT
TP149	0.4 - 0.5 m	20/07/2022	Fill	<4	<0.4	5	3	5	NT	<0.1	4	NT	14	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP149	0.9 - 1 m	20/07/2022	Fill	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP149	1 - 1.1 m	20/07/2022	Natural	<4	<0.4	4	5	5	NT	<0.1	2	NT	11	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP150	0.1 - 0.2 m	20/07/2022	Fill	6	<0.4	15	18	13	NT	<0.1	7	NT	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP151	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	12	16	15	NT	<0.1	7	NT	29	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP152	0.1 - 0.2 m	20/07/2022	Fill	<4	<0.4	11	19	27	NT	<0.1	11	NT	39	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.2	2	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP152	0.4 - 0.5 m	20/07/2022	Natural	6	<0.4	15	20	10	NT	<0.1	5	NT	17	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP153	0.1 - 0.2 m	20/07/2022	Fill	5	<0.4	12	17	17	NT	<0.1	6	NT	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP154	0.1 - 0.2 m	20/07/2022	Fill	4	<0.4	9	16	12	NT	<0.1	7	NT	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP155	0.1 - 0.2 m	20/07/2022	Fill	11	<0.4	12	17	18	NT	<0.1	10	NT	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP155	0.3 - 0.4 m	20/07/2022	Fill	9	<0.4	13	27	11	NT	<0.1	8	NT	26	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP156	0.1 - 0.2 m	20/07/2022	Fill	7	<0.4	12	18	15	NT	<0.1	7	NT	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP157	0.1 - 0.2 m	20/07/2022	Fill	4	<0.4	12	18	13	NT	<0.1	9	NT	22	<25	<50	<100	<100	<50																		

Table I2: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH					BTEX				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB	Herbicides	Asbestos ID in Material	Trace Analysis	Asbestos					
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)		Total PAHs	Total Endosulfan						Total Analysed OCP ^d	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001	
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	g	g	g	%(w/w)		
BH168	1.1 - 1.2 m	21/07/2022	Natural	6	<0.4	13	27	20	NT	<0.1	9	NT	33	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BH169	0.2 - 0.3 m	21/07/2022	Fill	<4	<0.4	11	27	13	NT	<0.1	13	NT	30	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP170	0.1 - 0.2 m	27/07/2022	Fill	<4	<0.4	9	4	3	NT	<0.1	4	NT	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP170	0.7 - 0.9 m	27/07/2022	Fill	<4	<0.4	11	6	5	NT	<0.1	6	NT	57	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP170	1.1 - 1.2 m	27/07/2022	Fill	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP170	1.3 - 1.4 m	27/07/2022	Natural	5	<0.4	17	25	14	NT	<0.1	13	NT	28	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
BD1/20220727	1.3 - 1.4 m	27/07/2022	Natural	6	<0.4	17	27	18	NT	<0.1	13	NT	34	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
TP171	0.1 - 0.2 m	27/07/2022	Fill (SP5)	5	<0.4	13	13	13	NT	<0.1	7	NT	39	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP171	0.4 - 0.5 m	27/07/2022	Fill (SP5)	5	<0.4	16	13	13	NT	<0.1	8	NT	38	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP172	0.1 - 0.2 m	27/07/2022	Fill (SP13)	4	<0.4	10	15	10	NT	<0.1	9	NT	36	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP172	0.8 - 0.9 m	27/07/2022	Fill (SP13)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP172	1.6 - 1.7 m	27/07/2022	Fill (SP13)	5	<0.4	18	14	13	NT	<0.1	12	NT	37	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP172	1.9 - 2 m	27/07/2022	Natural	5	<0.4	16	24	18	NT	<0.1	11	NT	29	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
TP173	0.1 - 0.2 m	27/07/2022	Fill (SP14)	5	<0.4	28	33	30	NT	<0.1	16	NT	37	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP173	0.6 - 0.7 m	27/07/2022	Fill (SP14)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP174	0.1 - 0.2 m	27/07/2022	Fill (SP14)	8	<0.4	19	18	20	NT	<0.1	9	NT	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP174	0.6 - 0.7 m	27/07/2022	Fill (SP14)	5	<0.4	22	34	16	NT	<0.1	15	NT	57	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
BD2/20220727	0.6 - 0.7 m	27/07/2022	Fill (SP14)	10	<0.4	18	28	30	NT	<0.1	14	NT	36	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
TP174	1.1 - 1.2 m	27/07/2022	Natural	5	<0.4	17	22	14	NT	<0.1	10	NT	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
TP175	0.1 - 0.2 m	27/07/2022	Fill (SP14)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP175	0.6 - 0.7 m	27/07/2022	Fill (SP14)	12	<0.4	25	19	26	NT	<0.1	12	NT	52	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001
TP176	0.1 - 0.2 m	27/07/2022	Fill (SP15)	5	<0.4	18	13	19	NT	<0.1	6	NT	52	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP176	0.6 - 0.7 m	27/07/2022	Fill (SP15)	4	<0.4	19	9	15	NT	<0.1	5	NT	29	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	0.07	1.1	<5	<0.1	<0.1	<0.1	<0.1	NT	NT	NAD	NAD	NAD	NAD	<0.001	
TP176	1.1 - 1.2 m	27/07/2022	Natural	6	<0.4	16	27	15	NT	<0.1	11	NT	29	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
BD3/20220727	1.1 - 1.2 m	27/07/2022	Natural	6	<0.4	14	25	14	NT	<0.1	10	NT	30	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
ACM1	0.9 - 1.0 m	19/07/2022	Material (TP125 / SP12)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	AD	NT	NT	NT	NT	NT	
ACM2	0.4 - 0.5 m	19/07/2022	Material (TP127 / SP10)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	AD	NT	NT	NT	NT	NT	
ACM3	0.4 - 0.5 m	19/07/2022	Material (TP128 / SP10)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NT	NT	NT	NT	NT
ACM4	0.9 - 1.0 m	19/07/2022	Material (TP125 / SP12)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	AD	NT	NT	NT	NT	NT	NT
ACM5	0.9 - 1.0 m	19/07/2022	Material (TP126 / SP11)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT																							

Table I2: Summary of Laboratory Results for Preliminary Waste Classification

				Metals									TRH					BTEX				PAH		Total Analysed Phenol	OCP		Total Analysed Opp ^e	Total Analysed PCB	Herbicides	Asbestos							
				Arsenic	Cadmium	Total Chromium ^b	Copper	Lead	TCLP Lead	Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)		Total PAHs	Total Endosulfan				Total Analysed OCP ^d	Asbestos ID in Material	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	
			PQL ^f	4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	-	-	-	0.1	0.0001	0.0001	<0.001	
Sample ID ^a	Depth	Sample Date	Matrix	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	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	-	-	g	g	g	%(w/w)			
Waste Classification Criteria ^f																																					
CT1				100	20	100	NC	100	N/A	4	40	N/A	NC	650	NC	NC	NC	10000	10	288	600	1000	0.8	200	288	60	<50	4	<50	NC	NC	NC	NC	NC	NC	NC	
SCC1				500	100	1900	NC	1500	N/A	50	1050	N/A	NC	650	NC	NC	NC	10000	18	518	1080	1800	10	200	518	108	<50	7.5	<50	NC	NC	NC	NC	NC	NC	NC	
TCLP1				N/A	N/A	N/A	NC	N/A	5	N/A	N/A	2	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC	NC	NC	NC	NC	NC	NC	
VENM Classification Criteria ^f																																					
ANZECC (1992)				0.2-30	0.04-2	0.5-110	1-190	<2-200	N/A	0.001-0.1	2-400	N/A	2-180	NC	NC	NC	NC	NC	0.05 - 1	0.1 - 1	NC	NC	NC	0.95-5	0.03 – 0.5	0.5	0.03 – 0.5	NC	NC	NC	NC	NC	NC	NC	NC		
PQL				NC	NC	NC	NC	NC	N/A	NC	NC	N/A	NC	25	50	100	100	50	NC	NC	1	3	0.05	NC	NC	NC	NC	0.1	0.1	NC	NAD	NAD	NAD	NAD	NAD	NAD	
CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection VENM exceedance																																					

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

- Notes:
- a

QA/QC replicate of sample listed directly below the primary sample
- b

Total chromium used as initial screen for chromium(VI).
- c

Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
- d

Criteria for scheduled chemicals used as an initial screen
- e

Criteria for Chlorpyrifos used as initial screen
- f

All criteria are in the same units as the reported results
- ACM

ACM samples are material samples.
- Triplicate

Where lab triplicate has been analysed and reported for QA purposes, the higher respective metal concentration is summarised in this table.
- Fill

Fill matrix also including material logged as topsoil
- PQL

Practical quantitation limit
- CT1

NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
- SCC1

NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
- TCLP1

NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
- ANZECC (1992)

ANZECC/NHMRC (1992) Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites, Environmental Soil Quality Guidelines Background A [ANZECC A];

Appendix D

Borehole and Test Pit Logs from Previous Reports

Appendix D1

DP (2021)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 43.1 AHD
EASTING: 295786.1
NORTHING: 6251046.3

PIT No: TP1
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
42.0	0.2	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL, firm		E/D	0.1		PID = <5		
					0.2				
		Silty CLAY CI-CH: medium to high plasticity, orange-brown, w<PL, stiff to very stiff, residual			0.4				
				E/D	0.5		PID = <5		
				B	0.6				
					0.9				
				E/D	1.0		PID = <5		
					1.1				
					1.5				
				D	1.6				
41.0	2.0	Silty CLAY CI-CH: medium to high plasticity, orange and pale grey, trace angular siltstone gravel, w<PL, very stiff, residual		D	2.0				
					2.1				
		Below 2.3m: pale grey trace orange, hard			2.4				
	2.5	Pit discontinued at 2.5m Excavator refusal on weathered siltstone		D	2.5				
40.0	3								
39.0	4								

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, CBR bulk sample 0.4-0.9m

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.7 AHD
EASTING: 295889.6
NORTHING: 6251078.3

PIT No: TP2
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
45 1 44 2 2.1 43 3 42 4 41	0.25	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL, firm		E/D	0.1		PID = <5		
				E/D	0.2				
		Silty CLAY CL-CH: medium to high plasticity, orange-brown, w<PL, stiff to very stiff, residual			0.5		PID = <5		
				E/D	0.6				
					1.0		PID = <5		
				E/D	1.1				
					1.5				
		Below 1.5m: orange-yellow-grey, trace angular siltstone, hard		D	1.6				
					2.0				
				D	2.1				
	2.1	Pit discontinued at 2.1m Excavator refusal on weathered siltstone							

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.7 AHD
EASTING: 296015.4
NORTHING: 6251000.7

PIT No: TP3
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
47	0.3	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, trace sub-angular siltstone gravel, with organics and rootlets, w<PL, firm		E/D	0.1		PID = <5		
					0.2				
					0.3				
		Silty CLAY CI-CH: medium to high plasticity, orange, trace sub-angular siltstone gravel, w<PL, stiff to very stiff, residual		B	0.5		PID = <5		
				E/D	0.6				
46	1				1.0		PID = <5		
				E/D	1.1				
	1.4	Silty CLAY CI-CH: medium to high plasticity, orange and yellow-brown, with sub-angular siltstone gravel, w<PL, stiff to very stiff, residual			1.5				
				D	1.6				
45	2	Silty CLAY CI-CH: medium to high plasticity, pale grey and orange, w<PL, stiff to hard, residual			2.0				
				D	2.1				
					2.4				
				D	2.5				
44	3	Pit discontinued at 3.0m Target depth achieved							
	4								

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, CBR bulk sample 0.3-0.6m

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 52.1 AHD
EASTING: 296126.3
NORTHING: 6251048.1

PIT No: TP4
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
52.1	0.3	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL, firm		E/D	0.1		PID = <5		
					0.2				
	0.6	Silty CLAY CI-CH: medium to high plasticity, yellow-brown, w<PL, stiff to very stiff, residual		E/D	0.5		PID = <5		
					0.6				
	1.0	SILTSTONE: dark grey and pale grey, very low strength, highly weathered with extremely weathered clay bands, Briggely Shale		E/D	1.0		PID = <5		
					1.1				
51.3	1.8	Pit discontinued at 1.8m Excavator refusal on weathered siltstone		D	1.7				
					1.8				
50.5	2								
49.7	3								
48.9	4								

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, *Blind replicate 06092021DP1 collected from 0.1-0.2m, Push-tube sample taken at 0.5m

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

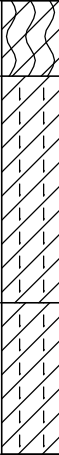
SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test $ls(50)$ (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test $ls(50)$ (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	> Water seep	S Standard penetration test	
E Environmental sample	≡ Water level	V Shear vane (kPa)	

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 57.4 AHD
EASTING: 296217.3
NORTHING: 6250969.3

PIT No: TP5
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
-67	0.25	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL, firm		E/D	0.1		PID = <5					
					0.2							
	1.0	Silty CLAY CI-CH: medium to high plasticity, orange, trace sub-angular siltstone gravel, w<PL, stiff, residual		E/D	0.5		PID = <5					
					0.6							
				B								
	1.5	Silty CLAY CI-CH: medium to high plasticity, pale grey, with angular siltstone gravel, w<PL, very stiff, residual (extremely weathered rock)		E/D	1.0		PID = <5					
					1.1							
	1.5	Below 1.4m: hard			1.4							
		Pit discontinued at 1.5m Excavator refusal on weathered siltstone		D	1.5							
-68	2.0											
-69	3.0											
-70	4.0											

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, CBR bulk sample 0.4-0.9m

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test $ls(50)$ (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test $ls(50)$ (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
				V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 60.5 AHD
EASTING: 296259.7
NORTHING: 6251024.7

PIT No: TP6
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
-80	0.3	FILL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, trace ash and charcoal, w<PL, very stiff		E/D	0.1		PID = <5		
					0.2				
	0.6	Silty CLAY CI-CH: medium to high plasticity, orange, w<PL, very stiff, residual		E/D	0.5		PID = <5		
					0.6				
-1	1.0	Silty CLAY CI-CH: medium to high plasticity, pale grey, with angular siltstone gravel, w<PL, very stiff to hard, residual (extremely weathered rock)		E/D	1.0		PID = <5	1	
					1.1				
-59	1.3	Pit discontinued at 1.3m Excavator refusal on weathered siltstone							
-2									2
-3									3
-4									4

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, *Blind replicate 06092021DP2 collected from 0.1-0.2m, Push-tube sample taken at 0.5m

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	> Water seep	S Standard penetration test	
E Environmental sample	≡ Water level	V Shear vane (kPa)	

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 83.1 AHD
EASTING: 296496.4
NORTHING: 6251000.2

PIT No: TP7
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
83.1	0.2	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL, firm		E/D	0.1		PID = <5		
		Silty CLAY CI-CH: medium to high plasticity, orange-yellow, trace angular siltstone gravel, w<PL, stiff to very stiff, residual		E/D	0.2				
				E/D	0.5		PID = <5		
				E/D	0.6				
	1.0	Silty CLAY CI-CH: medium to high plasticity, pale grey, with angular siltstone gravel, w<PL, very stiff to hard, residual (extremely weathered rock)		D	1.0				
				D	1.1				
82.1	1.5	Pit discontinued at 1.5m Excavator refusal on weathered siltstone		D	1.4				
				D	1.5				
81.1	2.0								
80.1	3.0								
79.1	4.0								

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 89.1 AHD
EASTING: 296584.6
NORTHING: 6250920.5

PIT No: TP8
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
89.1		TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL, firm		E/D	0.1		PID = <5		
				E/D	0.2				
	0.4	Silty CLAY CI-CH: medium to high plasticity, orange, trace sub-angular gravel, w<PL, stiff, residual (possible colluvium)		E/D	0.5		PID = <5		
	0.6	Silty CLAY CI-CH: medium to high plasticity, dark orange-yellow, w<PL, stiff to very stiff, residual		B	0.6				
	1.0			D	1.0				
	1.1			D	1.1				
	1.4			D	1.4				
	1.5			D	1.5				
	1.6	Pit discontinued at 1.6m Excavator refusal on weathered siltstone							
	2.0								
	3.0								
	4.0								

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPSCBR bulk sample 0.5-1.0m

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 93.3 AHD
EASTING: 296631.1
NORTHING: 6250940.9

PIT No: TP9
PROJECT No: 207450.00
DATE: 6/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
93 												

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: NB

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 93.3 AHD
EASTING: 296609.1
NORTHING: 6250919.6

PIT No: TP10
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
93.0	0.3	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
					0.2							
	0.8	Silty CLAY CI-CH: medium to high plasticity, brown, w<PL		E*	0.5		PID = <5					
					0.6							
1	0.8	Pit discontinued at 0.8m Target depth achieved										
2												
3												
4												

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, *Blind replicate BD1/20210907 collected from 0.5-0.6m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test $ls(50)$ (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test $ls(50)$ (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	> Water seep	S Standard penetration test	
E Environmental sample	≡ Water level	V Shear vane (kPa)	

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 67.9 AHD
EASTING: 296369.5
NORTHING: 6250953.3

PIT No: TP11
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
		Silty CLAY CI-CH: medium to high plasticity, red-brown, w<PL			0.2							
				E	0.5		PID = <5					
					0.6							
67.1	0.9	Pit discontinued at 0.9m Target depth achieved										
66.1	1											
65.1	2											
64.1	3											
63.1	4											
62.1												

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

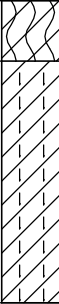
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test $ls(50)$ (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test $ls(50)$ (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	WL	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 67.7 AHD
EASTING: 296347.3
NORTHING: 6250981.1

PIT No: TP12
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
67	0.2	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
		Silty CLAY CI-CH: medium to high plasticity, red-brown mottled pale brown, w<PL			0.2							
		Below 0.4m: grading to pale brown mottled red		E*	0.5		PID = <5					
					0.6							
1	1.0	Pit discontinued at 1.0m Target depth achieved										
66												
2												
65												
3												
64												
4												
63												

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, *Blind replicate BD2/20210907 collected from 0.5-0.6m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	> Water seep	S Standard penetration test	
E Environmental sample	≡ Water level	V Shear vane (kPa)	

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 64.7 AHD
EASTING: 296317.9
NORTHING: 6250957.4

PIT No: TP13
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
		Silty CLAY CI-CH: medium to high plasticity, red-brown mottled pale brown, w<PL			0.2							
				E	0.5		PID = <5					
					0.6							
	0.8	Pit discontinued at 0.8m Target depth achieved										
1												
2												
3												
4												

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

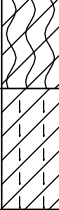
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test $ls(50)$ (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test $ls(50)$ (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	WL	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 63.4 AHD
EASTING: 296279.8
NORTHING: 6251056.2
DIP/AZIMUTH: 90°/--

BORE No: BH14
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
63.0	0.3	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5			
					0.2					
	0.7	Silty CLAY CI-CH: medium to high plasticity, red-brown mottled pale brown, w<PL		E	0.4		PID = <5			
					0.5					
0.7		Bore discontinued at 0.7m Auger refusal on stiff clay								
1.0										
1.5										
2.0										
2.5										
3.0										
3.5										
4.0										
4.5										
5.0										
5.5										
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62.0										
62.5										
63.0										

RIG: Hand tools **DRILLER:** JH **LOGGED:** JH **CASING:** No casing
TYPE OF BORING: Hand auger to 0.7 m.
WATER OBSERVATIONS: No free groundwater observed whilst drilling
REMARKS: Coordinates and levels obtained via differential GPS

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 60.7 AHD
EASTING: 296230.6
NORTHING: 6251061.3

PIT No: TP15
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

[illegible]

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _{seep}	Water seep
E	Environmental sample	W _{level}	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 55.4 AHD
EASTING: 296179.7
NORTHING: 6251055.7

PIT No: TP16
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

[illegible]

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, *Blind replicate BD4/20210907 collected from 0.5-0.6m.

☐ Sand Penetrometer AS1289.6.3.3

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 52.1 AHD
EASTING: 296116.7
NORTHING: 6250988.9

PIT No: TP17
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
51.8	0.2	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
		Silty CLAY CI-CH: medium to high plasticity, red-brown mottled pale brown, w<PL			0.2							
	0.7			E	0.5		PID = <5					
					0.6							
	0.7	Pit discontinued at 0.7m Target depth achieved										
	1											
	2											
	3											
	4											

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 53.3 AHD
EASTING: 296142.6
NORTHING: 6251083.2

PIT No: TP18
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
53.2	0.25	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
					0.2							
	0.8	Silty CLAY CI-CH: medium to high plasticity, red-brown mottled pale brown, w<PL		E*	0.5		PID = <5					
					0.6							
1	0.8	Pit discontinued at 0.8m Target depth achieved										
2												
3												
4												

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, *Blind replicate BD3/20210907 collected from 0.5-0.6m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	> Water seep	S Standard penetration test	
E Environmental sample	≡ Water level	V Shear vane (kPa)	

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 58.1 AHD
EASTING: 296219.9
NORTHING: 6251010.5

PIT No: TP19
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
58.1	0.3	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
					0.2							
	0.9	Silty CLAY CI-CH: medium to high plasticity, red-brown mottled grey, w<PL		E*	0.5		PID = <5					
					0.6							
1	0.9	Pit discontinued at 0.9m Target depth achieved							1			
2									2			
3									3			
4									4			

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS, *Blind replicate BD5/20210907 collected from 0.5-0.6m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test [s(50) (MPa)]
		PL(D)	Point load diametral test [s(50) (MPa)]
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 55.4 AHD
EASTING: 296176.7
NORTHING: 6251002.9

PIT No: TP20
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.3	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL		E	0.1		PID = <5					
				E	0.2							
		Silty CLAY CI-CH: medium to high plasticity, red-brown mottled pale grey, w<PL			0.5		PID = <5					
				E	0.6							
	0.9	Pit discontinued at 0.9m Target depth achieved										
	1											
	2											
	3											
	4											
	5											

RIG: 5-Tonne Excavator (600mm wide bucket)

LOGGED: JH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed whilst excavating

REMARKS: Coordinates and levels obtained via differential GPS

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: ESR Australia Pty Ltd
PROJECT: Proposed Industrial Development
LOCATION: 1050-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 63.7 AHD
EASTING: 296323.3
NORTHING: 6251053.5
DIP/AZIMUTH: 90°/--

BORE No: BH21
PROJECT No: 207450.00
DATE: 7/9/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.15	FILL/Silty CLAY: medium plasticity, brown, with ash, metal and wood fragments, trace rootlets, w<PL		E	0.0		PID = <5			
		SILTY CLAY CL: medium plasticity, brown, w<PL			0.1					
	0.4	Bore discontinued at 0.4m Auger refusal on stiff clay		E	0.3		PID = <5			
					0.4					
	1									
	2									
	3									
	4									

RIG: Hand tools **DRILLER:** JH **LOGGED:** JH **CASING:** No casing
TYPE OF BORING: Hand auger to 0.4 m.
WATER OBSERVATIONS: No free groundwater observed whilst drilling
REMARKS: Coordinates and levels obtained via differential GPS

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test $ls(50)$ (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test $ls(50)$ (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

Project:	Pre-Purchase Due Diligence Assessment	Project No.:	207450.01
Client:	ESR Australia Pty Ltd	Date:	Sep-21
Location:	1050-1064 Mamre Rd, Kemps Creek	Field Staff:	JH

Surface Sample Record

Sample ID	Location	PID (ppm)	Description
SS1	Western portion of the internal access road.	<5	FILL/Gravelly SAND: medium to coarse, brown, shale gravel, trace cement, brick and tile fragments, dry
SS2	Western centre of the internal access road.	<5	FILL/Gravelly SAND: medium to coarse, brown, shale gravel, trace cement, brick and tile fragments, dry
SS3	Eastern portion of the internal access road.	<5	FILL/Gravelly SAND: medium to coarse, brown, shale gravel, trace cement, brick and tile fragments, dry
SS4	Western paddock opposite Mamre Road.	<5	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL
SS5	Western paddock opposite Mamre Road.	<5	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL
SS6	Centre paddock.	<5	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL
SS7	Centre paddock.	<5	TOPSOIL/Silty CLAY CL: low to medium plasticity, dark brown, with organics and rootlets, w<PL
SS8	Centre paddock.	<5	FILL/Silty Clay: medium plasticity, dark brown, with organics and rootlets, trace sandstone cobbles and gravel, brick and tile fragments, W~PL
SS9	Centre paddock.	<5	FILL/Silty Clay: medium plasticity, dark brown, with organics and rootlets, trace sandstone cobbles and gravel, brick and tile fragments, W~PL
SS10	Internal access road, north of residential house.	<5	FILL/Gravelly SAND: medium to coarse, brown, shale gravel, trace cement, brick and tile fragments, dry
SS11	Eastern centre of the internal access road.	<5	FILL/Gravelly SAND: medium to coarse, brown, shale gravel, trace cement, brick and tile fragments, dry

Appendix D2

DP (2022a)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 58.9 AHD
EASTING: 296309
NORTHING: 6251198

PIT No: TP1
PROJECT No: 211619.00
DATE: 13/12/2021
SHEET 1 OF 1

[illegible]

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Free groundwater observed at 3.0m

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 61.7 AHD
EASTING: 296306
NORTHING: 6251094

PIT No: TP2
PROJECT No: 211619.00
DATE: 13/12/2021
SHEET 1 OF 1

[illegible]

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 56.5 AHD
EASTING: 296245
NORTHING: 6251152

PIT No: TP3
PROJECT No: 211619.00
DATE: 13/12/2021
SHEET 1 OF 1

[illegible]

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 53.6 AHD
EASTING: 296161
NORTHING: 6251173

PIT No: TP4
PROJECT No: 211619.00
DATE: 13/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
		CLAY CH: high plasticity, pale brown, w=PL, firm to stiff, residual (possibly alluvial)		A/E	0.0		PID<5ppm		
	0.4	CLAY CI: medium plasticity, pale grey brown, trace silt and ironstone gravel, w~PL, stiff, residual (possibly alluvial)		A/E	0.2		PID<5ppm		
	0.9	CLAY CL: low plasticity, pale brown, approximately 20% ironstone gravel and silt, w~PL, very stiff, residual (possibly alluvial)		A	0.4				
					0.5				
					0.9				
					1.0				
					1.4				
					1.5				
					1.9				
	2.0	Gravelly CLAY CL: low plasticity, brown, >30% ironstone gravel and silt, w>PL, hard, residual (possibly alluvial)		A	2.0				
		Below 2.5m: becoming wet							
					2.9				
	3.0	Pit discontinued at 3.0m		A	3.0				

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Free groundwater observed at 2.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.7 AHD
EASTING: 295946
NORTHING: 6251162

PIT No: TP5
PROJECT No: 211619.00
DATE: 13/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
47	0.2	TOPSOIL/Silty CLAY: low plasticity, grey, trace grass roots, w~PL, soft to firm		A/E	0.0		PID<5ppm					
		CLAY Cl: medium plasticity, orange/yellow brown, trace silt and ironstone gravel, w=PL, firm to stiff, residual (possibly alluvial)		A/E	0.2		PID<5ppm Bulk sample collected at 0.3-0.8m					
	0.75	CLAY Cl: medium plasticity, red brown, slightly silty, trace ironstone gravel, w<PL, stiff to very stiff, residual (possibly alluvial)			0.4							
					0.5							
				A	0.9							
					1.0							
	2			A	1.4							
					1.5							
				A	1.9							
					2.0							
46	2.5	CLAY Cl: medium plasticity, yellow brown, approximately 20% ironstone gravel, w<PL, apparently hard, residual (possibly alluvial)										
				A	2.9							
45	3.0	Pit discontinued at 3.0m		A	3.0							
44	4											
43												

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.4 AHD
EASTING: 295861
NORTHING: 6251228

PIT No: TP6
PROJECT No: 211619.00
DATE: 13/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
45 44 43 42 41	0.1	TOPSOIL/Silty CLAY: medium plasticity, pale grey, w<PL, firm		A/E*	0.0 0.1		PID<5ppm					
		CLAY CI: medium plasticity, orange brown, slightly silty, w~PL, stiff, residual (possibly alluvial)										
	0.5	CLAY CH: high plasticity, grey brown, w~PL, stiff, residual (possibly alluvial)		A/E	0.4 0.5		PID<5ppm					
	1			A	0.9 1.0							
	1.5	CLAY CH: high plasticity, mottled brown pale grey, w~PL, very stiff, residual		A	1.4 1.5							
	2			A	1.9 2.0							
3	3.0	Pit discontinued at 3.0m		A	2.9 3.0							

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Field replicate BD1/20211213 taken from 0.0-0.1m.

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 42.4 AHD
EASTING: 295717
NORTHING: 6251227

PIT No: TP7
PROJECT No: 211619.00
DATE: 13/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)				
				Type	Depth	Sample	Results & Comments						
42	0.15	TOPSOIL/Silty CLAY: low plasticity, grey, trace grass roots, w>PL, soft		A/E	0.0 0.1		PID<5ppm						
		CLAY CI: medium plasticity, pale grey brown, trace ironstone gravel, w~PL, stiff to very stiff, alluvial		A/E	0.4 0.5		PID<5ppm Bulk sample collected at 0.3-0.8m						
1				A	0.9 1.0								
	1.2	Silty CLAY CL: low plasticity, orange brown, w~PL, very stiff, alluvial											
				A	1.4 1.5								
2				A	1.9 2.0								

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Free groundwater observed at 2.5m

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 52.8 AHD
EASTING: 296124
NORTHING: 6251229

PIT No: TP8
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.0	TOPSOIL/Silty CLAY: low plasticity, grey, trace grass roots, w~PL, very soft		A/E	0.0		PID<5ppm					
	0.2	CLAY Cl: medium plasticity, yellow brown, trace ironstone gravel, w~PL, stiff, alluvial		A/E	0.2							
	0.4			A/E	0.4		PID<5ppm					
	0.5			A/E	0.5		pp = 300					
	0.7	Silty CLAY CL: low plasticity, orange brown, w~PL, stiff and very stiff, alluvial		U ₅₀	0.7							
	0.8			A	0.8							
	0.9			A	0.9							
	1.0			A	1.0							
	1.4			A	1.4							
	1.5			A	1.5							
	1.9			A	1.9							
	2.0	Silty CLAY CL: low plasticity, pale grey brown, trace ironstone, w~PL, very stiff to hard, alluvial		A	2.0							
	2.5	Below 2.5m: becoming soft and wet										
	2.9			A	2.9							
	3.0	Pit discontinued at 3.0m		A	3.0							

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Free groundwater observed at 2.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.1 AHD
EASTING: 295931
NORTHING: 6251295

PIT No: TP9
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
47.1	0.15	TOPSOIL/Silty CLAY: low plasticity, grey, trace grass roots, w~PL, soft		A/E*	0.0		PID<5ppm		
		Silty CLAY Cl: medium plasticity, orange brown, trace fine ironstone gravel, w~PL, stiff then very stiff, alluvial		A/E	0.1				
					0.4		PID<5ppm		
					0.5				
	0.9	Silty CLAY Cl: medium plasticity, pale grey brown, w<PL, very stiff to hard, alluvial		A	0.9				
46	1				1.0				
					1.4				
					1.5				
	2.0	CLAY CH: high plasticity, pale grey and brown, trace decomposed organic matter, w<PL, hard, lumpy, alluvial		A	1.9				
45	2				2.0				
	2.7	Pit discontinued at 2.7m on hard clay							
44	3								
	4								
43									

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Field replicate BD2/20211214 taken from 0.0-0.1m.

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 43.7 AHD
EASTING: 295775
NORTHING: 6251319

PIT No: TP10
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
43 1 42 2 41 3 40 4 39	0.0	Silty CLAY CL: low plasticity, pale grey brown, trace grass roots, w<PL, firm, alluvial		A/E	0.0		PID<5ppm		
	0.2				0.2				
	0.3	Silty CLAY CL: low plasticity, orange brown, trace fine ironstone gravel, w<PL, stiff to very stiff, alluvial		A/E	0.4		PID<5ppm		
	0.4				0.5				
	0.5			U ₅₀	0.75				
	0.8	CLAY CL: medium plasticity, mottled brown pale grey, trace silt, w~PL, very stiff, alluvial		A	0.9				
	1.0				1.0				
	1.4			A	1.4				
	1.5	CLAY CH: high plasticity, mottled brown and pale grey, w~PL, very stiff to hard, alluvial			1.5				
	1.9			A	1.9				
3 4 39	2.0				2.0				
	2.7			A	2.7				
	2.8	Pit discontinued at 2.8m			2.8				

RIG: 3.5T Excavator with 450mm bucket

LOGGED: SI

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 42.2 AHD
EASTING: 295719
NORTHING: 6251294

PIT No: TP11
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
39.2	0.1	TOPSOIL/Silty CLAY: low plasticity, grey, trace grass roots, w~PL		E	0.0		PID<5ppm					
					0.1							
		CLAY CI: medium plasticity, grey-brown, trace silt, decomposed organic matter, w~PL										
	0.5	Pit discontinued at 0.5m - Target depth reached		E	0.4		PID<5ppm					
					0.5							
1												
2												
3												
4												

RIG: 3.5T Excavator with 450mm bucket

LOGGED: VV/DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.0 AHD
EASTING: 295824
NORTHING: 6251297

PIT No: TP12
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46		FILL/CLAY: low plasticity, dark brown, with silt, trace grass roots and rootlets, w<PL, (possibly former topsoil)		E	0.0		PID<5ppm					
					0.1							
	0.4	FILL/Silty CLAY: low plasticity, brown, trace rootlets, w~PL, (possibly former topsoil)		E	0.4		PID<5ppm					
					0.5							
45	1											
					1.4		PID<5ppm					
				E	1.5							
44	2	Pit discontinued at 2.0m - Limit of excavation										
43	3											
42	4											

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.1 AHD
EASTING: 295831
NORTHING: 6251268

PIT No: TP13
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	0.3	FILL/CLAY: low plasticity, brown, with silt, trace grass roots and rootlets, w<PL, (possibly former topsoil)		E	0.0		PID<5ppm					
					0.1							
		FILL/Silty CLAY: low plasticity, light brown, trace rootlets and piece of cloth, w~PL, (possibly former topsoil)		E	0.4		PID<5ppm					
					0.5							
1				E	1.0		PID<5ppm	1				
					1.2							
2				E	2.0		PID<5ppm	2				
					2.2							
2.5		Pit discontinued at 2.5m - Limit of excavation										
3												
4												

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.8 AHD
EASTING: 295843
NORTHING: 6251273

PIT No: TP14
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	0.3	FILL/CLAY: low plasticity, dark brown, with silt, trace grass roots and rootlets, w~PL, (possibly former topsoil)		E	0.0		PID<5ppm					
					0.1							
		FILL/CLAY: low plasticity, dark grey clay, trace silt and rootlets, w~PL, (possibly former topsoil)		E	0.4		PID<5ppm					
					0.5							
45	1			E	1.4		PID<5ppm					
					1.5							
44	2	Pit discontinued at 2.0m - Limit of excavation										
43	3											
42	4											

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.4 AHD
EASTING: 295848
NORTHING: 6251274

PIT No: TP15
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46.5 1 45.5	0.3	FILL/Sandy CLAY: low plasticity, dark brown, fine to coarse sand, trace silt, grass roots, rootlets and shell fragments, w~PL		E	0.0		PID<5ppm					
					0.1							
		FILL/Clayey SAND: fine to coarse, brown, trace silt, rootlets and shell fragments, moist		E*	0.4		PID<5ppm					
					0.5							
				E	1.5		PID<5ppm					
					1.7							
2 44 3 43 4 42	2.0	Pit discontinued at 2.0m - Limit of excavation										

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile. *Field replicate BD3/20211214 taken from 0.4-0.5m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
				V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.7 AHD
EASTING: 295852
NORTHING: 6251185

PIT No: TP16
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
45	0.7	FILL/Clayey GRAVEL: medium to coarse shale and ironstone, grey mottled brown, trace shale cobbles and rootlets, dry		E	0.0		PID<5ppm					
					0.2							
				E	0.4		PID<5ppm					
					0.5							
				E	0.7		PID<5ppm					
1	1.0	CLAY Cl: medium plasticity, brown, trace ironstone gravel, w<PL, stiff to very stiff, residual, (possibly alluvial)		E	0.9							
		Pit discontinued at 1.0m - Target depth reached										
44												
2												
43												
3												
42												
4												
41												

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
				V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.5 AHD
EASTING: 295858
NORTHING: 6251205

PIT No: TP17
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

[illegible]

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.6 AHD
EASTING: 295867
NORTHING: 6251181

PIT No: TP18
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

[illegible]

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile. *Field replicate BD4/20211214 taken from 0.0-0.2m.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.8 AHD
EASTING: 295892
NORTHING: 6251140

PIT No: TP19
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
47 1		FILL/Silty CLAY: low plasticity, brown, trace grass roots and rootlets, w~PL, (possibly former topsoil)		E	0.0		PID<5ppm					
				0.2								
	E			0.7		PID<5ppm						
				0.9								
46 1.6		FILL/CLAY: low plasticity, grey, with silt, trace rootlets, w~PL, (possibly former topsoil)		E	1.7		PID<5ppm					
1.9		CLAY CL-CI: low to medium plasticity, brown, trace fine to medium ironstone gravel, w~PL, stiff to very stiff, residual (possibly alluvial)			1.9							
2 2.0				E	2.0		PID<5ppm	2				
2.2		Pit discontinued at 2.2m - Target depth reached			2.2							
45 3												
44 4												
43												

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	sp	Standard penetration test
E	Environmental sample	W	Water level	S	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.9 AHD
EASTING: 295942
NORTHING: 6251132

PIT No: TP20
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48 1 <												

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated into stockpile. *Field replicate BD5/20211214 taken from 1.0-1.2m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030 Mamre Road, Kemps Creek

SURFACE LEVEL: 55.2 AHD
EASTING: 296190
NORTHING: 6251199

PIT No: TP21
PROJECT No: 211619.00
DATE: 14/12/2021
SHEET 1 OF 1

[illegible]

RIG: 3.5T Excavator with 450mm bucket

LOGGED: DIH

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



Appendix D3

DP (2022b)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 44.4 AHD
EASTING: 295812
NORTHING: 6251300

PIT No: 101
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILL/ Silty CLAY: medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
				E	0.2							
		Silty CLAY: medium to high plasticity, red-brown, trace fine to medium gravel, w<PL, apparently firm, residual		E	0.3							
					0.6							
	0.7	Pit discontinued at 0.7m Target depth reached		E	0.7							
	1											
	2											
	3											
	4											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 44.4 AHD
EASTING: 295819
NORTHING: 6251272

PIT No: 102
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILL/ Silty CLAY: low to medium plasticity, dark brown, with rootlets, w~PL		E	0.1							
				E	0.2							
		Silty CLAY: medium to high plasticity, red-brown, with silt, trace fine to medium gravel, w~PL, apparently stiff, residual		E	0.3							
				E	0.6							
				E	0.7							
	0.8	Pit discontinued at 0.8m Target depth reached										
1												
4.3												
2												
4.2												
3												
4.1												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 44.4 AHD
EASTING: 295835
NORTHING: 6251232

PIT No: 103
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.1 AHD
EASTING: 295846
NORTHING: 6251217

PIT No: 104
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 44.9 AHD
EASTING: 295846
NORTHING: 6251178

PIT No: 105
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.1 AHD
EASTING: 295850
NORTHING: 6251156

PIT No: 106
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
45	0.2	FILL / Silty CLAY: medium plasticity, dark brown, with rootlets, w~PL		E	0.0								
			E	0.2									
				0.3									
	0.8		CLAY: medium to high plasticity, red-brown, trace fine to medium gravel, with silt, w<PL, apparently firm to stiff, residual (possibly alluvial)		E								
	0.8	Pit discontinued at 0.8m Target depth reached			0.8								
44	1								1				
43	2								2				
42	3								3				

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.2 AHD
EASTING: 295885
NORTHING: 6251156

PIT No: 107
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
47		FILL / Silty CLAY: low plasticity, dark brown, trace rootlets and fine to medium gravel, w~PL (possibly former topsoil)		E	0.0								
					0.2								
					0.5								
				E	0.7								
					1.0								
1	1.0	CLAY: medium to high plasticity, red-brown, trace fine to medium gravel, w<PL, apparently firm to stiff, residual		E	1.0								
46					1.2								
					1.5								
				E	1.7								
1.8	1.8	Pit discontinued at 1.8m Target depth reached											
2	2												
45													
3	3												
44													

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.8 AHD
EASTING: 295878
NORTHING: 6251176

PIT No: 108
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.4 AHD
EASTING: 295871
NORTHING: 6251198

PIT No: 109
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	0.7	FILL / Silty CLAY: low plasticity, dark brown, with rootlets, w>PL (possibly former topsoil)		E	0.0							
					0.2							
					0.5							
				E	0.7							
					0.9							
45	1.5	CLAY: medium to high plasticity, red-brown, trace rootlets and fine to medium gravel, w~PL, apparently stiff, residual		E	1.3							
					1.5							
				E	1.5							
44	Pit discontinued at 1.5m Target depth reached											
43												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	sp	Standard penetration test
E	Environmental sample	W _L	Water level	S	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.7 AHD
EASTING: 295846
NORTHING: 6251252

PIT No: 110
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	1	FILL / Silty CLAY: low plasticity, dark brown, trace rootlets, w~PL (possibly former topsoil)		E	0.0							
					0.2							
					0.5							
					0.7							
					1.0							
					1.2							
45	1.3	CLAY: medium to high plasticity, red-brown, with fine to medium gravel, w<PL, apparently stiff, residual		E	1.3							
					1.5							
					1.8							
					1.9							
44	2.0	Pit discontinued at 2.0m Target depth reached										
43	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.8 AHD
EASTING: 295861
NORTHING: 6251296

PIT No: 111
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	0.9	FILL / Sandy CLAY: low to medium plasticity, dark brown, with fine to medium sand, trace rootlets and timber, w~PL		E	0.0							
					0.2							
					0.5							
				E	0.7							
					0.9							
45	1	CLAY: medium to high plasticity, red-brown, with silt, w<PL, apparently stiff, residual		E	0.9							
					1.1							
					1.4							
				E	1.6							
45	1.8	Pit discontinued at 1.8m Target depth reached										
44	2											
43	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
				V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.1 AHD
EASTING: 295884
NORTHING: 6251295

PIT No: 112
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	0.25	FILL / Silty CLAY: low plasticity, dark brown, trace rootlets and fine to medium gravel, w>PL CLAY: medium to high plasticity, red-brown, with silt, trace fine to medium gravel, w~PL, apparently firm to stiff, residual		E	0.0							
					0.2							
				E	0.25							
					0.35							
					0.7							
45	1			E	0.9							
45	1.2	Pit discontinued at 1.2m Target depth reached										
44	2											
44												
43	3											
43												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

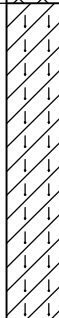
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.0 AHD
EASTING: 295879
NORTHING: 6251272

PIT No: 113
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per mm)																
				Type	Depth	Sample		Results & Comments	5	10	15	20												
46	0.3	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets and fine to medium gravel, w>PL		E	0.0																			
				0.2																				
		Silty CLAY: medium to high plasticity, red-brown, trace rootlets and fine to medium gravel, w~PL, apparently firm to stiff, residual		E	0.3																			
					0.5																			
					0.8																			
45	1			E	1.0			1																
44	2	Pit discontinued at 1.15m Target depth reached																						
43	3																							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.3 AHD
EASTING: 295881
NORTHING: 6251250

PIT No: 114
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD1/20220718 collected at 0.8-1.0m

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.8 AHD
EASTING: 295885
NORTHING: 6251221

PIT No: 115
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		CLAY: medium to high plasticity, red-brown mottled grey, trace rootlets and fine to medium gravel, w~PL, apparently stiff, residual		E	0.0							
					0.2							
					0.5							
				E	0.7							
	0.7	Pit discontinued at 0.7m Target depth reached										
45	1											
44	2											
43	3											
42												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.5 AHD
EASTING: 295893
NORTHING: 6251203

PIT No: 116
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL / Silty CLAY: low plasticity, dark brown, with fine to medium gravel, trace rootlets, w~PL		E	0.0							
				E	0.2							
	0.4	CLAY: medium to high plasticity, red-brown, trace silt and rootlets, w<PL, apparently firm to stiff, residual		E	0.4							
				E	0.6							
				E	0.9							
1	1.0	Pit discontinued at 1.0m Target depth reached		E	1.0							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.7 AHD
EASTING: 295902
NORTHING: 6251177

PIT No: 117
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.0 AHD
EASTING: 295919
NORTHING: 6251138

PIT No: 118
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty CLAY: low plasticity, dark brown, with rootlets, trace fine to medium gravel, w~PL (possibly former topsoil)		E	0.0							
					0.2							
					0.5							
				E	0.7							
					1.0							
47	1			E	1.2							
		CLAY: medium to high plasticity, red-brown, trace fine to medium gravel, w<PL, apparently firm to stiff, residual		E	1.5							
					1.7							
					2.0							
46	2			E	2.2							
	2.2	Pit discontinued at 2.2m Target depth reached										
45	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.4 AHD
EASTING: 295946
NORTHING: 6251150

PIT No: 119
PROJECT No: 211619.02
DATE: 18/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
47	0.2	FILL / Silty CLAY: low to medium to high plasticity, dark brown, trace fine to medium gravel, rootlets, terracotta, timber, tiles and concrete fragments, w~PL CLAY: medium to high plasticity, red-brown, trace fine to medium gravel, with silt, trace rootlets, w<PL, apparently firm to stiff, residual		E*	0.0							
				E	0.2							
					0.4							
				E	0.7							
					0.9							
1												
46												
	1.6	Pit discontinued at 1.6m Target depth reached										
2												
45												
3												
44												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD2/20220718 collected at 0-0.2m

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.1 AHD
EASTING: 295958
NORTHING: 6251173

PIT No: 120
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD1/20220719 collected at 0.3-0.4m

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.3 AHD
EASTING: 295957
NORTHING: 6251189

PIT No: 121
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48	0.3	FILL / Silty CLAY: medium to high plasticity, dark brown, trace rootlets, w~PL CLAY: high plasticity, red-brown, trace silt and rootlets, w>PL, apparently stiff, residual		E	0.1							
					0.2							
					0.3							
				E	0.4							
1	0.8			E	0.8							
					0.9							
1.1	1.1	Pit discontinued at 1.1m Target depth reached										
47												
2												
46												
3												
45												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.5 AHD
EASTING: 295974
NORTHING: 6251185

PIT No: 122
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.3	FILL / Silty CLAY: low plasticity, dark brown, trace rootlets and timber, w~PL		E	0.1							
					0.2							
				E*	0.3							
					0.4							
		CLAY: high plasticity, red-brown, trace rootlets, w>PL, apparently stiff, residual										
				E	0.8							
					0.9							
	1.2	Pit discontinued at 1.2m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD2/20220719 collected at 0.3-0.4m

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.6 AHD
EASTING: 295978
NORTHING: 6251169

PIT No: 123
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48	0.3	FILL / Silty CLAY: low to medium to high plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
					0.3							
		CLAY: high plasticity, red-brown, trace silt and rootlets, w>PL, apparently firm to stiff, residual		E	0.4							
					0.8							
					0.9							
1												
1.2		Pit discontinued at 1.2m Target depth reached										
47												
2												
46												
3												
45												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 49.1 AHD
EASTING: 295964
NORTHING: 6251131

PIT No: 124
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
49 48 47 46	0.0 0.1 0.2 0.4 0.5 0.9 1.0 1.4 1.5	FILL / Silty CLAY: low plasticity, dark brown, trace rootlets, w~PL (possibly former topsoil)		E	0.1							
					0.2							
					0.4							
					0.5							
					0.9							
					1.0							
					1.4							
					1.5							
					1.8							
					1.9							
1.8 2 47	1.8 1.9 2.3 2.4	Silty CLAY: medium to high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E*	1.8							
					1.9							
					2.3							
					2.4							
3 46	3.0	Pit discontinued at 3.0m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD3/20220719 collected at 1.8-1.9m. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 49.0 AHD
EASTING: 295964
NORTHING: 6251153

PIT No: 125
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
49		FILL / Silty CLAY: low plasticity, dark brown, with fine to medium gravel and brick fragments, trace rootlets, glass, plastic and ACM fragments, w~PL		E	0.1		Material samples ACM1 and ACM4					
					0.2							
				E	0.4							
					0.5							
				E	0.9							
48	1.0	CLAY: medium to high plasticity, red-brown, with silt, w~PL, apparently firm to stiff, residual		E	1.0			1				
					1.1							
				E	1.4							
					1.5							
47	2.0	Pit discontinued at 2.0m Target depth reached						2				
46	3							3				

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM = Asbestos containing material. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.6 AHD
EASTING: 295961
NORTHING: 6251152

PIT No: 125A
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty CLAY: low plasticity, dark brown, trace fine to medium gravel, rootlets, brick, hose, glass, plastic and ACM fragments, w~PL		E	0.5							
					0.6							
					0.8							
					0.9							
1	1.0	CLAY: medium to high plasticity, red-brown, with silt, w~PL, apparently firm to stiff, residual										
2	2.0	Pit discontinued at 2.0m Target depth reached										
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
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41												
42												
43												
44												
45												
46												
47												
48												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.5 AHD
EASTING: 295944
NORTHING: 6251159

PIT No: 126
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD4/20220719 collected at 1.0-1.1m. ACM = Asbestos containing material. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.3 AHD
EASTING: 295944
NORTHING: 6251155

PIT No: 126A
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, fine to medium gravel, bitumern, ash, brick, tile and plastic fragemnts, w~PL										
				E	0.5							
					0.6							
				E	0.8							
					0.9							
1	1.0	Silty CLAY: medium to high plasticity, red-brown, w~PL, apparently firm to stiff, residual (possibly alluvial)										
47												
	1.8	Pit discontinued at 1.8m Target depth reached										
2												
46												
3												
45												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.3 AHD
EASTING: 295933
NORTHING: 6251164

PIT No: 127
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.2 AHD
EASTING: 295929
NORTHING: 6251161

PIT No: 128
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48 47 1 1.1 47 1.9	0.1 0.2 0.4 0.5 1.0 1.1 1.2 1.6 1.7	FILL / Silty CLAY: low plasticity, dark brown, trace rootlets, fine to medium sand, fine to medium igneous gravel, plastic, glass, timber, wire, tile and ACM fragments, w~PL		E	0.1	Material sample ACM2						
					0.2							
				E	0.4							
					0.5							
				E	1.0							
				E	1.1							
					1.2							
				E	1.6							
					1.7							
2 46 3 45		Pit discontinued at 1.9m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM = Asbestos containing material. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

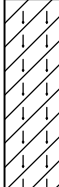
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.2 AHD
EASTING: 295891
NORTHING: 6251162

PIT No: 129
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
47		FILL / Silty CLAY: low plasticity, dark brown, trace rootlets, fine to medium gravel, timber, styrofoam and plastic fragments, w~PL			0.1								
				E	0.2								
					0.4								
				E	0.5								
1					0.9								
				E	1.0								
46		Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL apparently stiff, residual			1.4								
1.5				E	1.5								
				E*	1.6								
					1.9								
2	2.0	Pit discontinued at 2.0m Target depth reached		E	2.0								
45		Pit discontinued at 2.0m Target depth reached											
3													
44		Pit discontinued at 2.0m Target depth reached											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD5/20220719 collected at 1.5-1.6m. Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.9 AHD
EASTING: 295879
NORTHING: 6251189

PIT No: 130
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	1	FILL /Silty CLAY: low to medium plasticity, dark brown, trace rootlets, medium to fine gravel, styrofoam, plastic, glass, charcoal and clinker fragments, w~PL										
45	1.2	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual										
43	2											
42	2.1	Pit discontinued at 2.1m Target depth reached										
41	3											
40												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.1 AHD
EASTING: 295852
NORTHING: 6251280

PIT No: 131
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty SAND: fine to coarse, dark brown, with clay, trace fine to medium shale gravel, rootlets, shells, clinker, concrete and ACM fragments, moist		E	0.1							
					0.2							
				E	0.4							
					0.5							
1				E	0.9							
47					1.0							
				E	1.4		Material sample ACM6					
					1.5							
				E	1.9							
2					2.0							
46												
				E	2.4							
	2.5	FILL / Silty CLAY: low to medium plasticity, dark grey, with fine to medium gravel, w~PL		E	2.5							
					2.6							
3	3.0	CLAY: medium to high plasticity, red-brown, with silt, trace fine to medium gravel, w~PL, apparently firm to stiff, residual		E*	3.0							
45					3.1							
				E	3.4							
	3.5	Pit discontinued at 3.5m Target depth reached			3.5							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD6/20220719 collected at 3.0-3.1m. ACM = Asbestos containing material. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.9 AHD
EASTING: 295850
NORTHING: 6251281

PIT No: 131A
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
47.1	1	FILL / Silty SAND: fine to medium, dark brown, with silt, trace fine to medium shale gravel, rootlets, shells, clinker and concrete fragments, moist		E	0.4							
					0.5							
				E	1.4							
					1.5							
46.2	2	FILL / Silty CLAY: low to medium plasticity, dark grey, with fine to medium gravel, w~PL										
45.3	3	CLAY: medium to high plasticity, red-brown, with silt, trace fine to medium gravel, w~PL, apparently firm to stiff, residual										
44.4	3.5	Pit discontinued at 3.5m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.2 AHD
EASTING: 295853
NORTHING: 6251299

PIT No: 132
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
47		FILL / Silty CLAY: low plasticity, dark brown and red-brown, fine to coarse sand, trace fine to medium gravel, rootlets, shells, clinker, ash, timber and ACM fragments, w~PL		E	0.1							
					0.2							
				E	0.4							
					0.5							
1		CLAY: medium to high plasticity, red-brown, with silt, trace rootlets, w~PL, apparently stiff, residual		E	0.9		Material sample ACM7					
					1.0							
				E	1.4							
					1.5							
				E	1.7							
1.8					1.8							
				E	1.9							
2					2.0							
		Pit discontinued at 2.5m Target depth reached			2.4							
				E	2.5							
3												
44												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM = Asbestos containing material. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.1 AHD
EASTING: 295851
NORTHING: 6251299

PIT No: 132A
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
47		FILL / Silty Sandy CLAY: low plasticity, dark brown and red-brown, fine to coarse sand, trace fine to medium gravel, rootlets, shells, clinker, ash, timber and ACM fragments, w~PL											
				E	0.4 0.5								
1									1				
46													
				E	1.4 1.5								
1.8													
2		CLAY: medium to high plasticity, red-brown, with silt, trace rootlets, w~PL, apparently stiff, residual							2				
45													
2.5		Pit discontinued at 2.5m Target depth reached											
3									3				
44													

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM = Asbestos containing material. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.5 AHD
EASTING: 295832
NORTHING: 6251295

PIT No: 133
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty CLAY: low plasticity, dark brown, trace rootlets and fine to medium gravel, w~PL (possibly former tropsoil)		E	0.1							
					0.2							
				E	0.6							
					0.7							
1				E	1.2							
					1.3							
				E	1.9							
					2.0							
2				E	2.9							
					3.0							
				E	3.4							
3				E	3.4							
				E	3.4							
4				E	3.4							
				E	3.4							
5				E	3.4							
				E	3.4							
6				E	3.4							
				E	3.4							
7				E	3.4							
				E	3.4							
8				E	3.4							
				E	3.4							
9				E	3.4							
				E	3.4							
10				E	3.4							
				E	3.4							
11				E	3.4							
				E	3.4							
12				E	3.4							
				E	3.4							
13				E	3.4							
				E	3.4							
14				E	3.4							
				E	3.4							
15				E	3.4							
				E	3.4							
16				E	3.4							
				E	3.4							
17				E	3.4							
				E	3.4							
18				E	3.4							
				E	3.4							
19				E	3.4							
				E	3.4							
20				E	3.4							
				E	3.4							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 49.4 AHD
EASTING: 295836
NORTHING: 6251280

PIT No: 134
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL / Silty CLAY: low plasticity, dark brown, trace rootlets and fine to medium gravel, w~PL (possibly former tropsoil)		E	0.1							
				E	0.2							
				E	0.6							
				E	0.7							
				E	0.9							
				E	1.0							
				E	1.9							
				E	2.0							
				E	2.9							
				E	3.0							
		Below 3.0m: no rootlets		E	3.4							
		Pit discontinued at 3.5m Limit of excavator reach		E	3.5							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 49.3 AHD
EASTING: 295840
NORTHING: 6251262

PIT No: 135
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)					
				Type	Depth	Sample	Results & Comments		5	10	15	20		
		FILL / Silty CLAY: low plasticity, dark brown, trace rootlets, w~PL (possibly former topsoil)												
				E	0.1									
					0.2									
49														
				E	0.5									
					0.6									
1														
				E	1.0					1				
					1.1									
48														
			E*	1.5										
				1.6										
2									2					
47														
			E	2.5										
				2.6										
3									3					
46														
3.6		Pit discontinued at 3.6m Limit of excavator reach		E	3.5									
					3.6									

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD7/20220719 collected at 1.5-1.6m. Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.3 AHD
EASTING: 295861
NORTHING: 6251200

PIT No: 136
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.5 AHD
EASTING: 295868
NORTHING: 6251179

PIT No: 137
PROJECT No: 211619.02
DATE: 19/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty CLAY: low plasticity, dark brown, trace rootlets, w~PL (possibly former topsoil)		E	0.1							
					0.2							
				E	0.5							
					0.6							
	1			E	1.0			1				
					1.1							
	47			E	1.5							
					1.6							
	2			E	2.5			2				
					2.6							
46												
3								3				
45	3.5	Silty CLAY: medium to high plasticity, red-brown, w~PL, apparently firm to stiff, residual Pit discontinued at 3.6m Target depth reached		E	3.5							
	3.6				3.6							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

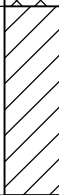
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.4 AHD
EASTING: 295843
NORTHING: 6251192

PIT No: 138
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)				
				Type	Depth	Sample	Results & Comments		5	10	15	20	
45		FILL / Silty CLAY: low to medium plasticity, dark brown, with rootlets, trace fine to medium sandstone gravel, brick, terracotta, tiles, shells and ACM fragments, w~PL			0.1								
				E	0.2								
				E	0.5								
					0.6								
1	1.0	CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently stiff, residual		E	0.9								
				E	1.0								
					1.1								
44		Pit discontinued at 1.5m Target depth reached			1.4								
	1.5			E	1.5								
		Pit discontinued at 1.5m Target depth reached											
2													
43		Pit discontinued at 1.5m Target depth reached											
3		Pit discontinued at 1.5m Target depth reached											
42		Pit discontinued at 1.5m Target depth reached											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM = Asbestos containing material. Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.5 AHD
EASTING: 295844
NORTHING: 6251190

PIT No: 138A
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
45		FILL / Silty CLAY: low to medium plasticity, dark brown, with rootlets, trace fine to medium sandstone gravel, shells, brick, terracotta, tile and ACM fragments, w~PL		E	0.7							
					0.8							
1	1.0	CLAY: medium to high plasticity, red-brown, trace silt and rootlets, w~PL, apparently firm to stiff, residual						1				
44	1.5	Pit discontinued at 1.5m Target depth reached										
2								2				
43												
3								3				
42												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: ACM = Asbestos containing material. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 53.3 AHD
EASTING: 296129
NORTHING: 6251082

PIT No: 139
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD1/20220720 collected at 1.4-1.5m. Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 54.3 AHD
EASTING: 296157
NORTHING: 6251078

PIT No: 140
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
54.4	0.3	FILL / Silty CLAY: low to medium plasticity, dark brown, with fine to medium gravel, trace rootlets and ash, w~PL		E	0.1							
					0.2							
					0.3							
				E	0.4							
	0.9	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual			0.8							
				E	0.9							
1		Pit discontinued at 0.9m Target depth reached										
2												
3												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 52.7 AHD
EASTING: 296134
NORTHING: 6251015

PIT No: 141
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
52.7	0.3	FILL / Silty CLAY: medium to high plasticity, dark brown, with fine to medium igneous and sandstone gravel, trace rootlets and fabric fragments, w~PL		E	0.1							
					0.2							
		Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.4							
					0.5							
	1			E	0.9							
					1.0							
49	1.2	Pit discontinued at 1.2m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

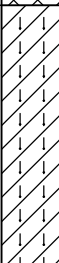
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W _s	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 54.3 AHD
EASTING: 296157
NORTHING: 6250988

PIT No: 142
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
54.3	0.3	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
					0.3							
		Silty CLAY: medium to high plasticity, red-brown, trace rootlets, w~PL, apparently stiff, residual		E	0.4							
					0.8							
1	1.0	Pit discontinued at 1.0m Target depth reached		E	0.9							
52	2											
50	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 54.2 AHD
EASTING: 296160
NORTHING: 6251017

PIT No: 143
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
-0.5 -0.4 -0.3 -0.2 -0.1	0.1	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
	0.4	Silty CLAY: medium to high plasticity, red-brown, trace rootlets, w~PL, apparently stiff, residual		E	0.4							
					0.5							
	1.0	Pit discontinued at 1.0m Target depth reached		E	0.9							
-1.0 -1.5 -2.0 -2.5 -3.0	1.0	Pit discontinued at 1.0m Target depth reached		E	1.0							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PLD	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 55.4 AHD
EASTING: 296176
NORTHING: 6251073

PIT No: 144
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.3	FILL / Silty CLAY: medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
					0.3							
		CLAY: medium to high plasticity, red-brown, with silt, trace rootlets, w~PL, apparently stiff, residual		E*	0.4							
					0.8							
				E	0.9							
	1.1	Pit discontinued at 1.1m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD2/20220720 collected at 0.3-0.4m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 56.8 AHD
EASTING: 296204
NORTHING: 6251040

PIT No: 145
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.3	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
					0.3							
				E	0.4							
	0.9	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently stiff, residual			0.8							
				E	0.9							
	1.0	Pit discontinued at 0.9m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	sp	Standard penetration test
E	Environmental sample	W	Water level	S	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 56.8 AHD
EASTING: 296198
NORTHING: 6250992

PIT No: 146
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.3	FILL / Silty CLAY: medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
					0.3							
				E	0.4							
		Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently stiff, residual										
				E	0.8							
					0.9							
	1.1	Pit discontinued at 1.1m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 59.7 AHD
EASTING: 296247
NORTHING: 6251002

PIT No: 147
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
				E	0.2							
		Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.3							
	0.8				0.7							
				E	0.8							
	0.8	Pit discontinued at 0.8m Target depth reached										
1												
2												
3												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 59.3 AHD
EASTING: 296242
NORTHING: 6251044

PIT No: 148
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
59.3	0.2	FILL / Silty CLAY: high plasticity, dark brown, trace rootlets and fine to medium gravel, w~PL		E	0.1							
					0.2							
	0.4	CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently stiff, residual		E	0.3							
					0.4							
					0.8							
				E	0.9							
1	1.0	Pit discontinued at 1.0m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 50.2 AHD
EASTING: 296029
NORTHING: 6251255

PIT No: 149
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48	0.3	FILL / Silty SAND: fine to medium, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
		FILL / Silty CLAY: medium plasticity, dark brown, trace rootlets and fine to medium gravel, w~PL		E	0.4							
					0.5							
	1.0	Silty CLAY: high plasticity, red-brown, w~PL, apparently stiff, residual		E	0.9							
					1.0							
49				E	1.1							
					1.5							
49	1.6	Pit discontinued at 1.6m Target depth reached		E	1.6							
2												
48												
3												
47												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 60.4 AHD
EASTING: 296262
NORTHING: 6251060

PIT No: 150
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.3	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
					0.3							
		CLAY: high plasticity, red-brown, with silt, trace rootlets, w~PL, apparently stiff, residual		E	0.4							
					0.8							
				E	0.9							
	1.1	Pit discontinued at 1.1m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 62.2 AHD
EASTING: 296287
NORTHING: 6251040

PIT No: 151
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
63	0.3	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
		Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.3							
					0.4							
	1.0	Below 0.7m: red-brown mottled grey		E	0.8							
					0.9							
61	1.0	Pit discontinued at 1.0m Target depth reached										
60												
59												
58												
57												
56												
55												
54												
53												
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9												
8												
7												
6												
5												
4												
3												
2												
1												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 62.9 AHD
EASTING: 296293
NORTHING: 6251025

PIT No: 152
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 61.1 AHD
EASTING: 296269
NORTHING: 6251010

PIT No: 153
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
61.0	0.1	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
	0.4	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.4							
					0.5							
	0.8			E	0.8							
					0.9							
60.0	1.0	Pit discontinued at 1.0m Target depth reached										
59.0	2.0											
58.0	3.0											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 60.1 AHD
EASTING: 296266
NORTHING: 6250981

PIT No: 154
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 60.3 AHD
EASTING: 296280
NORTHING: 6250965

PIT No: 155
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
60.0	0.1	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
	0.4	CLAY: high plasticity, red-brown, with silt, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.4							
					0.5							
	0.9				0.9							
1	1.0	Pit discontinued at 1.0m Target depth reached		E	1.0							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 61.2 AHD
EASTING: 296298
NORTHING: 6250963

PIT No: 156
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 63.5 AHD
EASTING: 296315
NORTHING: 6250988

PIT No: 157
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
63.5	0.4	FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
	0.5	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.4							
					0.5							
	1.0	Pit discontinued at 1.0m Target depth reached		E	0.9							
1	1.0	Pit discontinued at 1.0m Target depth reached			1.0							
62												
2												
61												
3												
60												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 64.5 AHD
EASTING: 296320
NORTHING: 6251012

PIT No: 158
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 64.8 AHD
EASTING: 296322
NORTHING: 6251028

PIT No: 159
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL / Silty CLAY: low to medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
	0.4	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.4							
					0.5							
				E	0.9							
					1.0							
1	1.0	Pit discontinued at 1.0m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 64.7 AHD
EASTING: 296324
NORTHING: 6251044

PIT No: 160
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Material Sample ACM8 collected from surface

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 64.0 AHD
EASTING: 296316
NORTHING: 6251050

PIT No: 161
PROJECT No: 211619.02
DATE: 20/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
64.0	0.2	FILL / Silty CLAY: low to medium plasticity, dark brown, trace fine to medium gravel, rootlets, tile, concrete and plastic fragments, w~PL		E	0.1							
					0.2							
	0.2	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently stiff, residual		E	0.3							
					0.4							
					0.8							
					0.9							
63.0	1.0	Pit discontinued at 1.0m Target depth reached										
62.0	2.0											
61.0	3.0											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 62.8 AHD
EASTING: 296303
NORTHING: 6251058

PIT No: 162
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILL / Silty Gravelly CLAY: low plasticity, dark brown, fine to medium gravel, trace rootlets, w~PL		E	0.1							
				E	0.2							
		Silty CLAY: medium to high plasticity, red-brown, trace fine to medium gravel, w~PL, apparently firm to stiff, residual		E	0.3							
				E	0.6							
	0.7	Pit discontinued at 0.7m Target depth reached		E	0.7							
	1											
	2											
	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 57.2 AHD
EASTING: 296206
NORTHING: 6251082

PIT No: 163
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
57.0	0.3	FILL / Silty Gravelly CLAY: medium plasticity, dark brown, fine to medium gravel, trace sand and rootlets, w~PL		E	0.1							
					0.2							
					0.3							
		Silty CLAY: medium to high plasticity, red-brown, trace fine to medium gravel, w~PL, apparently firm to stiff, residual		E	0.4							
					0.8							
56.0	1.0	Pit discontinued at 1.0m Target depth reached		E	0.9							
55.0	2.0											
54.0	3.0											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 51.0 AHD
EASTING: 296090
NORTHING: 6251101

PIT No: 164
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
51	0.3	FILL / Silty CLAY: medium to high plasticity, dark brown, with fine to medium gravel, fine to coarse sand, trace rootlets, tile, plastic and wire fragments, w~PL		E	0.1							
					0.2							
				E	0.3							
	0.9	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual			0.4							
				E	0.8							
50	0.9	Pit discontinued at 0.9m Target depth reached			0.9							
	1											
	2											
49	2											
48	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W _s	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 46.3 AHD
EASTING: 295898
NORTHING: 6251133

PIT No: 165
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
46	0.3	FILL / Silty Sandy CLAY: low plasticity, dark brown, with fine to medium gravel and fine to coarse sand, trace rootlets, tile, plastic and wire fragments, w~PL		E	0.1							
					0.2							
				E	0.3							
					0.4							
	0.9	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.8							
		Pit discontinued at 0.9m Target depth reached			0.9							
1												
45												
2												
44												
3												
43												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 43.3 AHD
EASTING: 295762
NORTHING: 6251156

PIT No: 166
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
43.3	0.1	FILL / Gravelly SAND: fine to medium, dark grey, fine to medium gravel, moist		E	0.0							
					0.1							
		FILL / SAND: fine to coarse, yellow-brown, with crushed sandstone and fine to medium sandstone gravel, moist		E	0.2							
	0.3				0.3							
		FILL / Silty CLAY: medium plasticity, dark brown, trace fine to medium gravel, w~PL		E	0.4							
					0.5							
43.2	0.5			E	0.6							
		Silty CLAY: high plasticity, red-brown, w~PL, apparently firm to stiff, residual										
43.1	1.0			E	1.0							
	1.1				1.1							
43.0												
	1.7	Pit discontinued at 1.7m Target depth reached										
	2.0											
42.1												
	3.0											
41.0												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 63.0 AHD
EASTING: 296282
NORTHING: 6250996
DIP/AZIMUTH: 90°/--

BORE No: 167
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
88-1		CONCRETE								
	0.2	FILL / Silty CLAY: low to medium plasticity, dark brown, trace fine to medium gravel, w~PL		E	0.2					
	0.3				0.3					
	0.7			E	0.7					
	0.8				0.8					
	0.9	Silty CLAY: high plasticity, red-brown, w~PL, apparently firm to stiff, residual (possibly alluvial)		E*	0.9					
	1.0				1.0					
	1.4			E	1.4					
	1.5				1.5					
		Bore discontinued at 1.5m Target depth reached								

RIG: Handtools

DRILLER: PJ

LOGGED: PJ

CASING: Nil

TYPE OF BORING: Dia-core to 0.2m, hand auger to 1.5m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56. *Blind replicate BD1/20220721 collected from 0.9-1.0m.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 63.0 AHD
EASTING: 296287
NORTHING: 6250993
DIP/AZIMUTH: 90°/--

BORE No: 168
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
88		CONCRETE								
	0.2	FILL / Silty CLAY: medium plasticity, dark brown, w~PL								
				E	0.2					
					0.3					
	1.1	Silty CLAY: high plasticity, red-brown, w~PL, apparently firm to stiff, residual		E	0.7					
					0.8					
	1.8	Bore discontinued at 1.8m Target depth reached		E	1.1					
					1.2					
E				1.6						
				1.7						
61	2									
60	3									

RIG: Handtools

DRILLER: PJ

LOGGED: PJ

CASING: Nil

TYPE OF BORING: Dia-core to 0.2m, hand auger to 1.8m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 64.0 AHD
EASTING: 296281
NORTHING: 6250988
DIP/AZIMUTH: 90°/--

BORE No: 169
PROJECT No: 211619.02
DATE: 21/7/2022
SHEET 1 OF 1

[illegible]

RIG: Handtools

DRILLER: PJ

LOGGED: PJ

CASING: Nil

TYPE OF BORING: Dia-core to 0.2m, hand auger to 1.8m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

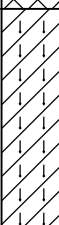


TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 43.5 AHD
EASTING: 295723
NORTHING: 6251239

PIT No: 170
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
43		FILL / Sandy GRAVEL: fine to coarse, grey, sand fine to coarse, with concrete, trace metal, wire, plastic and styrofoam		E	0.1							
					0.2							
				E	0.6							
					0.7							
				E	1.1							
					1.2							
42		Silty CLAY: medium to high plasticity, red-brown, trace rootlets, w>PL, apparently stiff, residual (possibly alluvial)		E*	1.3							
					1.4							
				E	1.7							
					1.8							
2		Pit discontinued at 1.8m Target depth reached										
41												
3												
40												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD1/20220727 collected from 1.3-1.4m. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 45.2 AHD
EASTING: 295834
NORTHING: 6251195

PIT No: 171
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
45.0 44.5 44.0 43.5 43.0 42.5 42.0 41.5	0.5	FILL / Sandy GRAVEL: fine to coarse, grey, sand fine to coarse, with concrete fragments, trace metal, wire and plastic fragments, moist		E	0.1							
					0.2							
				E	0.4							
					0.5							
		CLAY: medium to high plasticity, red-brown, with silt, trace rootlets, w>PL, apparently stiff, residual		E	0.6							
					0.7							
				E	1.1							
					1.2							
41.0 40.5 40.0 39.5 39.0 38.5 38.0 37.5 37.0 36.5	1.5	Pit discontinued at 1.5m Target depth reached										

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.0 AHD
EASTING: 295918
NORTHING: 6251147

PIT No: 172
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

[illegible]

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.8 AHD
EASTING: 295934
NORTHING: 6251145

PIT No: 173
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
47	0.9	FILL / Silty CLAY: low plasticity, dark brown, with fine to coarse gravel, sandstone blocks, concrete slabs and igneous blocks, trace rootlets, metal, plastic and wire fragments, w~PL		E	0.1							
					0.2							
					0.6							
					0.7							
1	1.1	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	1.1							
					1.2							
1.4	Pit discontinued at 1.4m Target depth reached											
2												
3												
4												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.0 AHD
EASTING: 295946
NORTHING: 6251143

PIT No: 174
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty CLAY: low plasticity, dark brown, with fine to coarse gravel, sandstone blocks, concrete slabs and igneous blocks, trace rootlets, tyre, metal, plastic and wire fragments, w~PL		E	0.1							
					0.2							
				E*	0.6							
					0.7							
47	0.9	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	1.1							
1					1.2							
	1.6	Pit discontinued at 1.6m Target depth reached										
46	2											
45	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD2/20220727 collected from 0.6-0.7m. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.3 AHD
EASTING: 295959
NORTHING: 6251141

PIT No: 175
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48		FILL / Silty CLAY: low plasticity, dark brown, with fine to coarse gravel, sandstone blocks, concrete slabs and igneous blocks, trace rootlets, metal, plastic and wire, w~PL		E	0.1							
					0.2							
				E	0.6							
					0.7							
1	1.0	Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	1.1							
47					1.2							
	1.6	Pit discontinued at 1.6m Target depth reached										
2												
46												
3												
45												

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 48.8 AHD
EASTING: 295970
NORTHING: 6251138

PIT No: 176
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
48	0.9	FILL / Silty CLAY: medium plasticity, dark brown, with fine to coarse gravel, sandstone blocks, concrete slabs and igneous blocks, trace rootlets, metal, plastic and wire fragments, w~PL		E	0.1							
					0.2							
				E	0.6							
					0.7							
				E*	1.1							
					1.2							
47	1.5	Pit discontinued at 1.5m Target depth reached										
46	2											
45	3											

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Blind replicate BD3/20220727 collected from 1.1-1.2m. Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: ESR Australia
PROJECT: Proposed Industrial Development
LOCATION: 1030-1064 Mamre Road, Kemps Creek

SURFACE LEVEL: 47.6 AHD
EASTING: 295931
NORTHING: 6251187

PIT No: 177
PROJECT No: 211619.02
DATE: 27/7/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
47	0.3	FILL / Silty CLAY: medium plasticity, dark brown, trace rootlets, w~PL		E	0.1							
					0.2							
		Silty CLAY: high plasticity, red-brown, trace rootlets, w~PL, apparently firm to stiff, residual		E	0.4							
					0.5							
					0.9							
1	1.0	Pit discontinued at 1.0m Target depth reached		E	1.0							

RIG: 8T Excavator (KX080-3) 600mm Toothed Bucket

LOGGED: PJ

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)



Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:
4,6,7
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:
15, 30/40 mm

Sampling Methods

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.



Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 - 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 - 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)

- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)

- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;

- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
Soil tends to stick together.
Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w < PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL' (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w > PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈ LL' (i.e. near the liquid limit).
- 'Wet' or 'w > LL' (i.e. wet of the liquid limit).



Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $IS_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $IS_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* Assumes a ratio of 20:1 for UCS to $IS_{(50)}$. It should be noted that the UCS to $IS_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Residual Soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	No signs of decomposition or staining.
<i>Note: If HW and MW cannot be differentiated use DW (see below)</i>		
Distinctly weathered	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.

Rock Descriptions

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

Douglas Partners



Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U ₅₀	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General



Asphalt



Road base



Concrete



Filling

Soils



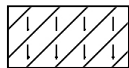
Topsoil



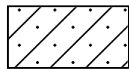
Peat



Clay



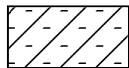
Silty clay



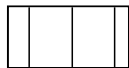
Sandy clay



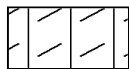
Gravelly clay



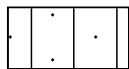
Shaly clay



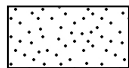
Silt



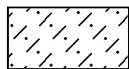
Clayey silt



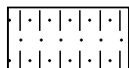
Sandy silt



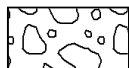
Sand



Clayey sand



Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

Sedimentary Rocks



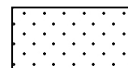
Boulder conglomerate



Conglomerate



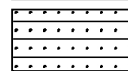
Conglomeratic sandstone



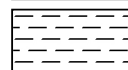
Sandstone



Siltstone



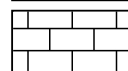
Laminite



Mudstone, claystone, shale

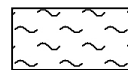


Coal

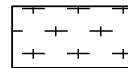


Limestone

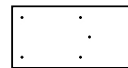
Metamorphic Rocks



Slate, phyllite, schist

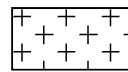


Gneiss

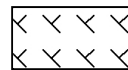


Quartzite

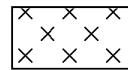
Igneous Rocks



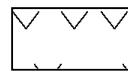
Granite



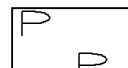
Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry

Appendix E

Remediation Options Assessment and Evaluation

Appendix E

Remediation Options Assessment and Evaluation

Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek

E1.0 Introduction

The following key guidelines and technical reports were consulted in the preparation of this remediation options assessment:

- NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM] (NEPC, 2013); and
- CRC CARE Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment (CRC CARE, 2019a).

The first stage of developing a remediation strategy is to establish clear and measurable remediation objectives and remediation criteria (clean-up levels). These will form the requirements against which remediation options are assessed.

The next stage of the remediation options assessment is to select technology and management options, or combinations of options, that have the potential to reduce contaminant concentrations and / or apply management controls as necessary so that the remediation objectives are achieved, and no unacceptable risk is posed by the contamination in the context of the current and proposed site use. Where several viable options have been identified, an assessment of each of the options will be required to determine which option will most adequately and sustainably meet the remediation objectives (CRC CARE, 2019a).

The remediation objectives are to:

- Address potentially unacceptable risks to relevant environmental values from contamination (refer to the CSM in Section 7); and
- Render the site suitable, from a contamination perspective, for the proposed industrial warehouse development (refer to Section 2).

It was also ESR's preferred option for the development to avoid, where possible and practical, the requirement for a long-term environmental management plan.

E2.0 Hierarchy of Remediation Options

NEPC (2013) stipulates the preferred hierarchy of options for site clean-up (remediation) and/or management which is outlined as follows:

- On-site treatment of the contamination so that it is destroyed, or the associated risk is reduced to an acceptable level; and

- Off-site treatment of excavated soil, so that the contamination is destroyed, or the associated risk is reduced to an acceptable level, after which soil is returned to the site;

or, if these two options are not practicable;

- Consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;

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.

When deciding which option to choose, the sustainability (namely environmental and economic) of each option should be considered, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option. 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 (NEPC, 2013).

E3.0 Remediation Options Assessment

E3.1 Introduction

The following issues have been identified at the site which require remediation:

- Copper and asbestos (non-friable) impacted fill;
- Total recoverable hydrocarbons (TRH) and asbestos (non-friable) impacted fill;
- Zinc impacted fill;
- Asbestos (non-friable) impacted fill; and
- Asbestos (friable) impacted fill.

E3.2 Remediation Options

Given the straightforward nature of the contamination issues at the site and the necessary earthworks (final landform) as part of the proposed development, only three options for the soil contamination have been considered, as follows:

- No action;
- Retention of asbestos containing material that are at concentrations below the remediation acceptance criteria (RAC) and placement of this material at depth as part of site's general management;
- On-site treatment;

- Placement of material which is above the RAC and unsuitable from an ecological perspective at depth (i.e., below 2 m of the final surface levels for the proposed development) and above the groundwater table. Note: preference is to not locate this within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services) where feasible;
- Consolidation and isolation of the soil by on-site containment (physical barrier systems) within a properly designed barrier (capping); and
- Excavation and offsite disposal.

The following key guidelines have therefore been consulted:

- CRC CARE *Technology Guide: Soil - Excavation* (CRC CARE, 2019b);
- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013);
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020);
- WA DoH *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (WA DoH, 2021); and
- WorkCover NSW *Managing Asbestos in or on Soil* (WorkCover NSW, 2014).

E3.2.1 No Action

No action means that no response is considered necessary to remediate the site as there is not considered to be a risk to the environment or the community from the contamination identified. Or in the instance that the remedial action itself would result in a greater net-environmental harm compared to not remediating the site. Given the exceedances of the RAC recorded during previous investigations, this is not considered to be a suitable approach.

E3.2.2 Further Assessment of Asbestos Impacted Material for Possible Retention On-Site

Further assessment stockpiles known to contain bonded asbestos containing material (ACM) to determine potential suitability to be retained onsite with unrestricted re-use at the site. This is determined if meeting human health screening levels dictated by the RAC for a site. This is considered a viable remedial option. To assist site management during and post construction it is recommended this material still be placed at depth (i.e., below 2 m of the final surface levels for the proposed development), above the groundwater table, and not located within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services).

E3.2.3 On-Site Treatment

The soil forming SP8 and SP10 could be subject to ex-situ treatment (e.g., direct thermal desorption for metals) whilst the TRH contamination in the vicinity of TP160 could be subject to land farming. Given that the contamination is not likely to comprise a significant volume of impacted soil, direct thermal desorption, involving the construction of a mobile direct thermal desorption plant, will be impractical and cost prohibitive compared to other options. Moreover, asbestos impacts have been encountered in SP10 and at TP160 and hence the aforementioned treatment is further complicated by this secondary contaminant. On-site treatment involving contaminant destruction is not possible for asbestos. This option is therefore not considered to be a suitable remediation approach for the site.

E3.2.4 Burial of Material Unsuitable from an Ecological Perspective at Depth

The soil at SP8 (zinc) and SP10 (copper) could be placed at a depth of at least 2 m below final design level and above the groundwater table. Preferably this material should also be located not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services). This would reduce the risk to ecological receptors and given the small volume of material and the proposed significant filling required in some areas of the site (i.e., potentially in order of several meters) is considered a suitable remediation approach for the ecological exceedances recorded in SP8 and SP10.

E3.2.5 Physical Barrier Systems

Physical barrier systems limit access to the impacted soil, mitigate surface water infiltration through the underlying material (where necessary) and control or reduce migration of the contaminants into the surrounding environment (where necessary). This option can include creating barriers around and / or on top of the impacted soil, or relocating the contaminants on-site to an engineered containment cell. In addition, the physical barrier can also be used to control the emission of odours or volatiles (if present) and to reduce erosion, infiltration and improve site aesthetics.

Physical barrier layers can include clean fill, low permeability soils such as clays, synthetic membranes such as high density polyethylene (HDPE), geotextile fabrics, bituminous materials, paving or concrete. Appropriate site grading and drainage systems may also be required to remove water from the capped areas (pavements and slabs) and to control surface run-off. Concrete barriers, bituminous pavements and various membranes may be vulnerable to cracking or shearing, depending on their proposed use, loading and exposure but these cracks or ruptures can be repaired providing appropriate inspection and maintenance is conducted as necessary.

Whilst a burial and capping barrier system approach would be suitable to remediate the contaminated soils that exceed the RAC, this would also result in the need for a long-term management plan to be implemented for the site. Given ESR's preference is to avoid the need for a plan and the small volume of material exceeding the human health and management RAC, this is not currently considered a preferred option.

E3.2.6 Removal to Landfill

Removal to landfill involves physically excavating and moving impacted soil to an off-site location for storage, treatment or disposal. Disposal to landfill may require prior treatment of the impacted soil to reduce the waste category from, for example, Hazardous Waste, to General Solid Waste (if possible), if the chemical levels exceed landfill criteria as defined in the *Waste Classification Guidelines* (NSW EPA, 2014).

This option would be particularly sustainable in the event that excavation was proposed which would, in any case, require removal of the surplus waste soils as part of the site formation process. This would be suitable for metals, TRH and asbestos.

However, given the project is not requiring export of material, this is not considered a sustainable approach for all contaminated soils (including those with concentrations below the HIL/HSL outlined in the RAC). Given this and the small volume of material identified exceeding the human health and management RAC, this remediation option is currently considered suitable for the soils exceeding the RAC in SP6, SP9, SP12 and around TP160 (i.e., Remediation Areas 3, 5, 8 and 9).

E4.0 Summary of Preferred Remediation Strategy

Based on the outcome of the options assessment, the preferred remediation strategy for the remediation areas are:

- Remediation Areas 1, 2, 6 and 7: Further assessment to determine if concentrations of asbestos containing material in the stockpiles are within the RAC and deemed to be suitable to be retained on site;
- Remediation Areas 3, 5 and 8: Excavation and offsite disposal to a suitably licenced waste facility; and
- Remediation Area 4: Consolidation of all assessed material deemed suitable to be retained on site (including Remediation Area 4 (SP8)) and placement of material at a depth of at least 2 m below final design level and above the groundwater table. Preferably this material is also be located not within landscaped areas or areas likely to be subject to disturbance in the future (e.g., areas of inground services) where feasible; and
- Remediation Area 9: Delineation of the asbestos and TRH impacted fill surrounding TP160, excavation and off-site disposal to a suitably licenced waste facility.

E5.0 References

CRC CARE. (2019a). *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019b). *Technology Guide: Soil - Excavation*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019c). *Technology Guide: Soil - Containment*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

WA DoH. (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. WA Department of Health.

WorkCover NSW. (2014). *Managing Asbestos in or on Soil*. March 2014: WorkCover NSW, NSW Government.

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Appendix F

Remediation Acceptance Criteria

Appendix F

Remediation Acceptance Criteria

Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek

F1.0 Remediation Acceptance Criteria

For any materials being imported onto site or areas requiring further validation (e.g., unexpected finds), laboratory results are to be compared to NEPC (2013)¹ health and ecological screening / investigation levels. Table F1 provides a summary of the levels derived in DP (2022b). Reference to DP (2022b) and NEPC (2013) should be undertaken for greater information on how these levels have been generated.

Table F1: Health and Environmental Screening Levels (mg/kg)

Contaminants		HIL-D & HSL-D Direct Contact	HSL-D Vapour Intrusion	EIL/ESL	VENM - ANZECC 1992/LRL (mg/kg)
Metals	Arsenic	3000	-	160	0.2-30
	Cadmium	900	-	-	0.04-2
	Chromium (VI)	3600	-	1200	0.5-110
	Copper	240,000	-	320	1-190
	Lead	1500	-	1800	2-200
	Mercury (inorganic)	730	-	-	0.001-0.1
	Nickel	6000	-	350	2-400
	Zinc	400,000	-	900	2-180
PAH	Benzo(a)pyrene TEQ ¹	40	-	172	-
	Naphthalene	11,000 (HSL)	NL	370	-
	Total PAH	4000	-	-	0.95-5
TRH	C6 – C10 (less BTEX) [F1]	800 [#]	310	215	<25 (LRL)
	>C10-C16 (less Naphthalene) [F2]	1000 [#]	NL	170	<50 (LRL)
	>C16-C34 [F3]	5000 [#]	-	2500	<100 (LRL)
	>C34-C40 [F4]	38,000 (HSL)	-	6600	<100 (LRL)
BTEX	Benzene	430 (HSL)	4	95	0.05-1
	Toluene	99,000 (HSL)	NL	135	0.1-1
	Ethylbenzene	27,000 (HSL)	NL	185	<1 (LRL)
	Xylenes	81,000 (HSL)	NL	95	<1 (LRL)
Phenol	Pentachlorophenol (used as an initial screen)	660	-	-	0.03-0.5/LRL

¹ NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) (NEPC, 2013).

Contaminants		HIL-D & HSL-D Direct Contact	HSL-D Vapour Intrusion	EIL/ESL	VENM - ANZECC 1992/LRL (mg/kg)
OCP	Aldrin + Dieldrin	3600	-	-	<0.2 (LRL)
	Chlordane	45	-	-	<0.1 (LRL)
	DDT+DDE+DDD	530	-	640 (DDT)	<0.1 (LRL)
	Endosulfan	2000	-	-	<0.1 (LRL)
	Endrin	100	-	-	<0.1 (LRL)
	Heptachlor	50	-	-	<0.1 (LRL)
	HCB	80	-	-	<0.1 (LRL)
	Methoxychlor	2500	-	-	<0.1 (LRL)
OPP	Chlorpyrifos	2000	-	-	<0.1 (LRL)
PCB ²		7	-	-	<5 (LRL)

Notes to Table: # Management limits - Table 1 B(7), Schedule B1 of NEPC (2013) LRL – Laboratory reporting limit

1. Sum of carcinogenic PAH 2. Non dioxin-like PCBs only 3. NL – not limiting

With respect to asbestos concentrations, as per NEPC (2013) *Table 7: Health Screening Levels for Asbestos Contamination in Soil* no asbestos is to be visible at the surface whilst concentrations for bonded ACM are to be less than 0.05 % w/w and concentrations for asbestos fines / fibrous asbestos (AF/FA) are to be less than 0.001 % w/w.

It is noted that the benzo(a)pyrene (B(a)P) ecological screening level in NEPC (2103) is a low reliability value. Higher reliability screening levels have been published in CRC CARE *Risk-based Management and Remediation Guidance for Benzo(a)pyrene* (CRC CARE, 2017). As such, the high reliability value of 172 mg/kg for fresh B(a)P has been adopted for the RAC.

For the purpose of providing screening criteria to compare laboratory results against for assessing virgin excavated natural material (VENM), the published background concentrations in ANZECC/NHMRC (1992) *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites, Environmental Soil Quality Guidelines* Background A [ANZECC A] have been adopted. In the case of organics, where no reference values exist the LRL has been adopted as the screening level.

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Appendix G

Data Quality Objectives

Appendix G

Data Quality Objectives

Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek

G1.0 Introduction

The objective of the validation plan is to assess whether the remediation as outlined in Section 11 and which primarily comprises a combination of off-site disposal and consolidation of stockpiled soils (placed at depth) has been successfully completed. Successful completion will also be with respect to the remediation action plan (RAP) more generally and assess the resultant suitability of the site for the intended industrial warehouse development. Moreover, the validation assessment is to provide information on environmental impacts which may have resulted from the works.

The validation assessment will be conducted with reference to the seven step data quality objectives (DQOs) as outlined in NEPC (2013), described below. The DQO in NEPC (2013) is in turn, based on the DQO process outlined in USEPA (2006), and associated guidelines.

G2.0 Data Quality Objectives

Table 1: Data Quality Objectives

Step	Summary
1: State the problem	The site requires remediation and validation of remediation in order to render it suitable for industrial land use. The objective of the validation plan is to confirm the successful implementation of this RAP. A conceptual site model (CSM) for the proposed development has been prepared (Section 7).
2: Identify the decisions / goal of the study	The CSM identifies the contaminants of potential concern (CoPC) and the likely impacted media. The key CoPC impacting the site are: • Asbestos; • Copper; • Zinc; and • Total recoverable hydrocarbons. The validation sampling results are to be compared against the RAC. The preferred remediation strategy as outlined in the RAP is a combination of excavation and off-site disposal of contaminated soils and consolidation of stockpiled soils which are placed at depth (below 2 m relative to final development surface level) and above the groundwater table. The success of the remediation and subsequent validation will be based on a comparison of the analytical results for all relevant CoPC to the adopted RAC and, if necessary, compared to the 95% UCL of the mean concentrations.

Step	Summary
3: Identify the information inputs	Relevant inputs to the decision include: • Results from previous investigations (including mapping and other desktop information); • The CSM, identifying the CoPC and affected media; • Results analysed for the relevant CoPC using NATA accredited laboratories and methods, where possible; • Field results (e.g., 10 L asbestos sieve results); • Field and laboratory QA / QC data to assess the suitability of the environmental data for the validation assessment; • Results compared with the remediation action criteria (RAC); • Assessments of aggregates, soil, etc. imported as part of the works prior to site validation; • Inspections, including of the remedial works, stockpiles, stockpile footprints and where the stockpile material has been placed; • Review of the survey(s) showing location and depth of the stockpile material has been placed; and • Details of the proposed development.
4: Define the study boundaries	The lateral boundaries of the site are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment, site observations and previous investigations used to inform the RAP.
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with RAC. Initial comparisons are to be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field and laboratory replicate results, RPDs should generally be below 30%, whilst for field blanks results should be at or less than the limits of reporting (NEPC, 2013).
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site and/or statistical analysis of data exceed the RAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site and statistical analysis of data complies with the RAC and / or contaminants have been placed at depth that no longer pose a risk to ecological receptors and as such do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.

Step	Summary
7: Optimise the design for obtaining data	Sampling design and procedures to be implemented to optimise data collection for achieving the DQOs include the following: • Sampling frequencies in accordance with Section 13.4 and with reference to other relevant guidance (e.g., NSW EPA (2022), WA (2009), WA (2021), etc.); • Analysis for the CoPC at NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis whenever possible; • Adequately experienced environmental scientists/engineers will conduct field work and sample analysis interpretation; • Visual inspections by the Environmental Consultant of remedial works, stockpiles, stockpile footprints and where the stockpile material has been placed; and • Survey of the area(s) where stockpile material has been placed at depth (refer to Section 11.3.3).

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Appendix H

Site Management Plan

Appendix H

Site Management Plan

Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek

H1.0 Introduction

This site management plan (SMP) has been developed to minimise potentially adverse impacts on the environment, and worker and public health as a result of the proposed remediation works.

The Remediation Contractor must have in place a construction environmental management plan (CEMP) (or similar) which is specific to the equipment used for the remediation and the proposed methods to be adopted by the Remediation Contractor. This SMP has been prepared to augment the Remediation Contractor's CEMP and contains general details for aspects of the work, as per reporting requirements for a remediation action plan (RAP) under NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

Apart from the management principles outlined in this SMP, the Remediation Contractor must also ensure compliance with all relevant environmental legislation and regulations, including (but not limited to) the following:

- *Contaminated Land Management Act 1997* NSW (CLM Act);
- *Protection of the Environment Operations Act 1997* NSW (POEO Act);
- *Protection of the Environment Legislation Amendment Act 2011* NSW;
- *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008* NSW.
- *Environmentally Hazardous Chemicals Act 1985* NSW;
- *Environmental Offences and Penalties Act 1989* NSW;
- *Pesticide Act 1999* NSW and *Pesticides Regulation 2017*; and
- *Work Health and Safety Act 2011* NSW (as updated 2020) and *Work Health and Safety Regulation 2017* NSW (as updated 2022).

H2.0 Roles and Responsibilities

H2.1 Principal

The Principal (ESR Australia) is responsible for the environmental performance of the proposed remediation works, including implementation of acceptable environmental controls during remediation works. The Principal retains the overall responsibility for ensuring this RAP is appropriately implemented. The Principal is to nominate a representative (the Principal's Representative), who is responsible for overseeing the implementation of this RAP.

The actual implementation of the RAP may, however, be conducted by the Principal Contractor on behalf of the Principal. Whilst this is the expected preferred approach, the arrangement is to be confirmed between the Principal and Principal Contractor at the time of the Principal Contractor's engagement.

The Principal is responsible for providing appropriate information to the Principal Contractor to allow them to safely plan the required works. This includes the existing asbestos register and management plan for the school and this RAP.

The Principal is also responsible for implementing an appropriate communications plan

H2.2 Principal Contractor

The Principal Contractor is expected to be the party responsible for daily implementation of this RAP (see Section J2.1) and shall fulfil the responsibilities of the Principal Contractor as defined by SafeWork NSW. It is noted that the Principal Contractor may appoint appropriately qualified sub-contractors or sub-consultants to assist in fulfilling the requirements of the procedures. The Principal Contractor is to appoint a Site Manager.

In addition to the implementation of the RAP it is the Principal Contractor's responsibility to *inter alia*:

- Obtain / ensure relevant sub-contractors obtain specific related approvals as necessary to implement the earthworks, including for example, permits for removal of asbestos-containing material, SafeWork NSW notification, etc.;
- Develop or request and review any site plans required to manage the works to be conducted;
- Ensure that all remediation works and other related activities are undertaken in accordance with this RAP;
- Maintain all site records related to the implementation of this RAP;
- Ensure sufficient information is provided to engage or direct all required parties, including sub-contractors, to implement the requirements of the RAP other than those that are the direct responsibility of the Principal Contractor;
- Manage the implementation of any recommendation made by those parties in relation to work undertaken in accordance with the RAP;
- Inform, if appropriate, the relevant regulatory authorities of any non-conformances with the procedures and requirements of the RAP in accordance with the procedures outlined in this document;
- Retain records of any contingency actions;
- On completion of the project, to review the RAP records for completeness and update as necessary; and
- Recommend any modification to general documentation which would further improve the environmental outcomes of this RAP.

H2.3 Surveyor

The project surveyor is to be a registered surveyor engaged by the Contractor to undertake surveying works as required by this RAP.

H2.4 Remediation Contractor

The Remediation Contractor is foreseen to be the party responsible for the general remediation works. It is noted that the Remediation Contractor may appoint appropriately qualified sub-contractors or sub-consultants to assist in fulfilling the requirements of the remediation works.

In addition to the implementation of the RAP it is the Remediation Contractor's responsibility to *inter alia*:

- Obtain specific related approvals as necessary to implement the works that are the direct responsibility of the Remediation Contractor;
- Ensure work health safety (WHS) site monitoring and mitigation practices are being undertaken as required by the Occupation Hygienist (and Environmental Consultant where appropriate);
- Undertake testing of imported materials (e.g., soils, aggregates, etc.);
- Keep records of materials being imported and removed from site;
- Keep records of soil remediation works including excavations and where contaminated soils are being stockpiled and placed;
- Develop or request and review plans to manage remediation works;
- Undertake surveys and providing surveys to the Principal Contractor;
- Check all site works, and other related activities are undertaken in accordance with this RAP;
- Maintain all site records related to the implementation of remedial works as outlined herein;
- Review and approve all quality assurance documentation prior to providing to the Principal Contractor and Environmental Consultant;
- Providing documentation to the Principal Contractor and Environmental Consultant for review and approval (e.g., products specifications);
- That sufficient information has been provided to engage or direct all required parties, including sub-contractors, to implement the requirements of the remedial works required under the RAP that are the direct responsibility of the Remediation Contractor;
- Inform the Principal Contractor any non-conformances with the procedures and requirements of the RAP in accordance with the procedures outlined in this document;
- Retain records of any contingency, unexpected finds protocol and asbestos finds protocol actions;
- On completion of the remedial works, to review the RAP records for completeness and update as necessary that are the direct responsibility of the Remediation Contractor; and
- To recommend any modification to general documentation which would further improve the environmental outcomes of this RAP.

The Remediation Contractor may be the same entity as the Principal Contractor or Asbestos Contractor.

H2.5 Asbestos Contractor

The Asbestos Contractor is responsible for undertaking all asbestos work involving any asbestos impacted filling and is to hold a Class A licence for the removal of asbestos (issued by SafeWork NSW), on the basis that the asbestos identified at the site to date has included both friable and bonded asbestos.

The Asbestos Contractor can be the same entity as the Principal Contractor.

H2.6 Sub-contractors

All sub-contractors are to be inducted onto the site, informed of their responsibilities in relation to this RAP and sign their agreement to abide by the RAP requirements. Signing of the site induction is to include agreement by the sub-contractors to abide by the RAP requirements. Where necessary, sub-contractors are also to be trained in accordance with the requirements of this document. All sub-contractors must conduct their operations in accordance with the RAP as well as all applicable regulatory requirements.

It is expected that an induction form referring the above will be incorporated into the Construction Environmental Management Plan provided by the Principal Contractor for the site.

H2.7 Environmental Consultant

The Environmental Consultant is to provide advice on implementing the RAP. The Environmental Consultant is responsible for *inter alia*:

- Undertaking any required assessments where applicable (e.g., waste classification, validation sampling, assessments of soil treatment, etc.);
- Undertaking inspections as part of the validation process;
- Providing advice and recommendations arising from inspections;
- Reviewing documentation and results provided by the Principal Contractor and Remediation Contractor (e.g., surveys);
- Notifying their client with the results of any assessments and any observed non-conformances in a timely manner; and
- Preparation of a final validation report confirming the suitability of the site for the proposed industrial warehouse development.

H2.8 Licenced Asbestos Assessor

A Licenced Asbestos Assessor will be required to be engaged independently of the Asbestos Contractor to undertake the following *inter alia*:

- Review and approve documentation prepared by the Asbestos Contractor;
- Preparation of the construction phase AMP;

- Prepare any WHS plans and advice required by the aforementioned contractor(s);
- Undertake airborne asbestos monitoring;
- Undertake clearance inspections;
- Provide advice and recommendations arising from monitoring and/or inspections; and
- Notify their client with the results of any assessments and any observed non-conformances in a timely manner.

The Environmental Consultant and Occupational Hygienist can be the same entity.

H2.9 Site Workers

All workers on the site are responsible for observing the requirements of this RAP and other management plans. These responsibilities include the following:

- Being inducted on the site and advised of the general nature of the remediation / environmental issues at the site. A record of all personal inducted to the site as per Section H2.6;
- Being aware of the requirements of this plan;
- Wearing appropriate personal protective equipment (PPE) as required by this plan;
- Only entering restricted areas when permitted; and
- Requesting clarification when unclear of requirements of this or any other plans (e.g., safe work method statements (SWMS)).

H3.0 Stormwater Management

H3.1 Stormwater

Stormwater must be managed during the remediation works such that potential adverse impacts from surface runoff (e.g., cross contamination, mobilisation of contaminants in soil particles, etc.) are appropriately mitigated. Accordingly, the Remediation Contractor is to take appropriate measures which may include:

- Construction, where necessary, of stormwater diversion channels, bunding and linear drainage sumps with catch pits in and around the remediation areas to divert stormwater from the contaminated areas;
- Provision of appropriately located sediment traps including geotextiles; and
- Discharge of excess water in excavations / low points on a regular basis to limit the potential for flooding.

H3.2 Dewatering of Excavations

Any runoff or seepage water accumulated in site excavations that requires removal must initially be sampled and tested for suspended solids, pH and any contaminants of potential concern (CoPC) as identified by the Environmental Consultant (also refer to the conceptual site model in the report (Section 7)). The options for management of excavation pump-out water, dependent upon the test results, are for disposal of the water as follows:

- Discharge to stormwater with prior approval from Council. Provided the test results comply with relevant ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018), or any other compliance requirements stipulated by Council. The Environmental Consultant must consider the most appropriate criteria to be used; or
- Discharge to sewer, as industrial trade wastewater, with prior approval from Sydney Water. This option would require the analysis of a larger list of analytes, and compliance with the Sydney Water acceptance standards; or
- Pumping by a liquid waste contractor for removal of the water off-site, in accordance with regulatory requirements.

Note that, depending on the type and scale of the dewatering required, a permit (water use approval) may need to be obtained through NSW Water. In this regard, obtaining permits from aforementioned organisations can take significant time periods and hence this should be considered during project planning.

H4.0 Soil Management Plan

H4.1 Excavation and Stockpiling of Contaminated Material

Contaminated material shall be excavated and stockpiled at a suitably segregated location(s) away from sensitive areas (e.g., water bodies, drainage lines, stormwater pits, etc.) and ongoing excavations, and in a manner that will not cause nuisance to the neighbouring properties. Soil stockpiles are to be managed as follows:

- All stockpiles of contaminated material shall be surrounded by star pickets and marking tape or other suitable material to clearly delineate their boundaries;
- Stockpiles shall be lightly conditioned by sprinkler or covered by geotextile or similar cover to prevent dust generation;
- Any stockpile to remain on-site overnight should be adequately secured in order to reduce the risk of sediment runoff; and
- Should the stockpile remain on-site for over 48 hours, geotextile silt fences should be erected to prevent losses by surface erosion.

All movement of soil within the site and off-site is to be tracked by the Remediation Contractor, from cradle to grave. Copies of tracking records must be provided to the Environmental Consultant.

H4.2 Loading and Transport of Contaminated Material

Transport of contaminated material from the site shall be via a clearly delineated haul route and this route shall be used exclusively for entry and egress of vehicles used to transport contaminated materials within and away from the site. The proposed waste transport route (to be determined by the Remediation Contractor) is to be notified to Council and truck dispatch shall be logged and recorded by the Remediation Contractor for each load leaving the site. A record of the truck dispatch is to be provided to the Environmental Consultant.

All haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site should be selected to meet the following objectives:

- Comply with all road traffic rules;
- Minimise noise, vibration and dust to adjacent premises; and
- Utilise State roads and minimise use of local roads as far as practicable.

The remediation work is to be conducted such that all vehicles:

- Conduct deliveries of soil, materials, equipment or machinery only during the specified hours of remediation;
- Have securely covered loads to prevent any dust or odour emissions during transportation; and
- Exit the site in a forward direction.

In addition, appropriate measures are to be implemented by the Remediation Contractor to minimise the potential for contaminated material to be spilled onto public roadways or tracked off-site on vehicle wheels (e.g., covering of loads, wheel wash, etc.). Roadways are to be kept clean throughout the remediation works and are to be broomed, if necessary, to achieve a clean environment.

All loads are to be securely covered and may be lightly wetted, if required, to ensure that no materials or dust are dropped or deposited outside or within the site. Prior to exiting the site each truck should be inspected by Remediation Contractor personnel and either noted as clean (wheels and chassis) or broomed prior to leaving the site. Any soil spilled onto surrounding streets is to be cleaned by mechanical or hand methods, on a daily basis.

Removal of waste materials from the site shall only be carried out by contractors holding the appropriate license(s), consent or approvals to dispose the waste materials according to the waste classification and with the appropriate approvals obtained from the EPA, were required. It is noted that any asbestos waste / asbestos impacted soil transported in NSW weighing more than 100 kg or consisting of more than 10 m² of asbestos sheeting in one load is required to be recorded utilising the NSW EPA tool, WasteLocate.

H5.0 Noise and Vibration Control Plan

All equipment and machinery should be operated in an efficient manner to minimise the emission of noise. The use of any plant and/or machinery should not cause unacceptable vibrations to nearby properties and are to meet Council requirements.

H6.0 Dust Control Plan

Dust emissions are to be confined within the site boundary as far as is practicable. The following example dust control procedures could be employed to comply with this requirement, as necessary:

- Erection of dust screens around the perimeter of the site (as applicable);
- Securely covering all loads entering or exiting the site;
- Use of water sprays across the site to suppress dust;
- Covering of all stockpiles of contaminated soil with friable asbestos remaining on site more than 24 hours;
- Covering of all contaminated soils when high winds are being, or are likely to be, encountered;
- Include wheel wash (if applicable); and
- Keeping excavation and stockpile surfaces moist.

Regular checking of the fugitive dust issues is to be undertaken. Remedial measures are to be undertaken to rectify any cases of excessive dust.

H7.0 Odour Control Plan

No odours should be detected at any boundary of the site during remediation works by an authorised Council Officer relying solely on sense of smell. The following example procedures could be employed to comply with this requirement as required:

- Use of appropriate covering techniques such as plastic sheeting, polythene or geotextile membranes to cover excavation faces or stockpiles;
- Fine spray of water and / or hydrocarbon mitigating agent on the impacted areas / materials;
- The use of water spray, as and when appropriate;
- Use of sprays or sprinklers on stockpiles or loads to lightly condition the material;
- Restriction of stockpile heights to ~4 m above surrounding site level. If required, restrict uncovered stockpiles to appropriate sizes to minimise odour generation;
- Ceasing works during periods of inclement weather such as high winds or heavy rain;
- Regular checking of the fugitive dust and odour issues to ensure compliance. Undertake immediate remediation measures to rectify any cases of excessive dust or odour (e.g., use of misting sprays or odour masking agent); and
- Adequate maintenance of equipment and machinery to minimise exhaust emissions.

H8.0 Work Health and Safety Plan

H8.1 General

It is the Remediation Contractor's responsibility to devise a SWMS¹ (or series thereof, for various respective tasks) and to implement proper controls that enable the personnel undertaking the remediation to work in a safe environment. This RAP and SMP does not relieve the Remediation Contractor or other contractors of their ultimate responsibility for occupational health and safety of their workforce and to prevent contamination of areas outside the 'remediation' workspace. To assist, this RAP and SMP sets out general procedures and the minimum standards and guidelines for remediation that will need to be used in preparing the safe work method statement.

This outline of a work health safety plan (WHSP) has been prepared with reference to CRC CARE *Remediation Action Plan: Implementation - Guideline on Health and Safety* (CRC CARE, 2019). The requirements of this WHSP must be incorporated into the Remediation Contractor's SWMS.

All site work must be undertaken in a controlled and safe manner with due regard to potential hazards, training and safe work practices. To attain this the SWMS developed by the Remediation Contractor must comply with policies specified in the *Work Health and Safety Regulation 2017*.

All appropriate permits, licences and notifications required for the remediation activities must be obtained prior to the commencement of remediation works.

H8.2 Site Access

Appropriate fencing and signage is to be installed around and within the site to prevent unauthorised access and restrict access to remediation areas and/or deep excavations. Access restrictions and administrative arrangements for management of entry of workers or related personnel on site is the responsibility of the Principal Contractor and Remediation Contractor.

Any existing pits or unstable areas on site that may generate potential safety, or operational risk should be demarcated and taped off, with appropriate rectification action undertaken (e.g., backfilling of pits).

H8.3 Personnel and Responsibilities

Before undertaking works on site, all personnel are to be made aware of the officer responsible for implementing WHS procedures. All personnel must read and understand this WHSP and over-arching SWMS prior to commencing site works and sign a statement to that effect. Contractors employed at the site are responsible for ensuring that their employees are aware of, and comply with, the requirements of this WHSP and Remediation Contractor's SWMS.

¹ Either a SWMS or construction environmental management plan (CEMP), or other equivalent document incorporating health and safety aspects of the proposed remedial works.

H8.4 Contamination Hazards

Contamination compounds or substances that may be present in the soils at the site include the key CoPC metals, TRH and asbestos. There is also a lower probability of other contaminants being present.

The risks associated with the identified chemical contaminants to site personnel and workers involved in the remediation are considered to be low due to the concentrations within soils and limited exposure durations. These risks are associated with:

- Ingestion of contaminated soil and/or water;
- Dermal contact with contaminated soil and / or water; and
- Inhalation of dusts or vapours of the CoPC.

Personnel are to endeavour, wherever possible, to avoid direct contact with potentially contaminated material. Workers must avoid the potential exposures listed above as far as is practicable. Appropriate personal protective equipment (PPE) must be used to mitigate potential risks.

H8.5 Physical Hazards

The physical hazards are associated with conditions that may be created during remediation works include (but not limited to):

- Heat exposure;
- Excavations;
- Buried services;
- Noise;
- Dust;
- Electrical equipment;
- Heavy equipment and truck operation; and
- Asbestos.

Safe work practices must be employed to manage the physical risks identified above. For the most part these risks can be managed through appropriate demarcation, access controls, signage and the use of appropriate PPE.

H8.6 Safe Work Practices

The appropriate safe work practices should be clearly defined by the Remediation Contractor in their SWMS. As a minimum, all personnel on site are to wear the following PPE:

- Steel-capped boots (mandatory);
- High visibility clothing / vest (mandatory);
- Safety glasses or safety goggles with side shields requirements (as necessary);

- Hard hat (as necessary);
- Appropriate respiratory and protective equipment for any works involving asbestos (as necessary); and
- Hearing protection when working in the vicinity of machinery or plant equipment if noise levels exceed exposure standards (as necessary).

Each item of PPE is to meet the corresponding relevant Australian Standard(s).

Specific safe work practices are to be adopted when working with asbestos, in accordance with (but not limited to) the following codes of practice:

- SafeWork NSW Code of Practice, How to Manage and Control Asbestos in the Workplace (SafeWork NSW, 2019a)
- SafeWork NSW Code of Practice, How to Safely Remove Asbestos (SafeWork NSW, 2019b);
- WorkCover NSW Managing Asbestos in or on Soil (WorkCover NSW, 2014); and
- NOHSC Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Ed (NOHSC, 2005).

H9.0 Remediation Schedule and Hours of Operation

The remediation works are to be conducted within the days and hours specified in the development consent.

H10.0 Response to Incidents

The key to effective management of incidents is the timely action taken before any situation reaches a reportable or critical level. Therefore, surveillance activities are extremely important, and should be conducted for the measures prescribed herein and any other measures prescribed in any additional environmental management plan developed subsequently. During construction activities on the site, the following inspection or preventative actions is to be performed by the Principal Contractor and Remediation Contractor:

- Regular inspection of works;
- Completion of routine environmental checklists and follow-up of non-compliance situations;
- Maintenance and supervision on-site; and
- An induction process for site personnel involved in the remediation works that includes relevant information on the contamination status of the site, the remediation works being undertaken, worker health and environmental protection requirements and ensures that all site personnel are familiar with the site emergency procedures.

An emergency response plan is to be in place for all aspects of site works. Any emergency is to be reported immediately to the site office and / or the Site Manager (and Safety Officer), and the appropriate emergency assistance should be sought. The Site Manager should be responsible for initiating an immediate emergency response using the resources available on the site. Where external assistance is required, the relevant emergency services should be contacted. A table such as the example below, containing contact details for key personnel who may be involved in an environmental emergency response should be completed and be readily available to personnel at all times. The table should be completed, and thereafter amended, as required.

The Remediation Contractor will be responsible for ensuring that site personnel are aware of the emergency services available and the appropriate contact details. A site Safety Officer should be contactable, or available, on-site during remediation and development works.

Contact details for key utilities are included in the event of needing to respond to incidents. Blank cells are 'to be confirmed' and should be completed prior to works commencing when all entities are confirmed.

Table 1: Summary of Roles and Contact Details (Example)

Role	Personnel / Contact	Phone Contact Details
Principal		
Principal's Representative		
Site Manager		
Remediation Contractor and Builder		
Site Office		
Environmental Consultant		
Occupational hygienist		
Consent Authority		
Regulator	NSW EPA (pollution line and general enquiries)	131 555
Utility Provider	Water (Sydney Water Corporation)	13 20 92
Utility Provider	Power (Ausgrid)	13 13 88
Utility Provider	Gas (Jemena Limited)	131 909
Utility Provider	Telecommunications (Telstra Corporation Limited)	13 22 03
Utility Provider	Telecommunications (Optus)	1800 505 777
Utility Provider	Telecommunications (NBN Co Limited)	1800 687 626

H11.0 References

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

CRC CARE. (2019). *Remediation Action Plan: Implementation - Guideline on Health and Safety*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

NOHSC. (2005). *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Ed*. Canberra, April 2005, NOHSC:3003: National Occupational Health and Safety Commission, Commonwealth of Australia.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

SafeWork NSW. (2019a). *Code of Practice, How to Manage and Control Asbestos in the Workplace*. August 2019.

SafeWork NSW. (2019b). *Code of Practice, How to Safely Remove Asbestos*. August 2019: SafeWork NSW, NSW Government.

WorkCover NSW. (2014). *Managing Asbestos in or on Soil*. March 2014: WorkCover NSW, NSW Government.

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Appendix I

Contingency Plan, Unexpected Finds Protocol
and Asbestos Finds Protocol

Appendix I

Contingency Plan, Unexpected Finds Protocol and Asbestos Finds Protocol Westlink Stage 2, 1030-1064 Mamre Road, Kemps Creek

I1.0 General

Where the site conditions are found to be different than that anticipated during the remediation works, the proposed remediation approach may not be appropriate for the contamination encountered. In such cases the Environmental Consultant is to re-assess the contamination and remediation approach. Where necessary the Environmental Consultant will prepare an addendum to, or revision of, this RAP.

I2.0 Contingency Plan

This contingency plan has been developed to provide guidance on processes to follow if contamination (or indicators of contamination), other than that included in the remediation strategy, (Section 11) is encountered during the remediation works. Any such finds shall be surveyed, and the location documented.

Although the site has been subject to previous investigation(s), there remains a potential for soil contamination to be present between sampled locations. In the event that signs of soil contamination, other than that included in the remediation strategy, are encountered during remediation e.g., evidence of asbestos containing materials in areas not previously encountered, petroleum, or other chemical odours which weren't previously identified the following protocols are to apply:

- The Principal Contractor's Site Manager is to be notified and the affected area closed off by the use of barrier tape and warning signs (or similar);
- The Environmental Consultant is to be notified to inspect the area and assess the significance of the potential contamination and determine the extent of remediation works (if deemed necessary) to be undertaken. An assessment report and management plan detailing this information is to be compiled by the Environmental Consultant and provided to the Principal's Representative where considered appropriate (e.g., where additional or alternate remediation is required);
- A suitable remediation / mitigation strategy is to be prepared by the Environmental Consultant in consultation with the Principal's Representative and the Principal Contractor;
- The Principal Contractor or Principal's Representative is to notify to the Consent Authority or Private Certifier (as appropriate) of the works if required by the development consent;
- The agreed management / remedial strategy, based on the RAP and relevant guidelines (e.g., WA DoH (2021)¹ for asbestos issues), shall be implemented; and

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WA DoH. (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. WA Department of Health.

- All details of the assessment and remedial/mitigation works are to be included in the site validation report.

13.0 Unexpected Finds Protocol and Asbestos Finds Protocol

The following unexpected finds protocol (UFP) and asbestos finds protocol (AFP) has been developed to provide guidance on processes to follow if any unexpected find (including asbestos in areas where it has not previously identified / encountered) is encountered during the remediation or future civil and construction works. Any unexpected finds or asbestos find should be surveyed, and the location documented.

All personnel are to be inducted into their responsibilities under this (UFP and AFP), which should be included or referenced in the Principal Contractor's construction environmental management plan.

All personnel are required to report unexpected signs of environmental concern to the Principal Contractor's Site Manager if observed during the course of their works e.g., presence of potential unexploded ordinance, unnatural staining, potential contamination sources (such as buried drums or tanks), chemical spills, asbestos where not anticipated to be present, etc.

Should signs of concern be observed, the Principal Contractor's Site Manager, as soon as practical, is to:

- Stop work in the affected area and ensure the area is barricaded to prevent unauthorised access;
- Notify authorities to obtain emergency response for any health or environmental concerns (e.g., fire brigade), if required;
- Notify the Principal's Representative of the occurrence;
- Notify any of the authorities that the Principal Contractor is legally / contractually required to notify (e.g., NSW EPA, Council); and
- Notify the Environmental Consultant (or Occupational Hygienist, as appropriate).

The Principal's Representative is to notify any of the authorities which the Principal is legally / contractually required to notify (e.g., EPA, Council). Where appropriate the Principal's Representative is to also implement appropriate stakeholder consultation.

The Environmental Consultant is to assess the extent and significance of the find and develop an investigation, remediation / mitigation approach using (where possible and suitable) the principles and procedures already outlined in the RAP.

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