Supplementary Contamination Assessment and Remedial Action Plan

Project

Canterbury Olympic Ice Rink
Portion of 17A Phillips Avenue, Canterbury, NSW 2193

Prepared for

Canterbury Olympic Ice Rink

Date

29/01/2024

Report No

18587-ER-4-1

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Document Control

Revision	Date	Author	PM Review	Technical Peer Review	Approved By
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No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance.

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Should additional information that may impact on the findings of this report be encountered or site conditions change, Alliance reserves the right to review and amend this report.

Executive Summary

Alliance Geotechnical Pty Ltd (Alliance) was engaged by The Ice Skating Club of NSW Cooperative Limited to prepare a remedial action plan (RAP) for a portion of 17A Phillips Avenue, Canterbury (refer **Figure 1,** with the 'site' boundaries outlined in **Figure 2**).

At the commencement of the project, Alliance had the following project appreciation:

- The site is owned by The Council of the Municipality of Canterbury;
- The site is predominantly unsealed vegetation with a small portion in the northeast corner occupied with part of an existing ice rink building;
- The site is proposed for redevelopment, including demolition of grandstands, removal of hardstand and existing lighting to make way for the construction of an extension with a lift pit and above ground alterations to the western portion. A copy of the proposed development plans is presented in **Appendix C.** In the context of land contamination, this is considered to be a land use scenario generally consistent with:
    - Commercial / industrial such as shops, offices, factories, and industrial sites.
- The proposed land use scenario will include a reticulated potable water supply will be available at the site;
- A preliminary site investigation (PSI) of the site was reported in Alliance (2024a). The PSI identified a number of potential land contamination risks at the site, and further assessment by way of a detailed site investigation (DSI) of those risks was recommended;
- A waste classification and virgin excavated natural material (VENM) assessment of the site was reported in Alliance (2024b). The chemical data from Alliance (2024b) was utilised as part of the DSI investigation;
- A detailed site investigation (DSI) of the site was reported in Alliance (2025). The DSI found that detected concentrations of friable asbestos in TP03 (AEC01) may present an unacceptable land contamination risk at the site, which requires management and/or remediation, in order for the site to be suitable for the proposed land use scenario;
- This SCA and RAP is required to assist the client to address:
    - the identified unacceptable land contamination risks in Alliance (2025) and
    - development consent decision making processes set out in State Environmental Planning Policy (SEPP) Resilience and Hazards 2021[1].
- The client's preference for remedial works is excavation and offsite disposal of the impacted soils within AEC01 and at the completion of the remedial works set out in the RAP, is to not have a:
    - a covenant registered on the land title;
    - a notation on a planning certificate for the site; and
    - an environmental management plan (EMP) for the site.

[1] 'SEPP55 – Remediation of Land' was repealed on 1 March 2022

- The client does not require report deliverables to be reviewed by a Certified Environmental Practitioner – Site Contamination Specialist (CEnvP-SC).

The objectives of this project was to prepare a remedial action plan (RAP) with a supplementary contamination assessment (SCA) for the site that contains:

- an assessment into the likely lateral and vertical extents of friable asbestos in soils around TP03;
- recommendations for further investigation, management or remediation of asbestos in soils land contamination (if warranted);
- a remediation objective for the site to facilitate making the site suitable for the proposed land use scenario;
- a methodology for supplementary contamination assessment (SCA) works to address the identified data gaps; and
- a remediation methodology that addresses the identified asbestos impacted land contamination risks at the site.

The following scope of works was undertaken address the project objectives:

- A desktop review of previous reports;
- Preparation of a sampling and analysis quality plan;
- Intrusive investigations on site;
- Laboratory analysis; and
- Data assessment and reporting.

The nominated scope of works was primarily undertaken with reference to relevant sections of NEPC (2013), NSW EPA (2020b), and WA DOH (2009), as well as other references presented in **Section 22**.

The remediation objective is to remediate identified land contamination exposure risks to levels that do not present an unacceptable human health or ecological exposure risk, based on the proposed land use scenario for the site.

The preliminary inferred extent of remedial works required to address the remedial objective, is set out in the table below.

ID	AEC	Contamination Risk	Indicative Volume	Assumptions
AEC01a	Fill materials impacted by asbestos fines around TP03. ($75m^2$ and ~0.6m thick)	Asbestos fines	~$45m^3$	($75m^2$ and ~0.6m thick)

It is noted that these inferred extents are based on a limited set of data. One or more of the extents may be subject to change, as a result of:

- Latent subsurface conditions.

Based on the current understanding of the inferred extent of remedial works required, the proposed land use scenario for the site, and the client's preferred remedial outcomes for the site, the preferred remedial options for the site are presented in the table below.

AEC	Contamination Risk	Preferred Remedial Option and Method
AEC01a	Asbestos fines in fill soils	Excavate soils and offsite disposal

Based on the assessment undertaken by Alliance of site history information, fieldwork observations and data, and laboratory analytical data, in the context of the proposed land use scenario and objectives of this project, Alliance considers that the remediation objective can be achieved and the site made suitable for the proposed land use scenario, subject to the:

- Implementation of the strategies, methodologies, plans and procedures set out in this remediation action plan; and
- Preparation of a site remediation and validation report.

Specific assumptions that apply to the adopted land use scenario, are presented in **Section 6** of this report.

This report must be read in conjunction with the ***Important Information About This Report*** statements at the front of this report.

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1 Introduction

1.1 Background

Alliance Geotechnical Pty Ltd (Alliance) was engaged by The Ice Skating Club of NSW Cooperative Limited to prepare a supplementary contamination assessment (SCA) and remedial action plan (RAP) for a portion of 17A Phillips Avenue, Canterbury (refer **Figure 1,** with the 'site' boundaries outlined in **Figure 2**)**.**

At the commencement of the project, Alliance had the following project appreciation:

- The site is owned by The Council of the Municipality of Canterbury;
- The site is predominantly unsealed vegetation with a small portion in the northeast corner occupied with part of an existing ice rink building;
- The site is proposed for redevelopment, including demolition of grandstands, removal of hardstand and existing lighting to make way for the construction of an extension with a lift pit and above ground alterations to the western portion. A copy of the proposed development plans is presented in **Appendix C.** In the context of land contamination, this is considered to be a land use scenario generally consistent with:
    - Commercial / industrial such as shops, offices, factories, and industrial sites.
- The proposed land use scenario will include a reticulated potable water supply will be available at the site;
- A preliminary site investigation (PSI) of the site was reported in Alliance (2024a). The PSI identified a number of potential land contamination risks at the site, and further assessment by way of a detailed site investigation (DSI) of those risks was recommended;
- A waste classification and virgin excavated natural material (VENM) assessment of the site was reported in Alliance (2024b). The chemical data from Alliance (2024b) was utilised as part of the DSI investigation;
- A detailed site investigation (DSI) of the site was reported in Alliance (2025). The DSI found that detected concentrations of friable asbestos in TP03 (AEC01) may present an unacceptable land contamination risk at the site, which requires management and/or remediation, in order for the site to be suitable for the proposed land use scenario;
- This SCA and RAP is required to assist the client to address:
    - the identified unacceptable land contamination risks in Alliance (2025) and
    - development consent decision making processes set out in State Environmental Planning Policy (SEPP) Resilience and Hazards 2021[2].
- The client's preference for remedial works is excavation and offsite disposal of the impacted soils within AEC01 and at the completion of the remedial works set out in the RAP, is to not have a:
    - a covenant registered on the land title;

[2] 'SEPP55 – Remediation of Land' was repealed on 1 March 2022

  - a notation on a planning certificate for the site; and
  - an environmental management plan (EMP) for the site.
- The client does not require report deliverables to be reviewed by a Certified Environmental Practitioner – Site Contamination Specialist (CEnvP-SC).

1.2 Objectives

The objective of this project was to prepare a remedial action plan (RAP) with a supplementary contamination assessment (SCA) for the site that contains:

- an assessment into the likely lateral and vertical extents of friable asbestos in soils around TP03;
- recommendations for further investigation, management or remediation of asbestos in soils land contamination (if warranted);
- a remediation objective for the site to facilitate making the site suitable for the proposed land use scenario;
- a methodology for supplementary contamination assessment (SCA) works to address the identified data gaps; and
- a remediation methodology that addresses the identified asbestos impacted land contamination risks at the site.

1.3 Scope of Work

The following scope of works was undertaken to address the project objectives:

- A desktop review of previous reports;
- Preparation of a sampling and analysis quality plan;
- Intrusive investigations on site;
- Laboratory analysis; and
- Data assessment and reporting.

The nominated scope of works was primarily undertaken with reference to relevant sections of NEPC (2013), NSW EPA (2020b), and WA DOH (2009), as well as other references presented in **Section 22**.

2 Site Identification

2.1 Site Details

Site identification details are presented in **Table 2.1**.

Table 2.1 Site Identification Details

Cadastral Identification	A portion of Lot 1 in DP818459
Geographic Coordinates (Google Earth)	33º54'34" S and 151º06'47" E
Site Area	Approximately 920m^2
Local Government Authority	Canterbury City Council
Current Zoning	RE1: Public Recreation

A copy of a Section 10.7 planning certificate for the site presented in Alliance (2024a) notes that indoor recreation facilities are permitted with consent on land zoned as RE1 – Public Recreation.

2.2 Site Layout

The layout of the site is presented in **Figure 2**. The layout plan includes locations of:

- Site access points; and
- Current buildings / structures

A copy of a detail and level survey of the site is presented in **Appendix D**.

3 Site Environmental Setting

3.1 Geology

The NSW seamless geology dataset v2.4 accessed via https://minview.geoscience.nsw.gov.au indicated that the site is likely to be underlain by quaternary deposits of silt, clay, (fluvially deposited) lithic to quartz-lithic sand and gravel.

Observations made of the soils encountered during previous investigation works on site within Alliance (2024b and 2025) (outlined in **Section 4.2)**, were recorded on field logs. A copy of the Alliance (2024b) logs are presented in **Appendix C** and a copy of the Alliance (2025a) logs are presented in **Appendix D.** A summary of those observations, in the context of subsurface conditions at the site, is presented in **Table 3.1.**

Table 3.1 Site Specific Geology

Unit	Description	Depth to base of layer (m bgl)
Fill	SAND, fine to medium grained, brown / pale yellow, with fine to coarse gravels of sandstone, ironstone, and brick, trace low plasticity clay, glass, and rootlets, dry to moist.	0.3-1.0
Natural	CLAY, low to medium plasticity, pale grey / orange / red / brown, with fine grained sand, trace rootlets, dry to moist.	1.0-3.4
Natural	Sandy CLAY, low to medium plasticity, pale grey / orange / brown, fine grained sand, trace rootlets, dry to moist.	0.7-1.2

3.2 Site Topography and Elevation

A detail and level survey plan of the site indicated that:

- the topography of the site is generally flat with a minor south-east facing slope.
- the surface of the site was located at an elevation of approximately 5.49m Australian Height Datum (AHD) in the north-east, 5.8m AHD in the north-west, 5.3m AHD in the south-west and 4.74m AHD in the south-east.

A copy of the detail and level survey is presented in **Appendix B.**

3.3 Acid Sulfate Soils

A review of https://www.environment.nsw.gov.au/eSpade2Webapp indicated that the site is located in an area mapped as:

- L4: low probability >3m below ground surface

Assessment of acid sulfate soils was reported in Alliance (2025a) and review of this provided within **Section 4.3**. Further assessment of acid sulfate soils, in the context of this project is considered not warranted.

3.4 Hydrogeology and Hydrology

A review of readily available online maps indicated that surface water bodies located on or near the site included:

- Cooks River, located approximately 160m to the north and east; and
- Cup and Saucer Creek (tributary of the Cooks River), located approximately 990m to the south-east.

Based on the location of the identified surface water bodies and the site surface topography, the inferred groundwater flow direction at the site is considered likely to be towards the south-east.

Based on site surface topography and site elevation, the inferred surface water flow direction at the site is considered likely to be towards the south-east.

A search of https://www.environment.nsw.gov.au/eSpade2WebApp was undertaken by Alliance, and there was no data related to the hydrogeological landscape available for the locality of the site.

A search of https://realtimedata.waternsw.com.au/water.stm indicated that:

- there are four registered groundwater features located within a 500m radius of the site; and
- authorised uses of these monitoring wells include:
    - domestic; and
    - monitoring.

Information presented in records obtained for these registered groundwater monitoring wells, indicated that:

- boreholes were drilled to depths of between 5m and 15m bgl;
- the geology encountered during drilling (using rotary methods) included Gravelly CLAY and Sandy CLAY.
- rock was encountered in GW114567, GW114568 and GW114569 at a depth of 1m bgl, and was comprised of SANDSTONE.
- depth to standing water level was not provided in any wells.
- GW114567, GW114568 and GW114569 had a licence status ‘cancelled’.

The domestic well (GW105215) was located approximately 210m north of the site in an inferred up-gradient location. Based on distance and inferred groundwater flow direction, the potential for plausible contaminant source/s on site to be migrating to that well, is considered to be low to negligible, and not warranting further assessment in the context of this investigation.

The monitoring wells (GW114567, GW114568 and GW114569) were located a minimum of 430m east of the site on the opposite side of the Cooks River (likely associated with horse racing track related infrastructure). Based on distance and inferred groundwater flow direction, the potential for a groundwater contaminant source/s that these wells may be monitoring, to be impacting the site, is considered to be low to negligible, and not warranting further assessment in the context of this investigation.

3.5 Meteorology

The Bureau of Meteorology website (http://www.bom.gov.au/climate/data/index.shtml?bookmark=200) was accessed and a search conducted for climatic information measured by the nearest bureau station to the site. A summary of data obtained from that search is presented in **Table 3.5**.

Table 3.5 Local Meteorology Data Summary

Weather Station Location and Identifier	Mean Annual Temperature (°C)		Mean Annual Rainfall (mm)
	Maximum	Minimum	
Canterbury Racecourse AWS - 066194	23.1	12.4	987.1

4 Previous Contamination Assessments and Results

A copy of the following reports:

- Alliance 2024a 'Preliminary Site Investigation, Canterbury Ice Rink, Portion of 17A Phillips Avenue, Canterbury, NSW 2193' dated 4 December 2024, ref 18587-ER-2-1; and
- Alliance 2024b 'Waste Classification and Virgin Excavated Natural Material Report, Canterbury Ice Rink, Portion of 17A Phillips Avenue, Canterbury, NSW 2193' dated 4 December 2024, ref 18587-ER-1-1.
- Alliance 2025a, 'Detailed Site Investigation, Canterbury Ice Rink, Portion of 17A Phillips Avenue, Canterbury, NSW 2193' dated 10 January 2025, ref 18587-ER-3-1.
- Alliance 2025b, 'Waste Classification, Canterbury Ice Rink, Portion of 17A Phillips Avenue, Canterbury, NSW 2193' dated 29th January 2025, ref 18587-ER-6-1

were reviewed by Alliance.

4.1 Alliance (2024a)

The objectives of this project were to:

- Assess the potential for land contamination to be present at the site as a result of current and previous land use activities;
- Assess whether the site is suitable, in the context of land contamination, for the proposed land use scenario; and
- Provide recommendations for further investigations, and management or remediation of land contamination (if warranted).

The following scope of works was undertaken address the project objectives:

- A desktop review of site history;
- A site walkover to inform an understanding of current site conditions;
- Assessment of data and reporting.

A number of areas of environmental concern (AEC) and contaminants of potential concern (COPC) associated with potential land contaminating activities undertaken at the site, were identified as part of this project. The AEC, land contaminating activity and COPC are presented within **Table 4.1** and

Table 4.1 Alliance (2024a) Source, Pathway and Receptor Links

ID	AEC	Land Contaminating Activity (Source)	COPC
AEC01	Site footprint (920m^2 and ~1m thick)	Uncontrolled filling Migration / leaching of hazardous building materials from adjacent ice-skating rink building Application of termite treatment chemicals on eastern boundary of site (for ice skating rink building)	Petroleum hydrocarbons, polycyclic aromatic hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
	Site footprint (920m^2 and 1m maximum disturbance depth)	Acid sulfate soils	Sulfidic ores and hydrogen sulfide

Based on the assessment undertaken by Alliance of site history information and site walkover observations, in the context of the proposed land use scenario and objectives of this project, Alliance (2024a) made the following conclusions:

- There is a potential for unacceptable land contamination to be present at the site as a result of previous land use activities;
- There is a potential for acid sulfate soils risks requiring management to be present at the site;
- The identified potential land contamination may present an unacceptable human health risk to commercial workers and intrusive maintenance workers;
- The site could be made suitable for the following land use scenario:
    - commercial / industrial such as shops, offices, factories, and industrial sites,

  subject to the undertaking of a detailed site investigation (DSI), and management or remediation of identified unacceptable human health risks (if warranted);

Specific assumptions that apply to the adopted land use scenario, are presented in **Section 6**of this report.

Based on those conclusions, Alliance (2024a) made the following recommendations:

- A DSI should be undertaken to address the identified potentially unacceptable human health risks in this PSI. In the event unacceptable human health risks are identified in the DSI, a remedial action plan (RAP) should be prepared and implemented to address those risks;
- An acid sulfate soils assessment should be undertaken to address the potential for acid sulfate soils risks requiring management to be present at the site (in the context of the proposed development). In the event acid sulfate soil risk requiring management are identified in the DSI, an acid sulfate soils management plan (ASSMP) should be prepared and implemented to address those risks;
- The DSI, acid sulfate soils assessment, and preparation of the RAP and ASSMP (if warranted) should be undertaken by a suitably experienced environmental consultant.

4.2 Alliance (2024b)

The objective of this project was to provide a waste classification and virgin excavated natural material assessment of the materials assessed within the site.

The following scope of work was undertaken to address the project objective:

- Preparation of a sampling and analysis quality plan;
- Intrusive investigations on site comprising drilling of eight boreholes using a combination of a hand auger and push tubes;
- Laboratory analysis of samples for TRH/BTEX, PAH, OCP, PCB, metals (8), asbestos presence / absence, pHF/pHFox field screen and chromium reducible sulfur (CRS); and
- Assessment of data and reporting.

Based on an assessment of desktop review data, fieldwork observations and laboratory analytical data, the report considered that the material assessed at the time of the report would classify as the following:

- The fill material would be classified as General Solid Waste (Non-Putrescible);
- The natural material above 2.0m bgl would classify as virgin excavated natural material; and
- The natural material below 2.0m bgl would not classify as VENM due to detectable concentrations of reduced inorganic sulfur (RIS) above the laboratory limit of reporting and considered to contain sulfidic ores and soils.

A copy of the sampling plan from Alliance (2024b) is presented within **Figure 3**.

See **Appendix C** for a copy of Alliance (2024b) logs.

4.3 Alliance (2025a)

The objectives of this project were to:

- Assess the potential for land contamination to be present in the areas of environmental concern (AEC) identified in the preliminary site investigation (PSI) prepared for the site;
- Assess whether potential acid sulfate soils (PASS) or actual acid sulfate soils (AASS) requiring management identified in Alliance (2024b), in the context of the proposed maximum depth of disturbance and maximum groundwater drawdown depth, for the proposed redevelopment of the site;
- Assess whether identified potential land contamination would present an unacceptable human health or ecological exposure risk, based on the proposed land use scenario;
- Assess whether the site is suitable, in the context of land contamination, for the proposed land use scenario; and
- Provide recommendations for further investigations, and management or remediation of land contamination (if warranted).

The following scope of works was undertaken to address the project objectives:

- A desktop review of previous reports;
- Preparation of a sampling and analysis quality plan;
- Intrusive investigations on site;
- Laboratory analysis; and
- Assessment of data and reporting

A number of areas of environmental concern (AEC) and contaminants of potential concern (COPC) associated with potential land contaminating activities undertaken at the site, have been identified as part of this project. The AEC, land contaminating activity and COPC are presented in the table below.

Table 4.3 Revised Conceptual Site Model

ID	AEC	Land Contaminating Activity (Source)	COPC	Exposure Pathway	Receptor	Outcome
AEC01	Site footprint (920m^2 and ~1m thick)	Uncontrolled filling Migration / leaching of hazardous building materials from adjacent ice-skating rink building	Asbestos fines	Inhalation (asbestos)	Commercial workers Intrusive maintenance workers	The field and laboratory analytical data for site soils were less than or equal the adopted Tier 1 screening criteria, with the exception of asbestos fines within TP03-0-0.2. Further assessment of asbestos fines is considered warranted.

Based on the assessment undertaken by Alliance of site history information, fieldwork observations and data, and laboratory analytical data, in the context of the proposed land use scenario and objectives of this project, Alliance (2025a) made the following conclusions:

- There is a potential for land contamination to be present on the site;
- Detected concentrations of friable asbestos in soils in TP03 (AEC01) may present an unacceptable human health exposure risk. Further assessment would be required to draw a conclusion on that risk;
- The previously issued waste classification assessment Alliance (2024b) is considered to now be out of date and requires updating;
- The site could be made suitable for the following land use scenario:
    - Commercial / industrial such as shops, offices, factories and industrial sites,

  subject to the undertaking of a supplementary contamination assessment (SCA), and management / remediation of identified unacceptable human health exposure risks.
- A duty to report land contamination under section 60 of the Contaminated Land Management Act 1997 can be triggered when:
    - friable asbestos is detected above the adopted health screening level in a soil sample, AND
    - a person has been or foreseeably will be, exposed to elevated levels of asbestos fibres by breathing them into their lungs.

  It is plausible that this test may be satisfied for this site, if it were to be assessed; and
- Specific assumptions that apply to the adopted land use scenario, are presented in **Section** □ of this report.
- In the event the proposed development changes from that which was considered during this assessment, then the data must be re-assessed, which may result in a difference outcome.

Based on these conclusions, Alliance made the following recommendations:

- Alliance (2024b) must be updated to include consideration of this additional data prior to any disturbance of soils;
- An interim management plan (IMP) should be prepared that outline mitigation measures to be implemented onsite to adequately manage identified asbestos risks onsite, prior to further assessment, management or remediation of the site;
- An assessment of whether the friable asbestos in soil test in NSW EPA (2015) has been satisfied, should be undertaken, to inform duty to report land contamination under section 60 of the Contaminated Land Management Act 1997 decision making (noting the decision making may require advice from a suitably experienced legal practitioner);
- A remedial action plan (RAP) should be prepared to address the identified unacceptable human health exposure risks identified within AEC01. The RAP should include a methodology for
    - delineation of identified land contamination risks in AEC01; and
    - validation of management / remedial works.
- Further assessment, management or remedial planning works for the site, be undertaken by a suitably experienced environmental consultant.

A copy of the sampling plan from Alliance (2025a) is presented within **Figure 4**.

See **Appendix D** for a copy of Alliance (2025a) logs and **Appendix E** for a copy of the summary tables.

4.4 Alliance (2025b)

The objective of this project was to provide a waste classification assessment for the asbestos impacted soils located at TP03 and the surrounding soils.

The following scope of work was undertaken to address the project objective:

- Assessment and reporting of data collected in previous reports.

Based on an assessment of desktop review data, fieldwork observations and laboratory analytical data, the report considered that the material assessed at the time of the report would classify as the following:

- The asbestos impacted material identified in TP03 and the surrounding soils would classified as Special Waste (asbestos) as General Solid Waste (Non-Putrescible);
- The remaining fill would be classified as General Solid Waste (Non-Putrescible);
- The natural material above 2.0m bgl would classify as virgin excavated natural material; and
- The natural material below 2.0m bgl would not classify as VENM due to detectable concentrations of reduced inorganic sulfur (RIS) above the laboratory limit of reporting and considered to contain sulfidic ores and soils.

5 Results and Site Characterisation

The results of the previous assessments (refer **Section 4**) have been reviewed. Characterisation of site contamination risks, in a tabular and plan format, is discussed below.

A plan showing the location of sampling point locations at the site, is presented in **Figure 3 and Figure 4**.

Sample descriptions of the media assessed on the site, including soil, are presented in copies of logs presented in **Appendix C and Appendix D**.

A copy of tabulated results from previous contamination assessments that include:

- sample identification numbers and sampling depths;
- adopted contamination assessment criteria;
- highlighted results that exceeded those adopted criteria,

is presented in **Appendix E**.

A plan showing the locations and vertical extent of soil contaminant concentrations that exceeded the adopted contamination assessment criteria, is presented in **Figure 5**.

Alliance notes that the aforementioned plans, descriptions, tables and inferred lateral/vertical extent of soil concentration exceedances of criteria do not include data which may be obtained during the supplementary contamination assessment works proposed **Section 8**.

6 Conceptual Site Model

The conceptual site model takes into consideration the results of previous investigations reported in **Section 4** and the data gaps present in **Section 7**.

6.1 Preamble

A conceptual site model (CSM) is a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM is constructed from the information obtained during the preliminary site investigation (PSI), detailed site investigation (DSI) and supplementary contamination assessment.

The pre-remediation CSM identifies complete (or potentially complete) pathways between the known source(s) and the receptors. In that scenario, management or remediation is needed to break the source-pathway-receptor linkage.

6.2 Land Use

6.2.1 Adopted Land use Scenario

For the purpose of this project, Alliance understands that the proposed land use scenario for the site includes:

- Commercial / industrial such as shops, offices, factories and industrial sites.

Section 3.2.5.3 of NEPC (2013i) advises that:

- although many commercial premises welcome children on an intermittent basis, it is unlikely that children visit the majority of workplaces frequently;
- in commercial premises where children are regular visitors, such as shopping centres, both the duration and frequency of child exposures are generally lower than that of a full-time employee.

Alliance considers an ice-skating rink to be comparable to a shopping centre, in the context of land use scenarios, for the purpose of land contamination assessment.

6.2.2 Assumptions for Adopted Land Use Scenario

Section 3 of NEPC (2013i) advises that the commercial/industrial land use scenario, which assumes typical commercial or light industrial properties, consisting of single or multistorey buildings where work areas are on the ground floor (constructed on a ground level slab) or above subsurface structures (such as basement car parks or storage areas).

The dominant users of commercial / industrial sites are adult employees who are largely involved in office-based or light industrial activities.

The outdoor areas of the commercial/industrial facilities are largely covered by hardstand, with some limited areas of landscaping or lawns and facilities. Opportunities for direct access to soil by employees using these facilities are likely to be minimal, but there may be potential for employees to inhale, ingest, or come into direct dermal contact with dust particulates derived from the soil on the site.

The land use scenario does not include more sensitive uses that may be permitted under relevant commercial or industrial zonings. These more sensitive uses include childcare, educational facilities, caretaker residences, hotels, and hostels, etc. Information on uses permitted under local council zoning schemes for commercial/industrial land use can be obtained from local council planning zones/schemes. Should these more sensitive uses be permitted, then 'residential with accessible soil,' 'residential with minimal access to soil', or 'public open space' land use scenarios should be considered.

6.3 Sources of Contamination

A number of potential land contaminating activities have been identified for the site, based on the results of previous contamination assessments. These include:

- Uncontrolled filling; and
- Use of hazardous building materials on building immediately adjacent eastern boundary.

Table J1 in Appendix J of AS 4482.1-2005[3], Table B1 in Appendix B of WA DWER (2021) and Table B1 and Table B2 in Appendix B of HEPA (2020) provides guidance on chemicals associated with land uses activities. That guidance provides a basis for deciding on contaminants of potential concern (COPC) for each relevant land use activity. Information on COPC adopted for this project is presented in **Section 6.6** of this report.

6.4 Receptors

6.4.1 Identified Receptors

Based on the adopted land use scenario in **Section 6.2**, receptors at the site would primarily be commercial workers and intrusive maintenance workers.

6.4.2 Assumptions for Identified Receptors

The receptors at a commercial/industrial site are predominantly adult employees, who are largely involved in office-based or light indoor industrial activities. The employees who are most susceptible to health risks associated with volatile soil contaminants are the employees who work in offices on the ground floor, as the greatest potential for vapour intrusion occurs with workspaces immediately overlying contaminated soil.

[3] Alliance understands this standard has been withdrawn, however, guidance on the Aged Standards Review process at https://www.standards.org.au/standards-development/aged-standards, indicates that it is still possible for a withdrawn standard to be used within an industry or reference by a government if chosen to do so. On the basis that this standard is referenced in NEPC (2013b), it is considered reasonable to still refer to it, within the context of this project.

Employees may make use of outdoor areas of a commercial/industrial premises for activities such as meal breaks. Opportunities for direct access to soil by employees using these facilities are likely to be minimal, but there may be potential for employees to inhale, ingest, or come into direct dermal contact with dust particulates derived from the soil on the site.

Intrusive maintenance workers are assumed to be adult workers who carry out work in shallow trenches (maximum depth of 1m). The work may include work related to telephone, electricity, gas, water, and sewer. It is also assumed that the workers will follow industry accepted procedures in relation to health and safety. The assumptions do not extend to work in deep trenches (such as deep sewers), on the basis that deep trench work would usually require confined space health and safety procedures to be followed, including the use of personal protective equipment.

In the context of petroleum hydrocarbons, exposure[4] may occur through:

- inhalation of volatiles from contaminants at any depth (soil and groundwater); and
- direct contact (dust inhalation, ingestion, and dermal contact) for contaminated soils from surface to 2m below ground surface (i.e. trench walls for surface to 1m, trench floor 1 to 2m below ground surface).

Potential acute exposure risks or explosion hazards associated with very high concentrations of vapours are not considered in this scenario.

6.5 Exposure Pathways

6.5.1 Human Health

6.5.1.1 Dermal Contact / Ingestion / Dust Inhalation

Based on information in Alliance (2025a),further assessment of dermal contact, dust inhalation or ingestion risk was considered not warranted.

6.5.1.2 Vapour Intrusion / Inhalation

Based on information in Alliance (2025a),further assessment of vapour intrusion / inhalation risks was considered not warranted.

6.5.1.3 Asbestos Containing Materials

Based on information in Alliance (2025a) further assessment of ACM in soil human health exposure risks was considered not warranted.

[4] Section 2.1.4 of Friebel, E & Nadebaum, P 2011

6.5.1.4 Fibrous Asbestos / Asbestos Fines

The Alliance (2025a) report identified that concentrations of FA and AF detected in the soil samples analysed, were less than the adopted health screening level of 0.001% w/w, with the exception of the concentration detected in sample TP03/0.0-0.2 (0.003 % w/w). The sampling points where the exceedances of the adopted criterion occurred, are presented graphically in **Figure 5.**

Further assessment of fibrous asbestos / asbestos fines in soil human health exposure risks is considered warranted.

6.5.2 Management Limits for Petroleum Hydrocarbons

Based on information in Alliance (2025a), further assessment of petroleum hydrocarbons in soils in the context of those policy considerations was considered not warranted.

6.5.3 Hazardous Ground Gases

Based on information in Alliance (2025a)., further assessment of hazardous ground gases in the context of this project, is considered not warranted.

6.5.4 Aesthetics

Based on information in Alliance (2025a), further assessment of aesthetics risks, is considered not warranted.

6.5.5 Terrestrial Ecosystems

Based on information in Alliance (2025a), further assessment of terrestrial ecosystem exposure risks, is considered not warranted.

6.5.6 Groundwater

Based on information within Alliance (2025a), Alliance considered that further assessment of:

- Ecosystem protection;
- Aquaculture and human consumers of food;
- Agricultural water (irrigation and stock water);
- Recreation and aesthetics;
- Drinking water; and
- Industrial water.

as groundwater values, is considered not warranted.

6.6 Source, Pathway and Receptor Links

Based on:

- The identified sources of contamination associated with the locations of where potential land contaminating activities have been undertaken at the site (areas of environmental concern or AEC), and assessment works to attempt to delineate the extent of the source;
- The identified contaminants of potential concern (COPC) associated with those land contaminating activities;
- The receptors identified for the site, based on the proposed land use scenario;
- The exposure pathways between the identified sources and receptors that have been assessed as being potentially or actually complete,

a conceptual site model (CSM) that identifies plausible source-pathway-receptor linkages for the site, is presented **Table 6.6**.

The inferred extents of unacceptable contamination risks based on the CSM, are presented in **Figure 5**.

Alliance notes that the inferred extent of unacceptable contamination risks do not include data which may be obtained during the supplementary contamination assessment works proposed **Section 8**.

Table 6.6 Source, Pathway and Receptor Links

ID	AEC	Land Contaminating Activity (Source)	COPC	Exposure Pathway	Receptor
AEC01	Site footprint (920m^2 and ~1m thick)	Uncontrolled filling Adjacent of hazardous building materials on building immediately adjacent eastern boundary	Asbestos	Inhalation (asbestos)	Commercial workers Intrusive maintenance workers

7 Data Gap Analysis and Uncertainty

Based on a desktop review of previous reports referred to in **Section 4** and the development of the conceptual site model (CSM) presented in **Section 6.6**, Alliance has assessed that the following data gaps, in the context of site contamination characterisation and management, are present and need to be addressed prior to management or remediation:

- The lateral and vertical extent of friable asbestos in soils around TP03, is required to inform management / remediation decisions.

Provision for addressing these data gaps is presented in **Section 8** of this RAP.

8 Supplementary Contamination Assessment (SCA)

8.1 Preamble

Supplementary contamination assessment (SCA) works will be undertaken, to address the data gaps identified in **Section 7** of this RAP.

8.2 Objectives

The objectives of the SCA are to:

- Assess the likely lateral and vertical extents of friable asbestos in soils around TP03;
- Provide recommendations for further investigation, management or remediation of asbestos in soils land contamination (if warranted).

The work required to address these objectives, will be undertaken in the context of the proposed land use scenario adopted for the site.

8.3 SCA Data Quality Objectives

The data quality objectives (DQO) and associated sampling and analysis quality plan (SAQP) for the SCA are presented in the following sub sections.

8.3.1 SCA - Step 1: State the problem

The reason the SCA works are being undertaken, is set out in **Section 8.1** of this report.

The objective of these SCA works is set out in **Section 8.2** of this report.

The project team and technical support experts identified for the project include the Alliance project director, Alliance project manager, Alliance field staff and Alliance's subcontractors.

The design and undertaking of these SCA works will be constrained by the client's financial and time budgets.

The regulatory authorities associated with these SCA works include NSW EPA, the local planning authority, and SafeWork NSW.

8.3.2 SCA - Step 2: Identify the decision / goal of the study

The decisions that need to be made during these SCA work, to address the project objectives, include:

- Is the data collected for the SCA works, suitable for assessing land contamination exposure risks?
- Do the detected concentrations of contaminants of potential concern identified in the CSM, present an unacceptable exposure risk to the receptors identified in the CSM, based on the proposed land use scenario?
- Is the data collected suitable for assessing the likely extent of contamination requiring remediation?

8.3.3 SCA - Step 3: Identify the information inputs

The information inputs required to make the decisions for the project set out in **Section 8.3.2**, include:

- Data obtained during the site history review and site walkover;
- Field and laboratory analytical data from previous contamination assessments at site;
- Identification of sample media that needs to be collected, as set out in **Section 8.3.7.2**;
- Parameters that will be measured in each relevant sample, as set out in **Section 8.3.7.6**;
- The analytical methods required for each identified COPC, so that assessment can be made relative to adopted site criteria. These are set out in **Section 18.7** of this report; and
- The site criteria for the media of concern. These criteria are set out in **Table 18.3** and will be adopted based on the proposed land use scenario[5], identified receptors, and site specific soil conditions (where relevant).

8.3.4 SCA - Step 4: Define the boundaries of the study

The spatial extent of the project will be limited to:

- The boundaries of the site as set out in **Section 2**; and
- Physical constraints or infrastructure on site or on land adjacent to the site, that prevents safe and reasonable access for project team members and/or typical and readily available equipment used for projects of this nature.

The scale of the decisions required (as set out in **Section 8.3.2**) will be based on the boundaries of the site set out in **Section 2**.

The extents of SCA works will be limited to the distribution of contamination assessed in the CSM in **Section 6.6** (associated with the data gaps identified in **Section 7**), which are likely to be:

- The inferred vertical extent of TP03, likely to be to the base of fill material; and
- The inferred lateral boundaries of AEC01.

The time and budget constraints of the SCA works will be as per those set out in the contract (and any subsequent variations to that contract) between the client and Alliance.

The temporal boundaries of the SCA works will include:

- Availability of project team members (including subcontractors and subconsultants) to collect and assess relevant project data;
- The availability of site access to undertake fieldwork; and
- Meteorological conditions including heat, cold, wind and rain, which may constrain undertaking of fieldwork, or may affect the quality of the data being collected.

[5] The land use scenarios in Section 2.2 of NEPC (2013a) will be considered when adopting human health assessment criteria. The land use scenarios in Section 2.5 of NEPC (2013a) will be considered when adopting ecological assessment criteria.

8.3.5 SCA - Step 5: Develop the analytical approach

8.3.5.1 Analytical Laboratory Quality Assurance and Quality Control

The primary analytical laboratory will:

- be NATA accredited for the methods used; and
- produce laboratory reports that are consistent with asbestos in soils quantification assessment guidance in NEPC (2013a) and WA DOH (2009).

The primary analytical laboratory will report on whether the samples submitted are adequate for the purpose of asbestos in soils quantification, and the associated limit of reporting.

8.3.5.2 Data Quality Indicators

A set of data quality indicators (DQI) will be adopted for assessing the completeness, comparability, representativeness, precision and bias (accuracy) of data collected during fieldwork, the analytical data produced by the laboratory. Each of these DQI are set out in **Table 8.3.5.2**.

It is noted that:

- Typical precision DQI related to field duplicates / triplicates, and relevant percentage differences (RPD) calculations; and
- Typical bias (accuracy) DQI relates to fieldwork spikes and blanks, and laboratory spike, blank and control sample analysis

Are not considered relevant to the assessment of asbestos in soils, and on that basis, have not been includes as DQI.

Table 8.3.5.2 Data Quality Indicators and Target Criteria

Completeness			
Field Considerations	***Target Criteria***	***Laboratory Considerations***	***Target Criteria***
Experienced sampling team used	Yes	Complete sample receipt advice and chain of custody attached	Yes
Sampling devices and equipment set out in sampling plan were used (refer **Section 8.3.7.2**).	Yes	Critical samples identified in sampling plan, analysed	Yes
Critical locations in sampling plan, sampled (refer **Section 8.3.7.2**).	Yes	Analysis undertaken addresses COPC in sampling plan (refer **Section 8.3.7.6**)	Yes
Critical samples in sampling plan, collected (refer **Section 8.3.7.2**).	Yes	Analytical methods reported in laboratory documentation and appropriate limit of reporting used	Yes
Completed field and calibration logs attached	Yes	Sample holding times met (refer **Section 8.3.7.7**)	Yes
Completed chain of custody attached	Yes		

Comparability			
Field Considerations	***Target Criteria***	***Laboratory Considerations***	***Target Criteria***
Same sampling team used for all work.	Yes	Same laboratory used for all analysis (refer **Section 8.3.7.5**).	Yes
Weather conditions suitable for sampling.	Yes	Comparable methods if different laboratories used (refer **Section 8.3.7.7**).	Yes
Same sample types collected and preserved in same way (refer **Section 8.3.7.2**).	Yes	Comparable limits of reporting if different laboratories used.	Yes
Relevant samples stored in insulated containers and chilled (refer **Section 8.3.7.4**).	Yes	Comparable units of measure if different laboratories have been used (refer **Section 8.3.7.7**).	Yes

Representativeness			
Field Considerations	***Target Criteria***	***Laboratory Considerations***	***Target Criteria***
Media identified in sampling plan, sampled (refer **Section 8.3.7.2**).	Yes	Samples identified in sampling plan, analysed.	Yes
Samples required by sampling plan, collected (refer **Section 8.3.7.2**).	Yes		

8.3.5.3 If / Then Statements

If the SCA field and laboratory analytical dataset meets the DQI target assessment criteria, then the data may be considered adequately complete, comparable, representative, precise and unbiased, for the purpose of addressing the decisions / goals of this project as set out in **Section 8.3.2**.

If the SCA field and laboratory analytical dataset does not meet the DQI target assessment criteria, then additional data may need to be collected to address gaps identified in the data.

If the SCA field and laboratory analytical results are within the adopted land contamination assessment criteria (refer **Section 18.3**), then it may be assessed that identified land contamination at the site does not present an unacceptable human health exposure risk.

If the SCA field and laboratory analytical results are outside adopted land contamination assessment criteria (refer **Section 18.3**), then it may be assessed that identified land contamination at the site presents an unacceptable human health exposure risk, or that supplementary site specific qualitative / quantitative risk assessment may be required.

If the statistical assessment of the relevant previous contamination assessment and SCA data indicate that the arithmetic average concentration of a specified contaminant, is unlikely to exceed an adopted screening criterion, then it may be assessed that the identified land contamination does not present an unacceptable human health exposure risk.

8.3.6 SCA Step 6: Performance and Acceptance Criteria

8.3.6.1 If / Then Decisions

There are two types of decision error:

- Sampling errors – these occur when the sampling program does not adequately detect variability of a contaminant from point to point across a site. That is, the samples collected are not representative of site conditions (e.g. an appropriate number of representative samples have not been collected from each stratum, to account for estimated variability in that contaminant); and
- Measurement errors - these occur during sample collection, preparation, analysis and reduction of data.

During land contamination assessment, these errors can result in either:

- a Type I error, where land contamination human health exposure risks are considered to be acceptable, when they are not acceptable; or
- a Type II error, where land contamination human health exposure risks are considered to be unacceptable, when they are acceptable.

For decision rules to be sound, they should be designed to mitigate risk of decision errors occurring. The risk of decision error on this project will be mitigated by:

- Ensuring fieldwork is undertaken by suitably experienced field staff and sub-contractors, with reference to the DQO adopted for this project;
- Ensuring laboratory analysis is undertaken by NATA accredited laboratories; and
- Ensuring assessment of field and laboratory analytical data is undertaken by suitably experienced environmental consultants and/or outsourcing assessment to technical experts (if warranted).

8.3.7 SCA Step 7: Develop the plan for obtaining data

8.3.7.1 Sampling Point Densities and Locations

Section 5.1 in NSW EPA (2022) provides guidance regarding probabilistic sampling and judgement sampling.

A probabilistic sampling design uses random selection that when properly applied, results in unbiased and independent data. For an optimal design, using probabilistic sampling, an accurate CSM is required, including a clear definition of the population to be sampled. Systematic grid based sampling is a probabilistic method.

A judgemental sampling design requires decisions on where and/or when to collect samples, and relies on good site histories and/or site features being clear and distinct. The method can be efficient for assessing areas of worse case impacts and can be useful where site history is inadequate or the features of concern are obscured or not discernible. Targeted sampling is a judgemental method. Section 6.2.1 in NEPC (2013b) advises that judgemental sampling and the selection of samples (number, location, timing, etc) should be based on knowledge of the site and professional judgement. In these instances, sampling would be expected to be localised to known or potentially contaminated areas identified from knowledge of the site either from the site history or an earlier phase of laned contamination assessment. Judgemental sampling can be used to investigate sub-surface contamination issues in site assessment.

Stratified sampling comprises a combination of systematic and judgemental sampling, for sites with different uses, features and complex contaminant distributions, where a site is divided into various non-overlapping sub areas, according to geological and geographical features. Each sub area can then be treated as an individual decision area with different sampling patterns and sampling densities applied. For example, on area might require targeted sampling while a neighbouring one might need systematic sampling.

A stratified sampling strategy requires reliable prior knowledge of the site. NEPC (2013b) notes that stratified sampling can provide

- potential for achieving greater precision in estimates of the mean and variance where the measurement of interest is strongly correlated with the variable used to define the strata; and
- calculation of reliable estimates for subgroups of special interest.

Table 2 in NSW EPA (2022) provides guidance on minimum sampling point densities required for characterising a site, based on detecting circular hot spots, by using a systematic sampling pattern.

Section 4.1 and Table 1 of WA DOH (2009) provides guidance on asbestos in soil sampling densities (in-situ and stockpiles), relative to the likelihood of asbestos being present on the site, based on assessment of site history.

The scope of this project has included collection of data that provides an understanding of:

- site history;
- the locations of potentially contaminated areas;
- the identified COPC;
- laydown mechanisms for COPC in each AEC;
- the likely lateral and vertical extent of potential contamination in each AEC; and
- constraints on site which may restrict the use of certain sampling techniques.

On that basis, it is considered reasonable to adopt a judgemental grid-based sampling pattern using the sample point densities set out in **Table 8.3.7.1** and presented in **Figure 8.**

Table 8.3.7.1 SCA Works Sampling Point Densities and Locations

ID	AEC	Sampling Point ID	Method	Target Depth (m bgl)
AEC01	Site footprint (920m^2 and ~1m thick)	TP09-TP16	Test pit	1m, 0.3m into natural, or practical refusal

8.3.7.2 Sampling Methods

8.3.7.2.1 Soils

Soil samples will be collected from each relevant sampling point, at the surface at 0.0-0.1m or 0.0-0.15m, unless there is evidence of a thin surficial layer of contamination. Samples will then be collected at regular intervals thereafter (typically at depth intervals of no more than 0.5m), or where there is a change in lithology, or where there is visual/olfactory evidence of potential contamination. Samples will also typically be collected beneath the point where fill meets the underlying natural soil.

Samples requiring asbestos gravimetric screening for asbestos containing material (ACM) and fibrous asbestos (FA) will be 10L in volume, and will be collected and screened with reference to Table 5 in WA DOH (2009), including but not limited to, separate samples for each stratum of fill material encountered during in-situ soil sampling.

Samples requiring asbestos fines (AF) and fibrous asbestos (FA) analysis, will be collected as separate samples to the aforementioned 10L bulk samples.

The following will be considered when sampling soils for the purpose of assessing ambient background concentrations of metals in soils:

- whether the background sampling area consists of similar soil types as the site or area of environmental concern (AEC); and
- collection and comparison of samples with soils and/or sediments from the same soil horizon layer.

Samples will be submitted to a NATA accredited laboratory for analysis.

8.3.7.3 Decontamination

Non-disposable sampling equipment will be decontaminated using the procedures set out in **Section 18.7** of this report.

8.3.7.4 Sample Identification, Handling, Storage and Transport

Soil samples will be identified, handled, stored and transported using the procedures set out in **Section 18.7** of this report.

8.3.7.5 Selection of Laboratory

The analytical laboratories used for this project will reputable industry recognised environmental laboratories, that are NATA accredited for the analytical methods used.

8.3.7.6 Scheduling of Laboratory Analysis

Collected samples will be scheduled for laboratory analysis based on:

- The COPC identified for the AEC the sample was collected from;
- Observations made of the sample when collected (including staining, odour, presence of anthropogenic materials, and presence of potential asbestos containing materials);

The laboratory analytical schedule (including upper limiting sample quantities) adopted for this project, is set out in **Table 8.3.7.6**.

Table 8.3.7.6 Schedule of Laboratory Analysis

ID	AEC	Sampling Point ID	Asbestos (0.001%)
AEC01	Site footprint	TP09-TP16	8

8.3.7.7 Analytical Methods, Limits of Reporting and Holding Times

The analytical methods, limits of reporting and sample holding times adopted for this project, are set out in **Table 18.7.7.**

9 Fieldwork

9.1 Soils

9.1.1 Sampling

Soil sampling works were undertaken on 22nd January 2025 by a suitably experienced Alliance environmental consultant (James Petsas).

These works included:

- Undertaking a survey of each sampling point by a service locating contractor for buried metallic services;
- Excavation of a strip trench, which included sampling points (TP09 to TP12) using a 3T tracked hydraulic excavator;
- Excavation of four test pits (TP13 to TP16) using a 3T track mounted hydraulic excavator; and
- Air monitoring for respirable fibres.

Soil samples were collected at each sampling point, at the surface and at regular intervals thereafter, or at depths where visual or olfactory evidence of contamination was encountered.

Samples were collected either directly from excavated soils, or from the centre of soils while still in the excavator bucket (to avoid cross contamination), as grab samples, using a fresh pair of nitrile gloves.

A grid based walkover of the surface of the site, was undertaken for the purpose of assessing the presence of visible asbestos in surface soils.

A 10L bulk sample was collected at each test pit sampling point, for each metre (or part thereof) of inferred fill material encountered. Sub samples of 500ml volume were taken as separate samples to 10L bulk samples.

Samples were placed in suitable laboratory prepared containers and labelled.

Test pits were backfilled with excavated soils.

Sampling point locations were confirmed on a site plan. The sampling point location plan is presented in **Figure 6.**

9.1.2 Site Specific Geology

Observations made of the soils encountered during intrusive investigation works on site, were recorded on relevant field logs. A copy of those logs is presented in **Appendix F**.

A summary of those observations, in the context of subsurface conditions at the site, is presented in **Table 9.1.2.**

Image 9.1.1.1 Photograph of excavator and strip trench.

Image 9.1.1.2 Photograph of air monitor set up.

Image 9.1.1.3 Photograph of test pit.

Table 9.1.2. Site Specific Geology

Unit	Description	Depth (m bgs)
Fill	Silty SAND, fine to medium, dark brown, with clay, trace gravel of glass, metal and plastic, with trace rootlets, dry.	0.4-0.6
Natural	Silty CLAY, low to medium plasticity, pale brown with slight orange mottling, dry.	0.6-0.9

Image 9.1.2.1 Photograph of fill soils from TP12.

Image 9.1.2.2 Photograph of fill and natural profile from TP16.

9.1.3 Soil Staining and Odours

Visual evidence of staining was not observed in the soil samples collected.

Olfactory evidence of odours was not detected in the soil samples collected.

9.1.4 Asbestos Containing Materials and Fibrous Asbestos

Evidence of visual asbestos in surface soils was not observed a grid based walkover of the site.

The 10L bulk soil samples were weighed and the weights recorded (to inform assessment of site specific soil densities). The samples were then screened by spreading the material on contrasting plastic. Potential asbestos containing materials (ACM) that would not pass through a 7mm x 7mm sieve that were found during screening, were weighed. The material weights were recorded on the relevant sampling point log, and the potential ACM placed in separate zip lock bags.

Visual evidence of potential asbestos containing materials (ACM) was not observed in the samples collected.

Image 9.1.4.1 Photograph of gravimetric assessment undertaken at TP12.

Image 9.1.4.2 Photograph of gravimetric assessment undertaken at TP09.

10 Laboratory Analysis

The collected samples were transported to the analytical laboratory using chain of custody (COC) protocols. A selection of those samples were scheduled for laboratory analysis, taking into consideration the laboratory analytical schedule presented in **Table 18.7.6**, observations made in the field, and the results of field and headspace screening.

A copy of the COC, sample receipts and certificates of analysis, is presented in **Appendix G**.

The relevant laboratory analytical results were tabulated and presented in the attached **Table LR1,** to allow comparison with assessment criteria adopted for this project.

11 Data Quality Indicator (DQI) Assessment

In order to assess the quality of the field and laboratory analytical data collected for this project, that data was compared against the data quality indicators (DQI) established for this project (refer **Section 18.5.2**).

The results of that comparison is presented in **Appendix F**.

The DQI comparison results indicate that the field and laboratory data are adequately complete, comparable, representative, precise and unbiased (accurate), with in the context and objectives of this project.

12 Site Characterisation Discussion

12.1 Exposure Pathways

12.1.1 Human Health

12.1.1.1 Fibrous Asbestos / Asbestos Fines

The concentrations of FA and AF detected in the soil samples analysed within the SCA, were less than the adopted health screening level of 0.001% w/w.

Management and/or remediation of soils at TP03 and the surrounding area is considered warranted.

13 Revised Conceptual Site Model

Consistent with guidance provided in Section 4.2 of NEPC (2013b), the conceptual site model (CSM) presented in **Section 6.6** has reviewed to reflect the data collected during this project, and subsequent assessment of that data against the screening criteria adopted for this project.

An updated CSM is presented in **Table 13**. The locations of the AEC considered in the CSM, are presented in **Figure 7.**

Table 13 Source, Pathway and Receptor Links

ID	AEC	Land Contaminating Activity (Source)	COPC	Exposure Pathway	Receptor	Outcome
AEC01	Site footprint (920m^2 and ~1m thick)	Uncontrolled filling	Asbestos fines	Inhalation (asbestos)	Commercial workers Intrusive maintenance workers	The field and laboratory analytical data for site soils were less or equal to the adopted Tier 1 screening criteria, with the exception of fill soils within TP03. The extent of fill soils will be assessed under a new AEC (AEC01a).
AEC01a	Uncontrolled filling around TP03 (75m^2 and ~0.6m thick)	Uncontrolled filling	Asbestos fines	Inhalation (asbestos)	Commercial workers Intrusive maintenance workers	The field and laboratory analytical data for site soils were greater than the adopted Tier 1 screening criteria. Further assessment / management and or remediation is required.

14 Remediation Objectives and Criteria

CRC CARE (2019c) defines a remediation objective as a site specific objective that relates solely to the reduction or control of unacceptable risks associated with one or more pollutant linkage.

The remediation objective is to remediate identified land contamination exposure risks to levels that do not present an unacceptable human health or ecological exposure risk, based on the proposed land use scenario for the site, which comprises:

- Commercial / industrial such as shops, offices, factories and industrial sites.

Section 3.2.5.3 of NEPC (2013i) advises that:

- although many commercial premises welcome children on an intermittent basis, it is unlikely that children visit the majority of workplaces frequently;
- in commercial premises where children are regular visitors, such as shopping centres, both the duration and frequency of child exposures are generally lower than that of a full-time employee.

Alliance considers an ice-skating rink to be comparable to a shopping centre, in the context of land use scenarios, for the purpose of land contamination assessment.

It is noted that the client's preferred outcome at the completion of remedial works, is to not have:

- a covenant registered on the land title;
- a notation on a planning certificate for the site; and
- an environmental management plan (EMP) for the site.

And that the clients preferred remedial outcome is excavation and offsite disposal.

It is acknowledged that Section 2.1.2 of NEPC (2013a) advises that:

- investigation and screening levels are not clean up levels or response levels nor are they desirable soil or water quality criteria; and
- the use of investigation and screening levels as default remediation criteria may result in unnecessary remediation and increased development costs, unnecessary disturbance to the site and local environment, and potential waste of landfill space.

However, in practice, the investigation and screening levels in NEPC (2013a) are often used as clean up / remediation targets, because the assumptions on which those levels are based, can have general applicability for protection of certain land uses and there may not be a reason for varying from them.

The remediation assessment criteria that have been adopted for this project, and the basis/source of those criteria, are set out in **Table 18.3** of this RAP.

15 Remediation Extent and Options

15.1 Inferred Extent

The inferred extent of identified remediation at the site are set out in **Table 15.1** and **Figure 7**.

Table 15.1 Inferred Extent of Remediation

ID	Remediation Area	Contamination Risk	Indicative Volume (Insitu)	Assumptions
AEC01a	Fill materials impacted by asbestos fines around TP03. (75m^2 and ~0.6m thick)	Asbestos fines	~45m^3	(75m^2 and ~0.6m thick)

It is noted that these inferred extents are based on a limited set of data. One or more of the extents may be subject to change, as a result of:

- Latent subsurface conditions.

15.2 Options Assessment

15.2.1 Preamble

When assessing management of contamination, the preferred hierarchy[6] of options for site clean-up and/or management should be considered, which includes:

- 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 the soil is returned to the site; or

if the above are not practicable;

- consolidation and isolation of the soil by on-site 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.

Section 4.10 of SEPP (2021) states that a consenting authority cannot refuse development for category 1 remediation work unless the authority is satisfied that there would be a more significant risk to human health or some other aspect of the environment from carrying out of the work, than there would be from use of the concerned land (in the absence of any work) for any purpose for which it may be lawfully used.

[6] NEPC 2013, 'National Environment Protection (Assessment of Site Contamination) Measure 1999, Site Contamination Policy Framework, Section 6' dated May 2013

The waste hierarchy is a set of priorities for the efficient use of resources. This underpins the objectives of the Waste Avoidance and Resource Recovery (WARR) Act 2001. NSW EPA advises that:

- the highest priority in that hierarchy is avoidance, including action to reduce the amount of waste generated; and
- the lowest priority in that hierarchy is disposal.

Onsite containment of asbestos in soils, avoids the need to generate asbestos waste, which is consistent with the objectives of the WARR Act, and achieves the highest priority of the hierarchy but does not fit with the clients preference. Excavation and offsite disposal does not achieve the highest priority of the hierarchy, however fits with the clients preference.

AS ISO 18504:2022 Soil quality - Sustainable remediation, is an identical adoption of the international standard on sustainable remediation (ISO 18504:2017). Sustainable remediation is considered to be the elimination and/or control of unacceptable risks in a safe and timely manner while optimising the environmental, social, and economic value of the work. The onsite treatment of asbestos in soil remedial strategy set out in this RAP, provides for:

- the elimination and/or control of unacceptable asbestos in soil exposure risks;
- the elimination of environmental impact associated with unnecessary disposal of asbestos impacted soils to landfill;
- the elimination of social impact associated with unnecessary truck movements through the community from transporting asbestos impacted soils offsite; and
- optimising economic investment efficiencies obtained by utilising cost effective strategies as a means of managing legacy land contamination risks.

Alliance notes NSW EPA's draft position for management of asbestos contaminated sites (June 2023) has been re-reviewed (1 October 2024), and NSW EPA has provided general information with regards to regulatory framework and clarifications on permissibility of certain remedial approaches while it explores any changes. The general information provided on includes remediating asbestos contaminated soils, advises that:

- remediation of site contaminated with asbestos are regulated under the Contaminated Land Management Act 1997 (the CLM Act) and/or planning framework (e.g. SEPP Resilience and Hazard (2021)), depending on the significance of the contamination and how it can be managed;
- the purpose of remediating asbestos-contaminated soils is to remove, reduce or contain the asbestos so that it does not pose a risk to human health or the environment for the current, approved or proposed land use;
- should be risk based and take a weight of evidence approach, based on the site's history and CSM developed for the site; and
- once remediation is complete, the remedial works must be independently validated to ensure that the management objectives have been achieved, including whether the site is suitable for the current, approved, or proposed use.

The client has advised Alliance that its preferred remediation methodology for AEC01a is removal of asbestos fines impacted soils to an approved facility for disposal.

15.2.2 Adopted Criterion

For the purpose of assessing the suitability of remediation options considered appropriate for this project, Alliance has adopted a matrix that facilitates a qualitative score being assessed for each option being considered. That assessment matrix is presented in **Table 15.2.2**.

Table 15.2.2 Qualitative Remediation Options Assessment Criteria Matrix

ID	Performance Ranking Guidance and Scoring				
Criterion	**0**	**1**	**2**	**3**	**4**
Applicability	Not Applicable	←	→		Highly applicable
Technical Feasibility	Unfeasible	←	→		Highly feasible
Effectiveness	Not effective for desired outcome	←	→		Highly effective for desired outcome
Sustainability[7]	Unsustainable	←	→		Highly sustainable
Stakeholder Acceptance	Not acceptable to EPA, Council or local community	←	→		Highly acceptable to EPA, Council or local community
Duration	Long term relative to redevelopment timeframe	←	→		Short term relative to redevelopment timeframe
Cost	Likely highest cost	←	→		Likely lowest cost

15.2.3 Remedial Options Selection and Assessment

For the purpose of identifying potential remediation options for the site, consideration has been given to guidance in Section 3 of CRC CARE (2019d). Options considered potentially appropriate, based on the inferred extent of remediation and nature of the contamination set out in **Section 15.1** of this RAP, are presented in **Table 15.2.3.1**. A qualitative assessment of each relevant remediation option against the criterion adopted for this process, is also presented in **Table 15.2.3.1**.

Table 15.2.3.1 Remedial Option Assessment for ACM in AEC01a

Criterion	Excavate and Dispose	In-situ Containment	Onsite Treatment	Comments
Applicability	4	0	1	Excavation and disposal integrates well with proposed development work. Client does not want a containment cell within the proposed development. Friable impacted soils cannot be treated on site and would not fit the clients specified remediation option.

[7] In context of remediation, this is considered to refer to achieving an acceptable balance between the impacts of undertaking remediation activities and the benefits of those activities will deliver in terms of the environmental, economic and social indicators relevant to the site.

Table 15.2.3.1 Remedial Option Assessment for ACM in AEC01a

Criterion	Excavate and Dispose	In-situ Containment	Onsite Treatment	Comments
Technical Feasibility	4	2	1	Excavation and disposal methods readily available. Containment creates constraints for construction and related long term site management. Onsite treatment not feasible due to asbestos fines
Effectiveness	4	2	0	Excavation and disposal is highly effective - unacceptable risks removed from site. Containment achieved by removing pathway between source and receptor. Onsite treatment not feasible due to asbestos fines
Sustainability	1	3	0	Excavation and disposal not consistent with sustainability principles. Containment requires long term passive maintenance and constraints on land use. Onsite treatment not feasible due to asbestos fines
Stakeholder Acceptance	3	1	0	Excavation and disposal removes risk from site, however, major site disturbance and traffic impacts considered not sustainable by some stakeholders. Clients preferred methodology. Containment may not be consistent with local Council contaminated land policy. Onsite treatment not feasible due to asbestos fines
Duration	4	2	0	Offsite disposal comparatively fast, remediation unlikely to adversely impact project timeframe. Containment design, approval and construction likely to impact project timeframe. Onsite treatment not feasible due to asbestos fines
Cost	1	3	0	Disposal costs are significantly high. Containment short term costs acceptable, but long term cost (management and future land value) may be unacceptable. Onsite treatment not feasible due to asbestos fines
Score	**21**	**13**	**0**	

16 Preferred Remedial Options

Based on the current understanding of the inferred extent of unacceptable land contamination risks, the proposed land use scenario for the site, and the client's preferred remedial outcomes for the site, and the results of the options assessment presented in **Section 15.2**, the preferred remedial options for the site are presented in **Table 11.1**.

It is noted that the preferred remedial options are based on a qualitative assessment of a limited set of data. One or more of the preferred options may be subject to change, as a result of:

- Latent subsurface conditions, including unexpected finds;

It is also noted that the results of the supplementary assessment may also require a change to the preferred remedial options. Should this scenario arise, that change would be presented in either an addendum to this RAP, or in the site remediation and validation report (SRVR) prepared at the completion of the site remedial works.

Table 11.1 Preferred remedial options

AEC	Contamination Risk	Preferred Remedial Option and Method
AEC01a	Fill materials impacted by asbestos fines around TP03. ((75m^2 and ~0.6m thick)	Excavate soils and dispose to suitably licensed waste receiving facility, with a waste classification. Validation of the residual excavation will be undertaken in accordance with **Section 18**.

17 Remedial Strategy

17.1 Schedule of Remediation

Remedial works are expected to take three to four weeks to complete. This timeframe will be refined following appointment of a remediation contractor.

17.2 Notifications and Approvals

A notification of intent to undertake remedial works will be submitted to the relevant planning authority, 30 days prior to the date those remedial works (excluding any supplementary contamination assessment works where proposed) are intended to commence.

Alliance understands that remedial works classified as Category 2 under State Environmental Planning Policy (SEPP) Hazards and Resilience (2021), do not require development consent. However, in the event that the proposed remedial works trigger the Category 1 criteria in the SEPP, including but not limited to issues related to:

- designated development under the Environmental Planning and Assessment Regulation;
- critical habitat under the Threatened Species Conservation Act;
- the works having a significant effect on a critical habitat, or threatened species, populations or ecological communities;
- the works being located in areas of environmental significance;
- requiring consent under another SEPP or a regional environmental plan (REP); or
- remediation work being carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated (or if the land is within the unincorporated area, the Minister),

then development consent for the remedial works may be required.

It is anticipated that remediation works that may plausibly be required on the site, would be classified as Category 2. Advice on this matter will be sought from a suitably experienced planner, with a decision made on the Category 2 classification by the relevant planning consent authority.

Alliance notes NSW EPA's general information issued on 1 October 2024 for asbestos contaminated sites, presented at:

- https://www.epa.nsw.gov.au/your-environment/contaminated-land/other-contamination-issues/managing-asbestos-in-and-on-land/.

That information advises that:

- remediation of asbestos in soil needs to be risk-based and take a weight of evidence approach, based on a site's history and CSM;
- the remediation objective and process is to be documented in a remedial action plan, prepared by suitably qualified and experienced contaminated land consultant; and

- the remediation is to be independently validated to ensure that the remediation objective has been achieved, including whether the site is suitable for the current, approved or proposed use.

Alliance considers that this RAP provides a framework to address the intent of that NSW EPA advice.

The following information will be provided to the relevant planning authority, with the notice of intent to undertake remedial works:

- a copy of previous contamination assessment reports;
- a copy of this RAP;
- the contact details of the party responsible for ensuring remedial works comply with relevant regulatory requirements; and
- the contact details of the remediation contractor.

Occupants of properties adjoining the site and located immediately across the road from the site, will be provided with a notification of intent to undertake remedial works on the site, in accordance with **Section 20.3** of this RAP.

Development consent or a construction certificate will be obtained (if required) from the relevant planning authority for demolition, excavation and/or shoring works.

Demolition works (if required) will be undertaken by a contractor holding an appropriate SafeWork NSW demolition licence. That licence will hold a chemical endorsement, in the event that demolition works include an underground and/or aboveground storage tank.

While considered unlikely in the context of this project:

- A water access licence will be obtained (if required) from Water NSW, in the event remediation works requires water to be taken at specified times, rates and circumstances from specified areas or locations.

- A water supply work and use approval will be obtained (if required) from Water NSW, in the event remediation works requires construction and use of a specific water supply at a specified location. Water supply works may include pumps, bores, spear points and wells.

Asbestos removal works will be notified to SafeWork NSW by the remediation contractor. The asbestos removal works will be undertaken by a contractor that will hold a:

- Class A licence for removal of friable asbestos / asbestos fines.

Within 30 days of completion of all remediation and validation works, a notice of completion of the remedial works will be submitted to the relevant planning authority.

17.3 Structural Stability

The stability of structures (including, but not necessarily limited to footings, walls, buildings and roads), which may be impacted by the proposed remedial works, will be assessed by a suitably experienced structural consultant before commencing remedial works. Recommendations made by the structural consultant will be incorporated by the remediation contractor, into the execution of all relevant site works.

17.4 Demolition Works

Identified hazardous materials is not likely to be required give the lack of buildings on site. However, if during redevelopment works, any hazardous materials are identified within the ground associated with fill, then they will be removed from site, and a clearance certificate obtained from a licensed asbestos assessor and/or competent person, prior to commencing demolition of the structures. The clearance certificate will be prepared with reference to guidance provided in Appendix D of SafeWork NSW (2022).

The remediation contractor will retain records of the transport and disposal of demolition wastes (including hazardous materials), removed from the site.

17.5 Remedial Works

The preferred remedial options (and associated methodologies) to be adopted for each of the identified AEC or potential contamination risks, are presented in **Section 16** of this RAP, and any addenda prepared for this RAP.

Remedial works will be undertaken by the remediation contractor with guidance provided by the appointed environmental consultant. The environmental consultant will assist the remediation contractor in setting out the inferred extents of remediation required, based on refined remedial extents set out in the supplementary contamination assessment report referred to in **Section 10**, and any subsequent addenda prepared for this RAP. The environmental consultant will provide guidance to the remediation contractor on:

- where to extend remedial works beyond the inferred extent (if observations indicate a need for ‘chasing out’ additional contamination); and
- when to stop remedial works, to allow validation works to be undertaken.

The remediation contractor will be responsible for:

- Coordinating right of way access through third party properties (as required) with the site owner and owners/tenants of third party properties;
- Site establishment, including stabilising of site access entry/exit points;
- Provision of worker amenities on site;
- Establishment of sediment and erosion controls;
- Establishing soil / sediment treatment areas, which may require localised minor earthworks to create cleared and ‘flat’ treatment pads;
- Mixing treated material back into onsite soils;
- Disposal of wastes to appropriately licensed facilities; and
- Retaining records of the transport and disposal of all wastes generated during remedial works.

17.6 Unexpected Finds, Unsuccessful Remedial Strategies and Contingency Plans

There is a degree of uncertainty inherent in site assessment and remediation works. Based on the site history information made available to Alliance prior to preparing this RAP, it is considered the scenarios identified in **Table 17.6** could occur during remedial works.

Contingency plans and protocols to be implemented, should those scenarios arise, are also presented in **Table 17.6**.

Table 17.6 Unexpected Finds, Unsuccessful Remedial Strategies and Contingency Plans

Unexpected Find Scenario / Unsuccessful Remedial Strategy	Contingency Plan
Change to proposed development design	Cease remedial works. Assess the change to proposed development design and note any deviations from the original plan. Assess the potential that these deviations may impact the remedial works/outcome, and if they are likely to adversely impact the remedial works/outcome, undertake the following: o Prepare revisions to the remedial design documents (if required); and o Prepare an addendum to the remediation and/or validation strategy in the RAP (if required). If the deviations are not likely to impact the remedial works/outcome, continue with remedial works as per this RAP.
Potential asbestos containing materials encountered beyond the inferred extent of remediation.	Cease remedial works. Consider undertaking intrusive soil investigations into and around the potential asbestos identified beyond the inferred remedial extent, and assess whether the asbestos is bonded and/or friable. Assess whether the asbestos encountered still presents an unacceptable human health exposure risk. Submit notification to SafeWork NSW for asbestos removal works (if not already addressed in an existing notification). Prepare an addendum to the remediation and/or validation strategy in the RAP. Remediate the unexpected contamination. Undertake validation of the remedial works.
Unexpected buried contamination or underground structures encountered during remedial works (e.g. buried waste, underground storage tank, underground sump/pit).	Cease remedial works. Consider undertaking intrusive soil investigations into and around the unexpected find, to assess the potential nature and extent of the contamination / structure. Consider undertaking groundwater assessment works, if the potential nature and extent of the contamination / structures suggest a risk to groundwater. Assess whether the contamination encountered presents an unacceptable exposure risk to identified receptors. Prepare an addendum to the remediation and/or validation strategy in the RAP (if required), pending the outcomes of the soil and/or groundwater assessment works. Remediate the unexpected contamination. Undertake validation of the remedial works.

17.7 Material Importation and Backfilling of Remedial Excavations

Should backfilling of remedial excavations be required, then backfill material being imported onto site will be lawful and will be limited to:

- Virgin excavated natural material (VENM);
- Excavated natural material (ENM); and

- Other materials that:
    - have been certified as compliant with a NSW EPA issued resource recovery exemption and the placement on the site is within the constraints of the resource recovery exemption; and
    - do not present an unacceptable human health or ecological exposure risk, in the context of the proposed land use scenario.

Material proposed for importing will be compatible with existing soil characteristics for site drainage purposes. Nominating engineering properties (compaction, density, moisture content) is not within the scope of this RAP and will be specified by others.

Certification of VENM, ENM or other approved resource recovery material, will be reviewed by the environmental consultant before the remediation contractor commences importing the material.

The remediation contractor will be responsible for:

- Inspecting every load of imported material for consistency with the material described in the relevant certification, including that the material is free of anthropogenic materials, odours or staining.
- Maintaining a record of inspection of each load; and
- Maintaining detailed records of all material imported to site, including details of the supplier/s, source of the material, quantity of the material, importing vehicle registration numbers, and dates/times the material is received on site, and placement location of imported material.

18 Site Validation Data Quality Objectives (DQO)

Appendix B in NEPC (2013b) provides guidance on the data quality objective (DQO) process, which is a seven step iterative planning approach that can be used to define the type, quantity and quality of data needed to inform decisions relating to land contamination risks at the site.

18.1 Step 1: State the problem

The reason the project is being undertaken, is set out in **Section 1.1** of this report.

The objective of this project is set out in **Section 1.2** of this report.

The project team and technical support experts identified for the project include the Alliance project director, Alliance project manager, Alliance field staff and Alliance's subcontractors.

The design and undertaking of this project will be constrained by the client's financial and time budgets.

The regulatory authorities associated with this project include NSW EPA, the local planning authority, and SafeWork NSW.

18.2 Step 2: Identify the decision / goal of the study

The decisions that need to be made during this project, to address the project objectives, include:

- Is the data collected for the project, suitable for assessing land contamination exposure risks?
- Do the detected concentrations of contaminants of potential concern identified in the CSM, present an unacceptable exposure risk to the receptors identified in the CSM, based on the proposed land use scenario?
- Has the remediation objective been achieved?
- Is the site suitable, in the context of land contamination, for the proposed land use scenario?

18.3 Step 3: Identify the information inputs

The information inputs required to make the decisions for the project set out in **Section 18.2**, include:

- Data obtained during the site history review, site walkover and remediation works observations;
- Records produced by the remediation contractor and other relevant 3rd parties, during the undertaking of remediation works;
- Identification of sample media that needs to be collected, as set out in **Section 18.7**;
- Parameters that will be measured in each relevant sample, as set out in **Section 18.7**;
- The analytical methods required for each identified COPC, so that assessment can be made relative to adopted site criteria. These are set out in **Section 18.7** of this report; and

- The site criteria for the media of concern. These criteria are set out in **Table 18.3** and will be adopted based on the proposed land use scenario[8], identified receptors, and site specific soil and groundwater conditions (where relevant).

Table 18.3 Adopted Remediation Assessment Screening Criteria

Exposure Pathway	Land Use Scenario[9]	Criteria Reference
Human health (asbestos)	Commercial / Industrial D	Table 7 in NEPC (2013a)[10]

18.4 Step 4: Define the boundaries of the study

The spatial extent of the project will be limited to:

- The boundaries of the site as set out in **Section 2**; and
- Physical constraints or infrastructure on site or on land adjacent to the site, that prevents safe and reasonable access for project team members and/or typical and readily available equipment used for projects of this nature.

The scale of the decisions required (as set out in **Section 18.2**) will be based on the boundaries of the site set out in **Section 2**.

The vertical and lateral extents of validation works will be limited to the extents of remediation works undertaken on relevant AECs identified in the CSM (refer **Section 6.6**), which are likely to be:

- The inferred vertical extent of AEC01a, likely to be~0.4 to 0.6m depth bgl; and
- The inferred lateral boundaries of each identified AEC01a.

The time and budget constraints of this project will be as per those set out in the contract (and any subsequent variations to that contract) between the client and Alliance.

The temporal boundaries of the project will include:

- Availability of project team members (including subcontractors and subconsultants) to collect and assess relevant project data;
- The availability of site access to undertake fieldwork; and
- Meteorological conditions including heat, cold, wind and rain, which may constrain undertaking of fieldwork, or may affect the quality of the data being collected.

18.5 Step 5: Develop the analytical approach

18.5.1 Analytical Laboratory Quality Assurance and Quality Control

The primary analytical laboratory will:

- be NATA accredited for the methods used; and

[8] The land use scenarios in Section 2.2 of NEPC (2013a) will be considered when adopting human health assessment criteria.
[9] Consideration will be given to soil type, soil texture, soil depth.
[10] A depth of up to 10cm below ground level is adopted to define 'surface soil'.

- use a quality assurance and quality control (QA/QC) program that will typically include analysis of method blanks, matrix spikes, surrogate spikes, laboratory control samples and laboratory duplicates.

The primary analytical laboratory will report on whether the analytical results of the QA/QC program are within the criteria set out in the laboratory's adopted data quality objectives.

18.5.2 Data Quality Indicators

A set of data quality indicators (DQI) will be adopted for assessing the completeness, comparability, representativeness, precision and bias (accuracy) of data collected during fieldwork, the analytical data produced by the laboratory. Each of these DQI, and associated target criteria are set out in **Table 18.5.2**.

It is noted that:

- Typical precision DQI related to field duplicates / triplicates, and relevant percentage differences (RPD) calculations; and

- Typical bias (accuracy) DQI relates to fieldwork spikes and blanks, and laboratory spike, blank and control sample analysis

Are not considered relevant to the assessment of asbestos in soils, and on that basis, have not been includes as DQI.

Table 18.5.2. Data Quality Indicators and Target Criteria

Completeness			
Field Considerations	***Target Criteria***	***Laboratory Considerations***	***Target Criteria***
Experienced sampling team used	Yes	Complete sample receipt advice and chain of custody attached	Yes
Sampling devices and equipment set out in sampling plan were used (refer **Section 18.7**).	Yes	Critical samples identified in sampling plan, analysed	Yes
Critical locations in sampling plan, sampled (refer **Section 18.7**).	Yes	Analysis undertaken addresses COPC in sampling plan (refer **Section 18.7**)	Yes
Critical samples in sampling plan, collected (refer **Section 18.7**).	Yes	Analytical methods reported in laboratory documentation and appropriate limit of reporting used	Yes
Completed field and calibration logs attached	Yes	Sample holding times met (refer **Section 18.7**)	Yes
Completed chain of custody attached	Yes		

Comparability			
Field Considerations	***Target Criteria***	***Laboratory Considerations***	***Target Criteria***

Table 18.5.2. Data Quality Indicators and Target Criteria

Same sampling team used for all work.	Yes	Same laboratory used for all analysis (refer **Section 18.7**).	Yes
Weather conditions suitable for sampling.	Yes	Comparable methods if different laboratories used (refer **Section 18.7**).	Yes
Same sample types collected and preserved in same way (refer **Section 18.7**).	Yes	Comparable limits of reporting if different laboratories used.	Yes
Relevant samples stored in insulated containers and chilled (refer **Section 18.7**).	Yes	Comparable units of measure if different laboratories have been used (refer **Section 18.7**).	Yes
Representativeness			
Field Considerations	***Target Criteria***	***Laboratory Considerations***	***Target Criteria***
Media identified in sampling plan, sampled (refer **Section 18.7**).	Yes	Samples identified in sampling plan, analysed.	Yes
Samples required by sampling plan, collected (refer **Section 18.7**).	Yes		

18.5.3 If / Then Statements

If the field and laboratory analytical dataset meets the DQI target assessment criteria, then the data may be considered adequately complete, comparable, representative, precise and unbiased, for the purpose of addressing the decisions / goals of this project as set out in **Section 18.2**.

If the field and laboratory analytical dataset does not meet the DQI target assessment criteria, then additional data may need to be collected to address gaps identified in the data.

If the field and laboratory analytical results are within the adopted land contamination assessment criteria (refer **Section 18.3**), then it may be assessed that the remediation objective has been achieved, and that the site does not present an unacceptable human health exposure risk, based on the adopted land use scenario.

If the field and laboratory analytical results are outside adopted land contamination assessment criteria (refer **Section 18.3**), then it may be assessed that the remediation objective has not been achieved and that identified land contamination at the site presents an unacceptable human health exposure risk, and that further contamination management / remediation work is required.

18.6 Step 6: Performance and Acceptance Criteria

18.6.1 If / The Decisions

There are two types of decision error:

- Sampling errors – these occur when the sampling program does not adequately detect variability of a contaminant from point to point across a site. That is, the samples collected are not representative of site conditions (e.g. an appropriate number of representative samples have not been collected from each stratum, to account for estimated variability in that contaminant); and

- Measurement errors - these occur during sample collection, preparation, analysis and reduction of data.

During land contamination assessment, these errors can result in either:

- a Type I error, where land contamination human health exposure risks are considered to be acceptable, when they are not acceptable; or
- a Type II error, where land contamination human health exposure risks are considered to be unacceptable, when they are acceptable.

For decision rules to be sound, they should be designed to mitigate risk of decision errors occurring. The risk of decision error on this project will be mitigated by:

- Ensuring fieldwork is undertaken by suitably experienced field staff and sub-contractors, with reference to the DQO adopted for this project;
- Ensuring laboratory analysis is undertaken by NATA accredited laboratories; and
- Ensuring assessment of field and laboratory analytical data is undertaken by suitably experienced environmental consultants and/or outsourcing assessment to technical experts (if warranted).

18.7 Step 7: Develop the plan for obtaining data

18.7.1 Sampling Point Densities and Locations

Section 5.5 in NSW EPA (2022) provides guidance regarding validation sampling.

Section 4.1 and Table 1 of WA DOH (2009) provides guidance on asbestos in soil sampling densities (in-situ and stockpiles), relative to the likelihood of asbestos being present on the site, based on assessment of site history.

The scope of this project has included collection of data that provides an understanding of:

- site history;
- the locations of potentially contaminated areas;
- the identified COPC;
- laydown mechanisms for COPC in each AEC;
- the likely lateral and vertical extent of potential contamination in each AEC; and
- constraints on site which may restrict the use of certain sampling techniques.

On that basis, it is considered reasonable to adopt a

- systematic grid based sampling pattern

using the preferred sampling point densities set out in **Table 18.7.1**.

Table 18.7.1 Preferred Validation Sampling Point Densities and Locations

ID	AEC	Contamination Risk	Preferred Validation Strategy
AEC01a	(75m^2 and ~0.6m thick)	Asbestos fines	A visual assessment of the residual remediation area and photographic record. Visual validation of excavation base and walls, and collection of: • one sample per 5m x 5m (25 m^2) of excavation base, minimum of two; and • one 10L sample and 500ml sample per five lineal metres of excavation wall, if greater than 0.1m for each relevant stratum, or per vertical metre of excavation depth, whichever is greater. Laboratory analysis of all samples for asbestos 500 ml (WA 0.001% w/w). Clearance certificate from an LAA.
-	Imported VENM for backfilling	Site specific	VENM to be validated using the procedures set out in https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material Visual assessment (by a suitably experienced person) of materials upon delivery to site to assess consistency with the material in the supply documentation, confirm free of anthropogenic indicators of contamination (based on professional judgement using criteria set out in **Table 18.3** for aesthetics risk) and are consistent with material description provided in the reviewed certification report. Refer to **Section 17.7** for non-conforming materials.
-	Imported ENM for backfilling	Refer The excavated natural material 2014 Order and Exemption	Quantity dependent – refer to The excavated natural material (ENM) resource recovery exemption. Gravimetric assessment of samples for bonded asbestos. Laboratory analysis of all samples as per Order and Exemption, and asbestos (0.001% w/w). Visual assessment (by a suitably experienced person) of materials upon delivery to site to assess consistency with the material in the supply documentation, confirm free of anthropogenic indicators of contamination (based on professional judgement using criteria set out in **Table 18.3** for aesthetics risk) and are consistent with material description provided in the reviewed certification report. Refer to **Section 17.7** for non-conforming materials.
-	Imported Other for backfilling	Refer relevant Order and Exemption	Quantity dependent – refer to the relevant resource recovery exemption. Gravimetric assessment of samples for bonded asbestos. Laboratory analysis of all samples as per Order and Exemption, and asbestos (0.001% w/w).

Table 18.7.1 Preferred Validation Sampling Point Densities and Locations

ID	AEC	Contamination Risk	Preferred Validation Strategy
			Visual assessment (by a suitably experienced person) of materials upon delivery to site to assess consistency with the material in the supply documentation, confirm free of anthropogenic indicators of contamination (based on professional judgement using criteria set out in **Table 18.3** for aesthetic risk) and are consistent with material description provided in the reviewed certification report. Refer to **Section 17.7** for non-conforming materials.
-	Imported landscaping / topsoil material	Asbestos (0.001% w/w), OCPs and metals (8)	Product supply documentation to be provided to the environmental consultant prior to import, including supplier certification required to assess imported landscaping materials are consistent with the relevant requirements of AS4419 (2003) and NSW EPA 2024 'Contaminated Mulch Management Plan' dated March 2024, ref: EPA2024P4500. Sampling to be undertaken with reference to Table 2, Table 3 and Table 4 of NSW EPA (2022). Gravimetric assessment of samples for bonded asbestos. Laboratory analysis of all samples, including asbestos (0.001% w/w). Visual assessment (by a suitably experienced person) of materials upon delivery to site to assess consistency with the material in the supply documentation and confirm free of anthropogenic indicators of contamination (based on professional judgement using criteria set out in **Table 18.3** for aesthetic risk). Refer to **Section 17.7** for non-conforming materials.

18.7.2 Sampling Methods

18.7.2.1 Soils

Soil samples will be collected from each relevant sampling point, at the surface at 0.0-0.1m or 0.0-0.15m, unless there is evidence of a thin surficial layer of contamination. Samples will then be collected at regular intervals thereafter (typically at depth intervals of no more than 0.5m), or where there is a change in lithology, or where there is visual/olfactory evidence of potential contamination. Samples will also typically be collected beneath the point where fill meets the underlying natural soil.

Samples collected from excavation bases and footprints, will typically be collected across a depth of 0.0-0.1m below the surface.

Samples collected from excavation walls will typically be collected across a profile 0.1 to 0.2m in thickness and will target suspect material based on visual and/or olfactory observations.

Samples requiring asbestos gravimetric screening will be 10L in volume, with sampling targeting suspect asbestos material or construction debris, and screened with reference to Table 5 in WA DOH (2009).

Samples requiring calculation of asbestos fines (AF) and fibrous asbestos (FA), with sampling targeting suspect asbestos material or construction debris, and collected as separate samples to the 10L bulk samples.

If olfactory or visual observations of remedial works, or headspace analysis of screening samples, indicate a potential for contamination to be present, then consideration will be given to collection of additional validation samples / data.

The location of collected validation sampling data will be recorded on a site plan.

Samples will be submitted to a NATA accredited laboratory for analysis.

18.7.3 Decontamination

Non-disposable sampling equipment will be decontaminated between sampling points to mitigate potential for cross contamination of samples. Decontamination will include the following procedure:

- Washing off the non-disposable sampling equipment with a solution of potable water and phosphate free detergent (e.g. Decon 90), noting that Decon 90 will not be used on equipment used for collection of samples that will be analysed for PFAS compounds;
- Rinsing the washed equipment with distilled or de-ionised water; and
- Air drying of the rinsed equipment.

18.7.4 Sample Identification, Handling, Storage and Transport

Soil samples will be identified using the relevant Alliance project number, the sampling point identification number and the sampling depth interval (e.g. BH01/0.0-0.2 or TP05/0.5-0.7), and date the sample was collected.

Samples will be:

- placed in laboratory prepared containers (containing preservatives as appropriate), bulk sample bags and zip lock bags; and
- stored in insulated containers with ice.

Samples will be transported to the relevant analytical laboratory by Alliance or a third party courier, using chain of custody (COC) documentation.

18.7.5 Selection of Laboratory

The analytical laboratories used for this project will reputable industry recognised environmental laboratories, that are NATA accredited for the analytical methods used.

18.7.6 Scheduling of Laboratory Analysis

Collected samples will be scheduled for laboratory analysis based on:

- The COPC identified for the AEC the sample was collected from;

- Observations made of the sample when collected (including staining, odour, presence of anthropogenic materials, and presence of potential asbestos containing materials);
- The results of sample headspace screening (if applicable); and
- The need for specific qualitative or quantitative data to inform assessment of risk associated with other laboratory analytical data (e.g. pH, cation exchange capacity, clay content, organic carbon content).

The laboratory analytical schedule adopted for this project for the preferred remedial works, is set out in **Table 18.7.6.1**.

Table 18.7.6.1 Schedule of Laboratory Analysis for Preferred Remediation

ID	AEC	Asbestos (0.001%)
AEC01a	AEC01a - Fill materials impacted by asbestos fines around TP03. ((75m^2 and ~0.6m thick)	All
-	Virgin excavated natural material	All samples for relevant contaminants of concern, based on guidance presented in https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material
-	Excavated natural material	All samples for the chemicals and attributes in Table 4 of The excavated natural material Order 2014. Validation samples by environmental consultant for asbestos (ACM 10L field screening, and AF 0.001% w/w laboratory analysis)
-	Other imported material	All samples for the relevant chemicals and attributes in the relevant resource recovery order. Validation samples by environmental consultant for asbestos (ACM 10L field screening, and AF 0.001% w/w laboratory analysis)

18.7.7 Analytical Methods, Limits of Reporting and Holding Times

The analytical methods, limits of reporting and sample holding times adopted for this project, are set out in **Table 18.7.7.**

Table 18.7.7 Analytical Methods, Limits of Reporting and Holding Times

Analyte	Method	Limit of Reporting (mg/kg)	Holding Time
Asbestos ID	AS4926	Absence / presence	No limit
Asbestos (WA DOH)	Inhouse	0.001% w/w	No limit

19 Site Remediation and Validation Report

At the completion of remedial works, a site remediation and validation report will be prepared with reference to the relevant sections of NSW EPA (2020b). The site remediation and validation report will include:

- An executive summary;
- The scope of reporting work undertaken;
- Site identification details;
- A summary of geology and hydrogeology;
- A summary of site condition and the surrounding environment;
- Information on supplementary contamination assessment works undertaken (if any);
- A pre-remediation conceptual site model;
- Summary of the remedial action plan;
- Information on the remediation activities undertaken;
- Information on waste management;
- Information on the validation works undertaken;
- Information on imported material;
- An assessment of field and laboratory quality assurance / quality control data;
- Validation results and discussion;
- A post remediation conceptual site model; and
- Conclusions and recommendations.

20 Site Management Plan

20.1 Register of Contacts

A register of contact details of stakeholders considered relevant to the project, is presented in **Table 20.1**.

Table 20.1 Register of Contacts

Role	Person	Stakeholder	Contact
Emergency Services	-	Police / Fire Ambulance	000
Site Owner	Alexander Allan	The Ice Skating Club of NSW Cooperative Limited	0425 392 108
Project Owner	Andrew Stanton	Hunter Scott	0408 226 427
Planning Authority	-	Canterbury City Council	02 9707 9000
WHS Regulatory Authority	-	SafeWork NSW	131 050
Environmental Regulatory Authority	-	NSW EPA	131 500
Remediation Contractor	To be confirmed	To be confirmed	To be confirmed
Environmental Consultant	Samuel Willis	Alliance	0472 784 385
Licensed Asbestos Assessor	Shambhu Shrestha	Alliance	0430 808 612

20.2 Emergency Preparedness and Response

An emergency assembly point will be established at an appropriate location, and this location communicated to workers and visitors during the site induction process. In the event an emergency situation arises, workers and visitors will assemble at this location (if safe to do so) and await further instructions from the site supervisor, project manager or emergency services.

Spill control kits and fire extinguishers will be located at appropriate locations at the site.

Contact details to be used in the event of an emergency, are presented in **Table 20.1**.

20.3 Community Relations

Occupants of properties adjoining the site and located immediately across the road from the site, will be provided with a notification of intent to undertake remedial works on the site, a minimum of two business days before commencing those remedial works.

A register will be maintained on site, for the recording of remedial works related communications from the community.

Communication received from community about the remedial works, will be directed to the project manager in the first instance. The project manager will arrange for the communication to responded to, in accordance with arrangements agreed to between the remediation contractor and the principal.

20.4 Signage, Security and Hours of Operations

The hours of operation at the site will be limited to:

- Monday to Friday between 7:00am and 5:00pm, and Saturday between 8:00am and 1:00pm; or
- days and times set out in the relevant development consent conditions (if available), which will take precedent over the aforementioned days and times.

The 24-hour contact details of the remediation contractor will be put on a sign, and posted on the site boundary, adjacent to the site access point. The sign will be maintained by the remediation contractor until completion of remedial works.

Security of the site will be maintained for the duration of the remedial works, with appropriate boundary fencing/barricades and access point locks.

20.5 Workplace Health and Safety

20.5.1 Safe Work Method Statements

All parties intending to undertake tasks in the remediation area/s will prepare a safe work method statement (SWMS) that documents:

- The task/s to be undertaken;
- Hazards associated with undertaking those task/s;
- A risk assessment of each hazard, considering consequence and likelihood;
- Control measures to be implemented to mitigate identified risks; and
- A re-assessment of each hazard, assuming control measure implementation, and showing a demonstrable decrease to the risk.

20.5.2 Personal Protective Equipment (PPE)

The following personal protective equipment (PPE) will be worn (as a minimum) by all persons working on, or visiting, the remediation work area/s:

- Eye protection (e.g. safety glasses or goggles);
- Long sleeves and long pants;
- A high visibility vest (or clothing);
- Protective foot wear (e.g. safety boots);
- Hard hat; and
- Cut resistant gloves.

Additional PPE or respiratory protective equipment (RPE) may also be required, subject to the control measures set out in the SWMS for the task.

20.5.3 Occupational Hygiene

Atmospheric monitoring will be undertaken or as may be recommended by a suitably experienced occupational hygienist. Monitoring may include airborne fibre monitoring during asbestos remedial works.

Plant and equipment will be appropriately decontaminated before leaving a remedial works zone.

20.5.4 Decontamination

The following decontamination procedure will apply to all persons exiting the remediation work area/s:

- Cleaning of protective footwear, including removal of potentially contaminated material from the soles of the footwear; and
- Washing of hands (including prior to eating, drinking or smoking).

20.6 Asbestos Removal Control Plan (ARCP)

An asbestos removal control plan (ARCP) will be prepared for licensed asbestos removal works, that:

- considers asbestos registers relevant to the asbestos to be removed and the area to be worked on;
- identifies the specific control measures that will be used to ensure workers and other people are not at unacceptable risk when asbestos removal work is being conducted;
- considers Appendix B in SafeWork NSW (2022);
- will include, as far as is practicable, consultation with the client, the person with management or control of the site, workers, and workers' health and safety representatives.

Once prepared, copies of the ARCP will be:

- given to the person who commissioned the licensed asbestos removal work
- kept at the workplace until the completion of the asbestos removal work; and
- readily accessible on site for the duration of the licensed asbestos removal work, to:
- PCBUs at the workplace;
- workers or their health and safety representatives; and
- the occupants of the premises (if the work is carried out in residential premises).

The ARCP will also be made available for inspection.

If a notifiable incident occurs in connection with the asbestos removal work to which the ARCP relates, the licensed asbestos removalist will keep the plan for at least two years after the incident occurs.

20.7 Traffic Management

The remediation contractor will:

- ensure vehicles exit the site in a forward direction;
- arrange for receipt and dispatch of materials during approved remedial working hours (refer **Section 20.4**);

- securely cover all loads to prevent dust or odour emissions during transportation; and
- utilise suitable experienced and qualified traffic controllers (as required).

Traffic and haulage routes will be selected based on:

- compliance with traffic road rules;
- opportunities to mitigate noise, vibration, dust and odour impacts to properties/occupants adjacent to the site; and
- preference for state controlled roads (as opposed to local roads);

20.8 Soil and Stormwater Management

20.8.1 Site Access and Egress

A sediment and erosion control plan will be prepared by the remediation contractor, to suit the nature and staging of the remedial works. Control measures will be operated and maintained by the remediation contractor, until completion of the remedial works.

Vehicle and plant site access/egress will be managed to prevent soils being tracked onto roads and pathways external to the site (e.g. gravels, gabions, cattle grids). Soil will be broomed or washed off tyres/tracks prior to the vehicle or plant leaving the remediation work area. Broomed/washed soil will be managed onsite, depending on its likely contamination status.

Surface stormwater generated from (or travelling through) the remediation works area, will be managed using relevant measures set out in Landcom (2004).

In the event soils are tracked onto roads or pathways external to the site, these soils will be removed by sweeping and/or shovelling.

20.8.2 Stockpiles

Stockpiles of material generated during remedial works will be:

- generally constructed as low elongated mounds on level surfaces;
- placed away from stormwater pits, drainage lines and gutters;
- not located on footpaths or nature strips, unless approved by the local planning authority;
- stored in secure areas and covered if remaining on site for more than 24 hours; and
- kept damp if containing (or suspected of containing) asbestos.

20.8.3 Groundwater and Excavation Pump Out

Should excavations require water to be pumped out, the water will be sampled and analysed by a suitably experienced environmental consultant, for total suspended solids (TSS), pH, metals (8) and petroleum hydrocarbons.

If the laboratory analytical results are less than the relevant[11] aquatic ecosystem groundwater investigation levels (GILs) set out in ANZECC (2000), then the excavation water may be discharged to the local stormwater system.

If the laboratory analytical results are greater than the relevant[12] aquatic ecosystem groundwater investigation levels (GILs) set out in ANZECC (2000), then other options for the excavation water will be considered, including:

- assessment of proposed receiving waters, in the context of the contaminant concentrations found in the excavation water;
- removal and offsite disposal by a liquid waste contractor; or
- discharge to sewer under an approval obtained from the relevant sewerage infrastructure operator.

In the event the site requires dewatering, development consent from the relevant planning authority and/or approvals from the state water authority, will be obtained (if required).

20.8.4 Site Rehabilitation

Areas of the site that become exposed as a result of remedial works, will be stabilised progressively, as remedial works are completed. Stabilisation methods will be maintained until such time as they are no longer required (e.g. vegetation becomes established and self-sustaining, or site development work commences).

20.9 Waste Management

Wastes generated during remedial works will be removed from site for recycling / disposal, with reference to NSW EPA (2014) and the relevant provisions of the Protection of the Environment Operations Act 1997 and SafeWork NSW (2022).

The remediation contractor will maintain detailed records of each load of waste generated during remedial works, including:

- The location the waste was generated from;
- The classification of the waste;
- The date and time the waste was removed from the site;
- The vehicle registration number of the waste transport vehicle;
- Evidence of Integrated Waste Tracking Solution (IWTS) information (where applicable), including the waste transporter's licence details;
- The volume of each waste type removed from site;
- Weighbridge receipt docket from the waste receiving facility; and
- The number of the environment protection licence (EPL) authorising the receiving facility to accept that classification or waste.

[11] Freshwater or marine, and adopted based on protection levels that consider aquatic ecosystem disturbance.
[12] Freshwater or marine, and adopted based on protection levels that consider aquatic ecosystem disturbance.

20.10 Dust Control

The following control measures will be implemented to mitigate risk of dust emissions migrating beyond the boundary of the remediation work area/s:

- erection of dust screens around the perimeter of the site (e.g. fencing with shade cloth attached);
- securely covering all loads entering or exiting the site;
- use of water sprays across the site to suppress dust;
- covering stockpiles of contaminated soil remaining on site for more than 24 hours;
- keeping excavation surfaces moist;
- wetting down of placed fill material during spreading;
- sweeping of hardstand surfaces;
- minimising soil disturbance works during windy days; and
- retaining stabilised site access/egress points for vehicles.

20.11 Odour Control

Should odours be detected at the site boundary during remediation works, monitoring of those odours may be undertaken, using methods[13] suited to the odour type, based on recommendations from a suitably experienced odour consultant (if required). This may include:

- use of appropriate covering techniques such as plastic sheeting to cover excavation faces or stockpiles;
- use of fine mist sprays (which may incorporate deodorizing agents);
- use of hydrocarbon mitigating agents on impacted areas/materials; and
- adequate maintenance of equipment and machinery to minimise exhaust emissions.

20.12 Airborne Asbestos Monitoring

Airborne asbestos monitoring will be undertaken on site by a Licensed Asbestos Assessor (LAA) during friable asbestos removal or handling. Monitoring during bonded asbestos removal, will be undertaken, subject to advice provided by the occupational hygienist/competent person appointed to the project.

Monitoring will be used to validate controls put in place to mitigate potential asbestos exposure.

Portable battery operated air monitors will be placed in static positions approximately 1.5m above the ground surrounding the asbestos handling / removal area.

Analysis of monitors will be undertaken by a NATA-accredited laboratory. The results of analysis will be compared to the criteria presented in **Table 20.12** and the appropriate action applied.

[13] Methods could include instrumental, chemical analysis, electronic, sensory tests or olfactometry.

Table 20.12 Atmospheric Monitoring Action Criteria and Measures

Detected Concentration (fibres per millilitre)	Action
<0.01	Continue with established control measures
0.01 to 0.02	Review established control measures Investigate probably cause Establish additional control to mitigate further fibre release
>0.02	Stop works Notify the relevant regulatory authority that work has ceased Investigate probably cause Extent the works exclusion zone Establish additional control to mitigate further fibre release Do not re-commence work until detected concentrations are at or below 0.01 fibres per millilitre

20.13 Noise and Vibration Control

Plant and equipment being utilised for remedial works, will be fitted with noise attenuation devices (e.g. exhaust mufflers). Where possible, selection and use of reversing alarms will avoid standard tonal pulse alarms.

Vehicle access roads will be designed to mitigate the need for vehicles and mobile plant to reverse during travel (e.g. creation of turning circles in the immediate vicinity of remediation work area/s).

'Offensive noise', as defined under the Protection of the Environment Operations Act 1997, will not be emitted beyond the site boundary, during remedial works.

Vibrations generated during remedial works will be managed to mitigate risk of damage to structural assets and risk of amenity loss to adjacent land occupiers. Advice from geotechnical, structural or vibration consultants will be sought, if required.

20.14 Site Incident Contingency Plan

There are inherent risks of incidents to occur onsite that may affect the surrounding environment and community. Based on the site history information made available to Alliance for preparation of this RAP, it is considered plausible that incidents involving the surrounding environment and community, outlined in **Table 20.14**, could occur during site works. Contingency plans and protocols to be implemented, should those incidents occur, are presented in **Table 20.14**.

Table 20.14 Site Incident Contingency Plan

Site Incident	Contingency Plan
High levels of dust detected outside the boundary of the site as a result of site works	Stop works, notify relevant stakeholders. Assess the application and effectiveness of measures outlined in **Section 20.10**. If measures are assessed to be inappropriate, consider additional measures, such as (but not limited to) postponing of works to account for poor weather conditions, or similar, and update the site management plan.
High levels of odours detected outside the boundary of the site as a result of site works	Stop works, notify relevant stakeholders. Assess the application and effectiveness of measures outlined in **Section 20.11**.

Table 20.14 Site Incident Contingency Plan

Site Incident	Contingency Plan
	If measures are assessed to be inappropriate, consider additional measures, such as engaging a suitably experienced odour consultant, or similar, to assess and provide advice on odour management.
High levels of noise and/or vibration detected outside the boundary of the site as a result of site works	Stop works, notify all necessary stakeholders, and assess the applications and effectiveness of measures outlined in **Section 20.13**. If measures are assessed to be inappropriate, consider additional measures, such as engaging a suitably experienced geotechnical, structural or vibration consultant, or similar, to assess and provide advice on noise / vibration management.
Asbestos detected above 0.02 fibres per millilitre in asbestos air monitors at site boundaries	Stop works, notify relevant stakeholders, and as per **Table 20.12**: o Notify the relevant regulatory authority that work has ceased. o Investigate probably cause. o Extend the works exclusion zone. o Establish additional control to mitigate further fibre release. o Do not re-commence work until detected concentrations are at or below 0.01 fibres per millilitre.

21 Conclusions

Based on the assessment undertaken by Alliance of site history information, fieldwork observations and data, and laboratory analytical data, in the context of the proposed land use scenario and objectives of this project, Alliance considers that the remediation objective can be achieved and the site made suitable for the proposed land use scenario, subject to the:

- Implementation of the strategies, methodologies, plans and procedures set out in this remediation action plan; and
- Preparation of a site remediation and validation report.

Specific assumptions that apply to the adopted land use scenario, are presented in **Section 6** of this report.

This report must be read in conjunction with the ***Important Information About This Report*** statements at the front of this report.

22 References

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CRC CARE 2019g, ‘Guideline on stakeholder engagement’, dated June 2019, Version 0.1

CRC CARE 2019h, ‘Guideline on documentation, record-keeping and reporting’, dated June 2019, Version 0.1

CRC CARE 2019i, ‘Guideline on validation and closure’, dated June 2019, Version 0.1

CRC CARE 2019j, ‘Guideline on implementing long-term monitoring’, dated June 2019, Version 0.1

CRC CARE 2019k, ‘Guideline on the role of auditing’, dated June 2019, Version 0.1

CRC CARE 2019l, ‘Guideline on implementing institutional controls’, dated June 2019, Version 0.1

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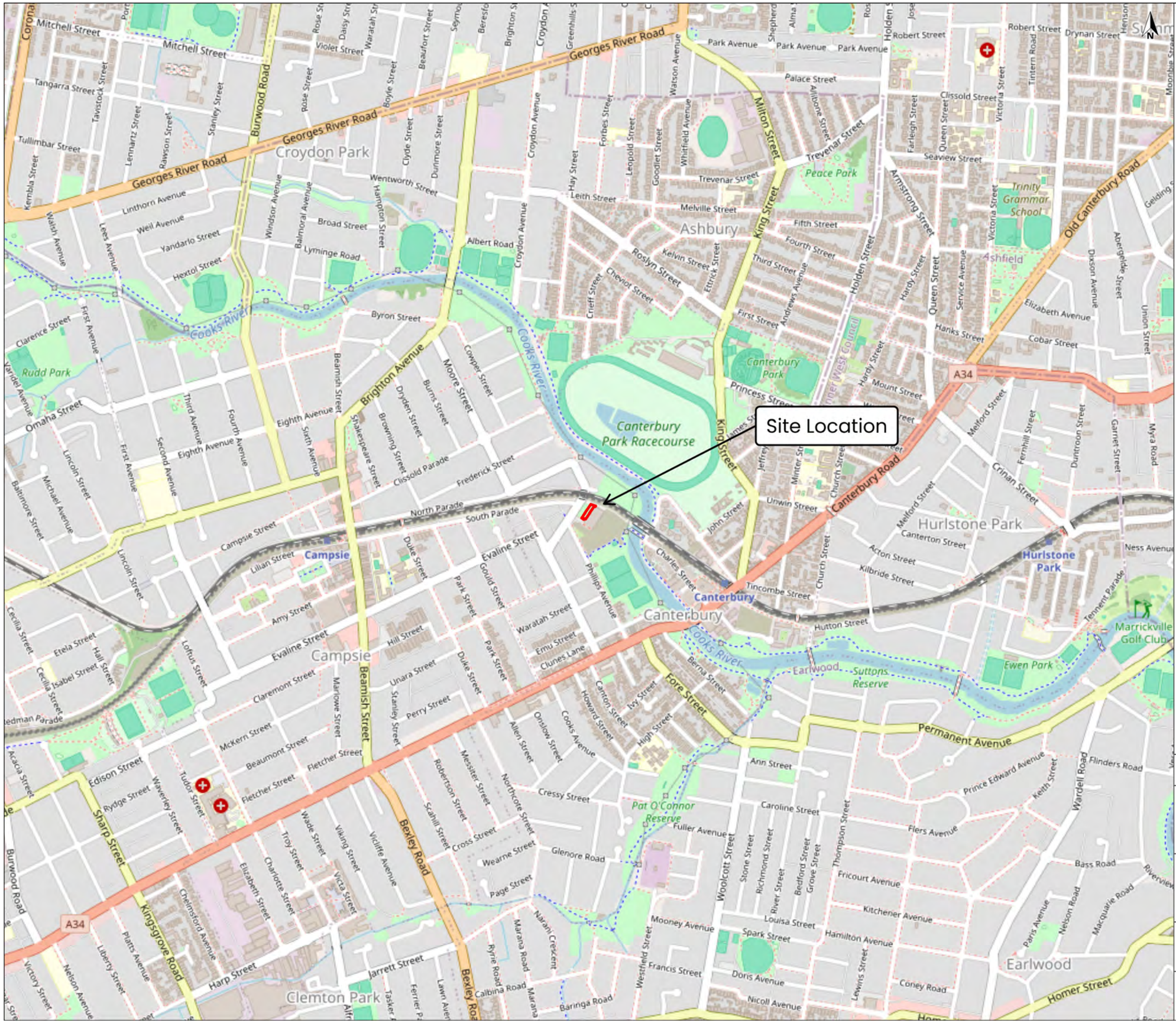
FIGURES



Legend

- Site Boundary

alliance

Produced by **Datanest.earth**

Title: Site Locality Plan		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: DH	Figure No.: 1
Date: 07-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:13500	Version: ER-4-1

Legend

- Site Access
- Site Boundary

0 5 m 10 m

alliance

Produced by **Datanest.earth**

Title: Site Layout Plan		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: DH	Figure No.: 2
Date: 07-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:400	Version: ER-4-1

Legend

- Site Boundary
- Approximate Acid Sulfate and Waste Classification Bore Locations
- Approximate Waste Classification Bore Locations

0 5 m 10 m

alliance

Produced by **Datanest.earth**

Title: Alliance (2024b) Sampling Plan		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: DH	Figure No.: 3
Date: 07-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:300	Version: ER-4-1

Legend

- DSI Test Pit Locations
- Site Boundary

0 2.5 m 5 m

alliance

Produced by **Datanest.earth**

Title: Alliance (2025a) Sampling Plan		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: DH	Figure No.: 4
Date: 07-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:250	Version: ER-4-1

Legend

- DSI Test Pit Locations
- Site Boundary
- AEC01 - Site Footprint

0 2.5 m 5 m

alliance

Produced by **Datanest.earth**

Title: Exceedances - Soils		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: DH	Figure No.: 5
Date: 08-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:250	Version: ER-4-1

Legend

- Approximate location of site boundary
- Approximate Test Pit Locations
- Approximate Strip Trench
- Alliance (2025a) Sampling Point Locations

0 2.5 m 5 m

alliance

Produced by **Datanest.earth**

Title: SCA Sampling Point Locations		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: JR	Figure No.: 6
Date: 15-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:278	Version: ER-4-1

Legend

- AEC01a - Approximate area of asbestos fines impacted soils
- Site Boundary

0 2.5 m 5 m

alliance

Produced by **Datanest.earth**

Title: Revised Areas of Environmental Concern		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: MC	Figure No.: 7
Date: 08-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:250	Version: ER-4-1

Legend

- AEC01a - Approximate area of asbestos fines impacted soils
- Site Boundary

0 2.5 m 5 m

alliance

Produced by **Datanest.earth**

Title: Inferred Extent of Remediation		
Client: The Ice Skating Club of NSW Cooperative Limited		Size: A3
Project: Canterbury Olympic Ice Rink	Drawn: MC	Figure No.: 8
Date: 24-01-2025	Checked: SW	
Proj No: 18587	Scale: 1:150	Version: ER-4-1

Tables

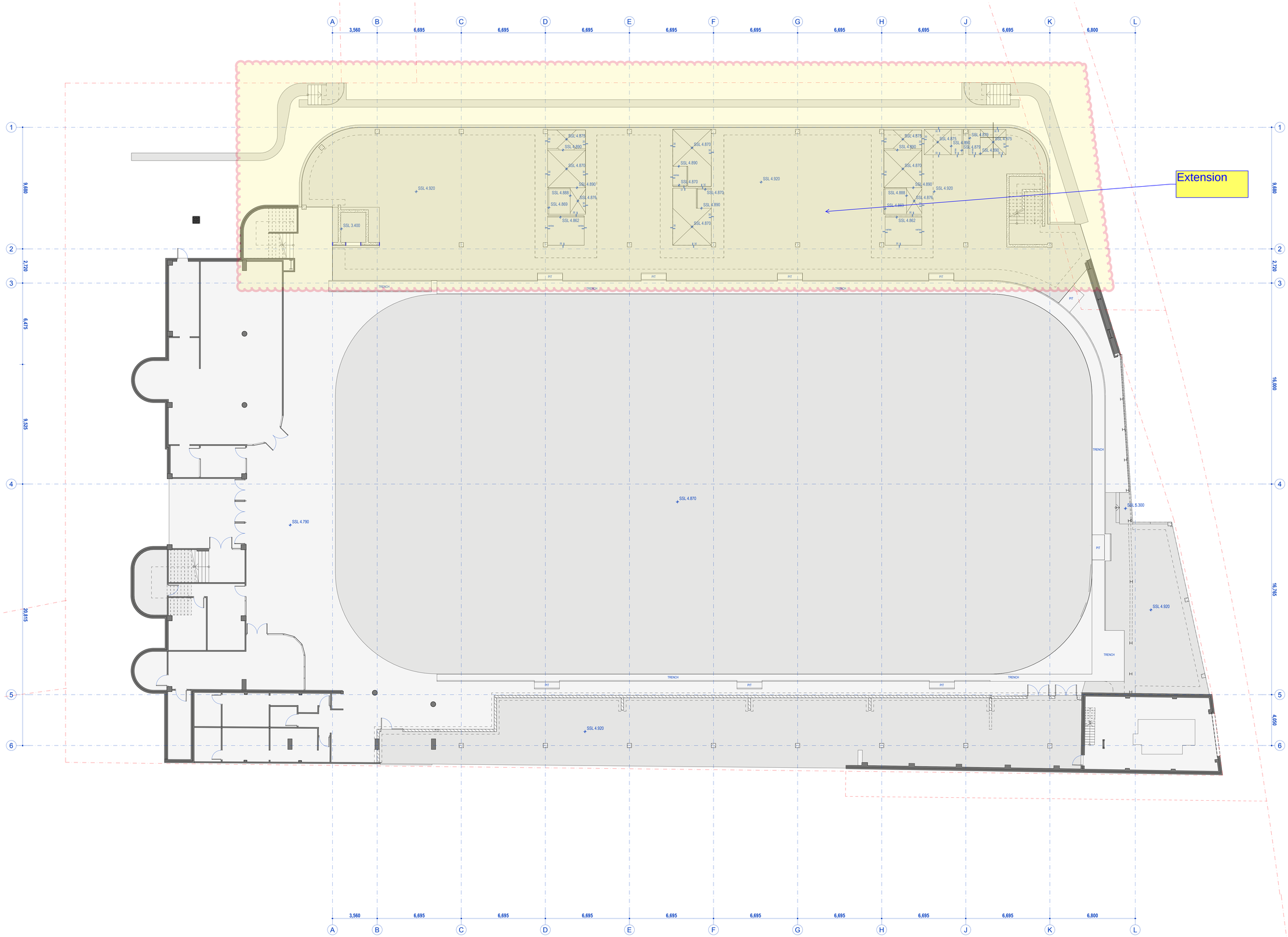
Client: Canterbury Olympic Ice Rink
Project: Canterbury Olympic Ice Rink, Portion of 17A Phillips Avenue, Canterbury
Project No.: 18587-ER-4-1

Table LR1 - Supplementary Contamination Assessment

Sample ID	Date Sampled	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL D - FA/AF	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL D - Bonded ACM	Laboratory Results			On-site gravimetric results		
				Asbestos Detected/ Not-Detected	Percentage of AF/FA <7mm (%w/w)	Percentage of Bonded ACM >7mm (500ml) (%w/w)	Weight of Sample (10L) (g)	Onsite weight of ACM fragment >7mm (g)	Percentage of Bonded ACM >7mm (10L) (%w/w)
TP09 0.0-0.5	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	11800	Not-Detected	Not-Detected
TP10 0.0-0.4	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	11700	Not-Detected	Not-Detected
TP11 0.0-0.4	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	12200	Not-Detected	Not-Detected
TP12 0.0-0.6	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	11100	Not-Detected	Not-Detected
TP13 0.0-0.6	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	12300	Not-Detected	Not-Detected
TP14 0.0-0.4	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	10900	Not-Detected	Not-Detected
TP15 0.0-0.6	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	13100	Not-Detected	Not-Detected
TP16 0.0-0.6	21.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	12500	Not-Detected	Not-Detected

	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 AF/FA
	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 Bonded ACM
	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 Surface Soil
ACM	Asbestos Containing Material
FA and AF	Fibrous Asbestos and Asbestos Fines
-	No published criteria or sample not analysed
NL	Not Limiting
*	Detected at below the limit of reporting
	Weight of soil in the field based on assumed density of 1.65/kg based on WA DOH (2009) Guidance

APPENDIX A – Proposed Development Plans



notes
The Builder shall check all dimensions and levels on site prior to construction. Notify any errors, discrepancies or omissions to the architect. Refer to written dimensions only. Do not scale off drawings. Drawings shall not be used for construction purposes until issued for construction. All works to comply with the Building Code of Australia and applicable Australian Standards.

All boundaries and contours are subject to survey drawing **204036**, dated 12/10/2020 by W. Buxton Pty. Ltd. All levels to Australian Height Datum. It is the contractors responsibility to confirm all measurements on site and locations of any services prior to work on site.

Project Manager Hunter Scott PH:	Civil Engineering Turnbull PH:	Section J ADP Consulting PH:	Acoustic ADP Consulting PH:	BCA + Access Consultant Ventura Building Surveyors PH:
Structural ADP Consulting PH:	Electrical ADP Consulting PH:	Hydraulic ADP Consulting PH:	Mechanical ADP Consulting PH:	Principal Certifying Authority TBC PH:

revision

P01	Preliminary Structural Set Out Plans	13/9/2024
P03	Preliminary ADP Coordination Set	30/10/2024

kennedy associates architects
Level 3, 1 Booth Street P +61 2 9557 6466 E mail@kennedyassociates.com.au nominated architect Steve Kennedy
Annandale NSW 2038 F +61 2 9557 6477 W www.kennedyassociates.com.au registration number 5828

project
Canterbury Olympic Ice Rink Redevelopment
Alterations + Additions to Existing Building
17A Phillips Ave
Canterbury NSW 2193

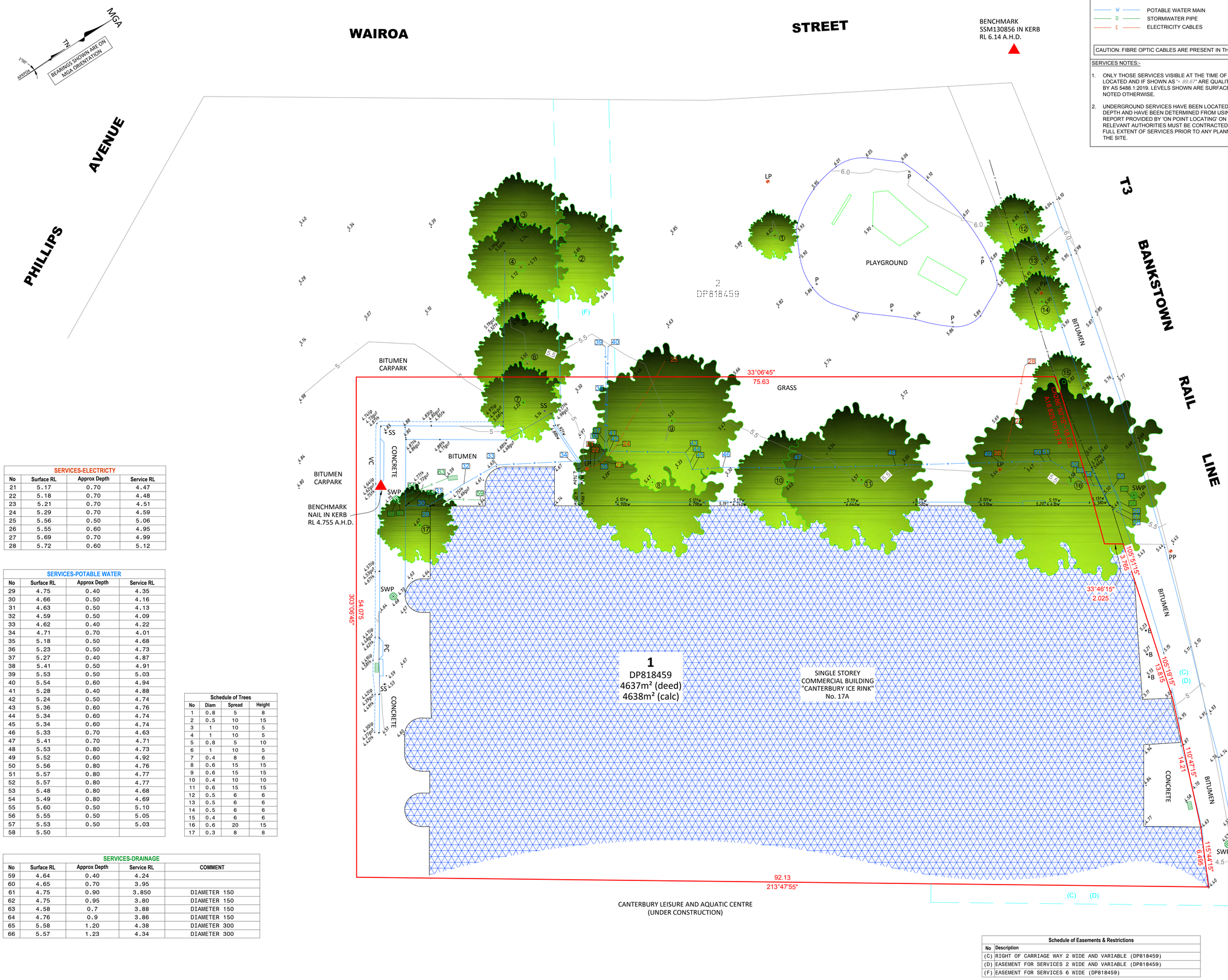
drawing
Ground Floor Structure Set Out Plan

dwg no. **2221 – 1100**
rev no. **P03**

scale: 1:100 @ A0
file: 2221 - CC Master_01
drawn: LP approved: date: 30/10/2024

APPENDIX B – Detail and Level Survey

A1



SERVICES-ELECTRICITY			
No	Surface RL	Approx Depth	Service RL
21	5.17	0.70	4.47
22	5.18	0.70	4.48
23	5.21	0.70	4.51
24	5.29	0.70	4.59
25	5.56	0.50	5.06
26	5.55	0.60	4.95
27	5.69	0.70	4.99
28	5.72	0.60	5.12

SERVICES-POTABLE WATER			
No	Surface RL	Approx Depth	Service RL
29	4.75	0.40	4.35
30	4.66	0.50	4.16
31	4.63	0.50	4.13
32	4.59	0.50	4.09
33	4.62	0.40	4.22
34	4.71	0.70	4.01
35	5.18	0.50	4.68
36	5.23	0.50	4.73
37	5.27	0.40	4.87
38	5.41	0.50	4.91
39	5.53	0.50	5.03
40	5.54	0.60	4.94
41	5.28	0.40	4.88
42	5.24	0.50	4.74
43	5.36	0.60	4.76
44	5.34	0.60	4.74
45	5.34	0.60	4.74
46	5.33	0.70	4.63
47	5.41	0.70	4.71
48	5.53	0.80	4.73
49	5.52	0.60	4.92
50	5.56	0.80	4.76
51	5.57	0.80	4.77
52	5.57	0.80	4.77
53	5.48	0.80	4.68
54	5.49	0.80	4.69
55	5.60	0.50	5.10
56	5.55	0.50	5.05
57	5.53	0.50	5.03
58	5.50		

Schedule of Trees			
No	Diam	Spread	Height
1	0.8	5	8
2	0.5	10	15
3	1	10	5
4	1	10	5
5	0.8	5	10
6	1	10	5
7	0.4	8	6
8	0.6	15	15
9	0.6	15	15
10	0.4	10	10
11	0.6	15	15
12	0.5	6	6
13	0.5	6	6
14	0.5	6	6
15	0.4	6	6
16	0.6	20	15
17	0.3	8	8

SERVICES-DRAINAGE				
No	Surface RL	Approx Depth	Service RL	COMMENT
59	4.64	0.40	4.24	
60	4.65	0.70	3.95	
61	4.75	0.90	3.850	DIAMETER 150
62	4.75	0.95	3.80	DIAMETER 150
63	4.58	0.7	3.88	DIAMETER 150
64	4.76	0.9	3.86	DIAMETER 150
65	5.58	1.20	4.38	DIAMETER 300
66	5.57	1.23	4.34	DIAMETER 300

Schedule of Easements & Restrictions	
No	Description
(C)	RIGHT OF CARRIAGE WAY 2 WIDE AND VARIABLE (DP818459)
(D)	EASEMENT FOR SERVICES 2 WIDE AND VARIABLE (DP818459)
(F)	EASEMENT FOR SERVICES 6 WIDE (DP818459)

2 4 6 8 10 20
1:200

ISSUE	DATE	AMENDMENT	SURV	CHK
A	05/03/2024	ORIGINAL ISSUE	EA	CT

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GDA2020

ISO Management Systems ISO 9001 Global-Mark.com.au® ISO Environmental Management ISO 14001 Global-Mark.com.au® ISO Occupational Health & Safety Management ISO 45001 Global-Mark.com.au®

MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

GENERAL NOTES

ONLY TREES GREATER THAN 3.5 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN.

CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.

LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (AHD).

ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK SHOWN ON THIS PLAN.

BOUNDARY NOTES

A BASIC BOUNDARY SURVEY HAS BEEN DONE SUITABLE FOR DA LODGEMENT PURPOSES.

BOUNDARIES HAVE NOT BEEN MARKED.

SURVEY INFORMATION NOTES

THE ORIGIN OF COORDINATES COMES FROM SSM130856 E325538.961 N6246304.717 CLASS B POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 01/03/2024.

THE ORIGIN OF LEVELS COMES FROM SSM130856 RL6.141 CLASS LB POSITIONAL UNCERTAINTY (PU) 0.01 ADOPTED FROM SCIMS DATED 01/03/2024.

THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY A COORDINATE JOIN BETWEEN SSM130856 AND SSM130869.

CERTIFICATE OF TITLE NOTES

THE FOLLOWING INFORMATION RELATES TO THE CERTIFICATE OF TITLE OF THE SUBJECT LOT:

- LOT 1 IN DP818459
(CT EDITION 4 DATED 04/10/2005 SEARCH DATE 08/03/2024)
  - BENEFITED BY:
    - RIGHT OF WAY (Z43673)
    - RIGHT OF CARRIAGEWAY 2 WIDE AND VARIABLE (DP818459) SHOWN AS (C)
    - EASEMENT FOR SERVICES 2 WIDE AND VARIABLE (DP818459) SHOWN AS (D)
    - EASEMENT FOR SERVICES VARIABLE WIDTH (DP818459)
    - EASEMENT FOR SERVICES 6 WIDE (DP818459) SHOWN AS (F)
    - EASEMENT FOR SEWERAGE (DP818459)
- LOT 2 IN DP818459
(CT EDITION 1 DATED 14/09/1992 SEARCH DATE 12/03/2024)
  - AFFECTED BY:
    - RIGHT OF CARRIAGE 2 WIDE AND VARIABLE (DP818459) SHOWN AS (C)
    - EASEMENT FOR SERVICES 2 WIDE AND VARIABLE (DP818459) SHOWN AS (D)
    - EASEMENT FOR SERVICES VARIABLE WIDTH (DP818459)
    - EASEMENT FOR SERVICES 6 WIDE (DP818459) SHOWN AS (F)
    - EASEMENT FOR SEWERAGE PURPOSES OVER EXISTING LINE OF PIPES (DP818459)
    - RESTRICTION(S) ON THE USE OF LAND (DP818459)
  - BENEFITED BY:
    - RIGHT OF WAY (Z43673)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.

SERVICES NOTES

NO UNDERGROUND SURVEY SEARCH HAS BEEN UNDERTAKEN. THERE MAY BE ADDITIONAL SERVICES WITHIN THE SURVEY AREA.

ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019.

UNDERGROUND SERVICES HAVE BEEN LOCATED FOR BY 'ON POINT LOCATING' ON 04/03/2024 USING EQUIPMENT AS NOTED ON REPORT PROVIDED DATED 04/03/2024. THE SERVICE POSITION IS SHOWN ON THE PLAN AND THEIR RESPECTIVE DEPTH AND QUALITY ARE AS STATED IN THE TABLE. UNDERGROUND SERVICE LOCATION WAS ONLY UNDERTAKEN ON THE QUOTED AREA

ALL RELEVANT AUTHORITIES MUST BE CONTACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

LEGEND

TAG	DESCRIPTION
B	BOLLARD
GR	GRATE
LP	LIGHT POLE
PC	PEDESTRIAN CROSSING
PP	POWER POLE
SS	STREET SIGN
SWP	STORMWATER PIT
VC	VEHICLE CROSSING

UNDERGROUND SERVICES LEGEND
QUALITY LEVEL B (AS 5488.1:2019)

W — POTABLE WATER MAIN
D — STORMWATER PIPE
E — ELECTRICITY CABLES

CAUTION: FIBRE OPTIC CABLES ARE PRESENT IN THIS AREA

SERVICES NOTES:-

1. ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND IF SHOWN AS *"+ 89.67"* ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019. LEVELS SHOWN ARE SURFACE LEVELS UNLESS NOTED OTHERWISE.
2. UNDERGROUND SERVICES HAVE BEEN LOCATED FOR POSITION AND DEPTH AND HAVE BEEN DETERMINED FROM USING EQUIPMENT ON REPORT PROVIDED BY 'ON POINT LOCATING' ON 04/03/2024. ALL RELEVANT AUTHORITIES MUST BE CONTRACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

PROJECT:
DETAIL AND LEVEL SURVEY OF
LOT 1 IN DP818459 AND
PART OF LOT 2 IN DP818459

17A PHILLIPS AVENUE
CANTERBURY

CLIENT: HUNTER SCOTT

FILE: 9132 17A PHILLIPS AVENUE CANTERBURY

LGA: CANTERBURY - BANKSTOWN	
REF: 9132	CONTOURS: 0.5m
ISSUE: A	DATUM: AHD
SURVEY DATE: 05/03/2024	AZIMUTH: MGA2020
SCALE: 1:200	SHEET 1 OF 1 SHEETS

SDG Pty Ltd
abn 85 213 523 621
Suite 1, 3 Railway Street, Baulkham Hills NSW 2153
t: (02) 9630 7955 w: sdg.net.au
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under Professional Standards Legislation

APPENDIX C – Alliance (2024b) Logs

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ENVIRONMENTAL BOREHOLE BH01

CLIENT The Ice Skating Club of NSW Cooperative LTD
PROJECT Waste Classification & VENM Assessment
PROJECT NUMBER 18587
ADDRESS 17A Phillips Avenue, Canterbury

CONTRACTOR Epoca Environmental
DRILLER BD
RIG TYPE Geoprobe 7822DT
BOREHOLE SIZE 125mm

STARTED 18/11/24
FINISHED 18/11/24
LOGGED DH
CHECKED JR

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA			(FILL) SAND, fine to medium grained, brown, trace low plasticity clay and rootlets, dry to moist.	0.0-0.1 J + ASB	FILL No PACM, odour or staining
	0.5		(FILL) SAND, fine to medium grained, pale brown, trace rootlets and coarse gravels of sandstone and brick, dry to moist	0.3-0.4 J + ASB	FILL No PACM, odour or staining
			(FILL) SAND, fine to medium grained, pale yellow/brown, trace fragments of concrete, dry to moist.	0.6-0.7 J + ASB	FILL No PACM, odour or staining
	1			0.9-1.0 J + ASB	
			BH01 terminated at 1.0m bgl, auger refusal.		

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ENVIRONMENTAL BOREHOLE BH02

CLIENT The Ice Skating Club of NSW Cooperative LTD
PROJECT Waste Classification & VENM Assessment
PROJECT NUMBER 18587
ADDRESS 17A Phillips Avenue, Canterbury

CONTRACTOR Epoca Environmental
DRILLER BD
RIG TYPE Geoprobe 7822DT
BOREHOLE SIZE 125mm

STARTED 18/11/24
FINISHED 18/11/24
LOGGED DH
CHECKED JR

COMMENTS Push tube refusal at 2.3m bgl, drilling advanced with solid flight auger to 3.4m bgl.

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA	0.0		(FILL) SAND, fine to medium grained, brown, trace glass, rootlets and medium ironstone gravels, dry to moist.	0.0-0.1 J + ASB + ASS	FILL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
	0.5		CLAY, low to medium plasticity, pale grey mottled orange and red, trace rootlets, dry to moist.	0.5-0.6 J + ASB + ASS 0.8-0.9 J + ASB	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
PT	1		CLAY, low to medium plasticity, pale grey mottled orange and red, with fine sand, dry to moist.	1.0-1.1 ASS	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
	1.5			1.5-1.6 ASS	
	2			2.0-2.1 ASS	
SFA	2.5			2.5-2.6 ASS	
	3			3.0-3.1 ASS 3.3-3.4 ASS	
	3.5		BH02 terminated at 3.4m bgl, target depth.		
	4				

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ENVIRONMENTAL BOREHOLE BH03

CLIENT The Ice Skating Club of NSW Cooperative LTD	**CONTRACTOR** Epoca Environmental	**STARTED** 18/11/24
PROJECT Waste Classification & VENM Assessment	**DRILLER** BD	**FINISHED** 18/11/24
PROJECT NUMBER 18587	**RIG TYPE** Geoprobe 7822DT	**LOGGED** DH
ADDRESS 17A Phillips Avenue, Canterbury	**BOREHOLE SIZE** 125mm	**CHECKED** JR

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA			(FILL) SAND, fine to medium grained, brown, with fine to medium sandstone and ironstone gravels, trace low plasticity clay	0.0-0.1 J + ASB Dup01 Trip01	FILL No PACM, odour or staining.
	0.5		Sandy CLAY, medium plasticity, orange and brown, with fine grained sand, trace rootlets, dry to moist.	0.3-0.4 J + ASB	NATURAL No PACM, odour or staining.
			Sandy CLAY, medium plasticity, pale grey mottled orange, with fine grained sand, trace rootlets, dry to moist.	0.7-0.8 J + ASB	NATURAL No PACM, odour or staining.
	1		BH03 terminated at 1.0m bgl, target depth.		

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ENVIRONMENTAL BOREHOLE BH04

CLIENT The Ice Skating Club of NSW Cooperative LTD
PROJECT Waste Classification & VENM Assessment
PROJECT NUMBER 18587
ADDRESS 17A Phillips Avenue, Canterbury

CONTRACTOR Epoca Environmental
DRILLER BD
RIG TYPE Geoprobe 7822DT
BOREHOLE SIZE 125mm

STARTED 18/11/24
FINISHED 18/11/24
LOGGED DH
CHECKED JR

COMMENTS Push tube refusal at 1.5m bgl, drilling advanced with solid flight auger to 2.0m bgl

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA			(FILL) SAND, fine to medium grained, brown, with fine to medium sandstone and ironstone gravels, trace low plasticity clay and glass, dry to moist.	0.0-0.1 J + ASB + ASS rinsate-01	FILL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
	0.5		Sandy CLAY, medium plasticity, brown and orange, with fine sand, trace rootlets, dry to moist.	0.5-0.6 J + ASB + ASS	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
			Sandy CLAY, medium plasticity, pale grey mottled orange, with fine sand, trace rootlets, dry to moist.	0.7-0.8 J + ASB + ASS 0.9-1.0 J + ASB + ASS	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
PT	1				
			CLAY, low to medium plasticity, grey, dry	1.2-1.3 ASS 1.7-1.8 ASS	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
SFA	1.5				
	2		BH04 terminated at 2.0m bgl, target depth.		
	2.5				

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ENVIRONMENTAL BOREHOLE BH05

CLIENT The Ice Skating Club of NSW Cooperative LTD
PROJECT Waste Classification & VENM Assessment
PROJECT NUMBER 18587
ADDRESS 17A Phillips Avenue, Canterbury

CONTRACTOR Epoca Environmental
DRILLER BD
RIG TYPE Geoprobe 7822DT
BOREHOLE SIZE 125mm

STARTED 18/11/24
FINISHED 18/11/24
LOGGED DH
CHECKED JR

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA	0		(FILL) SAND, fine to medium grained, brown, trace fine to medium gravels of sandstone and brick, trace glass, dry to moist.	0.0-0.1 J + ASB + ASS Dup02 Trip02	FILL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
	0.5			0.5-0.6 J + ASB + ASS	
			CLAY, low to medium plasticity, pale grey mottled orange, trace fine sand and rootlets, dry to moist.	0.6-0.7 J + ASB + ASS	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
				0.9-1.0 J + B	
PT	1			1.1-1.2 ASS	
	1.5			1.6-1.7 ASS	
				1.9-2.0 ASS	Strong rotten egg odour observed in soil arisings from 1.9m bgl.
	2		BH05 terminated at 2.0m bgl, target depth.		
	2.5				

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ENVIRONMENTAL BOREHOLE BH06

CLIENT The Ice Skating Club of NSW Cooperative LTD
PROJECT Waste Classification & VENM Assessment
PROJECT NUMBER 18587
ADDRESS 17A Phillips Avenue, Canterbury

CONTRACTOR Epoca Environmental
DRILLER BD
RIG TYPE Geoprobe 7822DT
BOREHOLE SIZE 125mm

STARTED 18/11/24
FINISHED 18/11/24
LOGGED DH
CHECKED JR

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA			(FILL) SAND, fine to medium grained, brown, trace fine to medium sandstone gravels and rootlets, dry to moist.	0.0-0.1 J + ASB	FILL No PACM, odour or staining.
	0.5		Sandy CLAY, low to medium plasticity, orange and brown, fine grained sand, dry to moist.	0.5-0.6 J + ASB	NATURAL No PACM, odour or staining.
			CLAY, low to medium plasticity, pale grey mottled orange, dry to moist.	0.8-0.9 J + ASB	NATURAL No PACM, odour or staining.
	1		BH06 terminated at 1.0m bgl, target depth.		

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ENVIRONMENTAL BOREHOLE BH07

CLIENT The Ice Skating Club of NSW Cooperative LTD
PROJECT Waste Classification & VENM Assessment
PROJECT NUMBER 18587
ADDRESS 17A Phillips Avenue, Canterbury

CONTRACTOR Epoca Environmental
DRILLER BD
RIG TYPE Geoprobe 7822DT
BOREHOLE SIZE 125mm

STARTED 18/11/24
FINISHED 18/11/24
LOGGED DH
CHECKED JR

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA			(FILL) SAND, fine to medium grained, brown, trace medium to coarse ironstone gravels, trace rootlets, dry to moist.	0.0-0.1 J + ASB	FILL No PACM, odour or staining.
	0.5		CLAY, low to medium plasticity, pale grey mottled orange, dry to moist.	0.5-0.6 J + ASB 0.8-0.9 J + ASB	NATURAL No PACM, odour or staining.
	1		BH07 terminated at 1.0m bgl, target depth.		

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ENVIRONMENTAL BOREHOLE BH08

CLIENT The Ice Skating Club of NSW Cooperative LTD
PROJECT Waste Classification & VENM Assessment
PROJECT NUMBER 18587
ADDRESS 17A Phillips Avenue, Canterbury

CONTRACTOR Epoca Environmental
DRILLER BD
RIG TYPE Geoprobe 7822DT
BOREHOLE SIZE 125mm

STARTED 18/11/24
FINISHED 18/11/24
LOGGED DH
CHECKED JR

COMMENTS Push tube refusal at 1.8m bgl, drilling advanced with solid flight auger to 2.0m bgl.

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
HA			(FILL) SAND, fine to medium grained, brown, trace medium to coarse ironstone gravels, trace rootlets, dry to moist.	0.0-0.1 J + ASB + ASS	FILL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
	0.5		CLAY, low to medium plasticity, pale grey mottled orange, dry to moist.	0.5-0.6 J + ASB + ASS	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
PT				0.8-0.9 J + ASB	
	1			1.0-1.1 ASS	
	1.5		CLAY, low to medium plasticity, pale grey, orange and red, dry to moist.	1.5-1.6 ASS	NATURAL No PACM, odour or staining. No visual or olfactory indicators of PASS or ASS.
SFA				1.9-2.0 ASS	Moderate rotten egg odour observed in soil arisings from 1.9m bgl.
	2		BH05 terminated at 2.0m bgl, target depth.		
	2.5				

APPENDIX D – Alliance (2025a) Logs

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geotechnical & environmental solutions

Alliance Geotechnical Pty Ltd
T: 1800 288 188
E: office@allgeo.com.au
W: www.allgeo.com.au

TP No: TP01
Sheet: 1 of 1
Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered		0.5		-	FILL: Gravelly Silty SAND, subangular, well graded, dark brown, with minor clay, with rootlets, roots, glass, brick, sandstone cobbles, plaster.	0.0-1.0	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 11.7Kgs AQ: 0.1-1.0: 12.3Kgs
			1.0		SC	Clayey SAND, fine grained, subrounded, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.5			Target depth. Test Pit TP01 terminated at 1.3m				

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TP No: TP02
Sheet: 1 of 1
Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered		0.5		-	FILL: Silty SAND, subangular, well graded, dark brown, with minor clay and gravel, trace plastic and brick.	0.0-0.6	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 13.5Kgs AQ: 0.1-0.6: 13.7Kgs
					CL-Cl	Silty CLAY, low to medium plasticity, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.0			Target depth. Test Pit TP02 terminated at 0.9m				
			1.5							

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TP No: TP03
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Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered				-	FILL: Silty SAND, subangular, well graded, dark brown, with minor clay, rootlets, glass and brick.	0.0-0.2	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 12.7Kgs AQ: 0.1-0.6: 12.5Kgs
			0.5		-	FILL: Silty Sandy CLAY, low plasticity, brown with minor orange mottling, with minor brick, glass, trace slag.	0.2-0.6	M	-	FILL No PACM, staining, or odour. AQ: 0.1-0.6: 13.1Kgs
					CL-Cl	Silty CLAY, low to medium plasticity, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.0			Target depth. Test Pit TP03 terminated at 0.9m				
			1.5							

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TP No: TP04
Sheet: 1 of 1
Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered				-	FILL: Silty SAND, subangular, well graded, dark brown, with minor clay, rootlets, glass and brick.	0.0-0.2	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 12.5Kgs AQ: 0.1-0.6: 13.8Kgs
			0.5		-	FILL: Silty Sandy CLAY, low plasticity, brown with minor orange mottling, with minor brick, glass, trace slag.	0.2-0.6	M	-	FILL No PACM, staining, or odour. AQ: 0.1-0.6: 13.9Kgs
					CL-Cl	Silty CLAY, low to medium plasticity, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.0			Target depth. Test Pit TP04 terminated at 0.9m				
			1.5							

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TP No: TP05
Sheet: 1 of 1
Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered		0.5		-	FILL: Silty Gravelly SAND, subangular, well graded, dark brown, with clay, minor roots, rootlets, glass, and brick.	0.0-0.5	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 13.6Kgs AQ: 0.1-0.6: 14.2Kgs
			1.0		CL-Cl	Silty Gravelly CLAY, low to medium plasticity, brown mottled pale orange, with trace sand.	0.5-1.0	M	-	NATURAL No PACM, staining, or odour. AQ: 0.1-0.6: 13.2Kgs
					CL-Cl	Silty CLAY, low to medium plasticity, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.5			Target depth. Test Pit TP05 terminated at 1.3m				

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TP No: TP06
Sheet: 1 of 1
Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered		0.5		-	FILL: Silty Gravelly SAND, subangular, well graded, dark brown, with clay, minor roots, rootlets, glass, and brick.	0.0-0.5	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 13.5Kgs AQ: 0.1-0.6: 14.0Kgs
			1.0		CL-Cl	Silty Gravelly CLAY, low to medium plasticity, brown mottled pale orange, with trace sand.	0.5-1.0	M	-	NATURAL No PACM, staining, or odour. AQ: 0.1-0.6: 13.1Kgs
					CL-Cl	Silty CLAY, low to medium plasticity, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.5			Target depth. Test Pit TP06 terminated at 1.3m				

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TP No: TP07
Sheet: 1 of 1
Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered				-	FILL: Silty SAND, subangular, well graded, dark brown, with minor clay, rootlets.	0.0-0.1	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 12.7Kgs
			0.5		-	FILL: Gravelly Silty SAND, subangular, well graded, brown, with clay.	0.1-0.7	M	-	FILL No PACM, staining, or odour. AQ: 0.1-0.6: 12.6Kgs
			1.0		CL-Cl	Silty CLAY, low to medium plasticity, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.5			Target depth. Test Pit TP07 terminated at 1m				

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TP No: TP08
Sheet: 1 of 1
Job No: 18587

Test Pit Log

Client: The Ice Skating Club of NSW Cooperative Limited
Started: 6/01/2025
Project: Detailed Site Investigation
Finished: 6/01/2025
Location: 17A Phillips Avenue, Canterbury NSW **Hole Location:** Refer to Figure 5
Test Pit Size: 0.3 m
Rig Type: 3.5t tracked hydraulic excavator **Hole Coordinates** E, N **Driller:** Paris **Logged:** SJ
RL Surface: m **Contractor:** Smart Scan **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	Not Encountered				-	FILL: Silty SAND, subangular, well graded, dark brown, with minor clay, rootlets.	0.0-0.1	M	-	FILL No PACM, staining, or odour. AQ: 0.0-0.1: 13.2Kgs
			0.5		-	FILL: Gravelly Silty SAND, subangular, well graded, brown, with clay.	0.1-0.7	M	-	FILL No PACM, staining, or odour. AQ: 0.1-0.6: 13.6Kgs
			1.0		CL-Cl	Silty CLAY, low to medium plasticity, pale grey mottled pale orange.		M	-	NATURAL No PACM, staining, or odour.
			1.5			Target depth. Test Pit TP08 terminated at 1m				

APPENDIX E – Alliance (2025a) Summary Tables

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-3-1

Table LR1 - Laboratory Analytical Results - Soils

		Metals								Asbestos
		Arsenic	Cadmium	Chromium (III+VI)**	Copper	Lead	Mercury	Nickel	Zinc	Asbestos I.D
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	Comment
EQL		2	0.4	5	5	5	0.1	5	5	
CRC Care HSL-D Commercial / Industrial										
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil										
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil										
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil		3,000	900		240,000	1,500	730	6,000	400,000	
Field ID	**Date**									
BH01-0.0-0.1	**18 Nov 2024**	14	<0.4	22	17	71	0.2	<5	58	ND
BH01-0.3-0.4	**18 Nov 2024**	34	<0.4	28	54	270	1.0	13	210	ND
BH01-0.6-0.7	**18 Nov 2024**	3.9	<0.4	8.1	17	67	0.4	<5	27	ND
BH02-0.0-0.1	**18 Nov 2024**	9.4	<0.4	14	9.3	40	0.1	<5	27	ND
BH02-0.5-0.6	**18 Nov 2024**	5.6	<0.4	11	<5	20	<0.1	<5	<5	ND
BH03-0.0-0.1	**18 Nov 2024**	18	<0.4	22	8.9	96	0.2	<5	93	ND
BH03-0.3-0.4	**18 Nov 2024**	9.1	<0.4	12	<5	17	<0.1	<5	<5	ND
BH04-0.0-0.1	**18 Nov 2024**	9.4	<0.4	14	5.6	130	0.3	<5	140	ND
BH04-0.5-0.6	**18 Nov 2024**	20	<0.4	23	<5	22	<0.1	<5	15	ND
BH05-0.0-0.1	**18 Nov 2024**	11	<0.4	16	71	1,300	0.5	<5	490	ND
BH05-0.5-0.6	**18 Nov 2024**	11	<0.4	19	11	140	0.2	<5	77	ND
BH05-0.6-0.7	**18 Nov 2024**	22	<0.4	27	<5	43	<0.1	<5	16	ND
BH06-0.0-0.1	**18 Nov 2024**	13	<0.4	20	12	63	0.2	<5	40	ND
BH06-0.5-0.6	**18 Nov 2024**	17	<0.4	27	<5	26	<0.1	<5	<5	ND
BH07-0.0-0.1	**18 Nov 2024**	12	<0.4	18	36	200	0.2	6.2	110	ND
BH07-0.5-0.6	**18 Nov 2024**	10	<0.4	17	6.5	41	<0.1	<5	<5	ND
BH08-0.0-0.1	**18 Nov 2024**	10.0	<0.4	15	9.6	47	<0.1	<5	29	ND
BH08-0.5-0.6	**18 Nov 2024**	12	<0.4	15	<5	20	<0.1	<5	<5	ND
DUP01	**18 Nov 2024**	9.1	<0.4	15	7.6	69	0.1	<5	71	
Statistics										
Number of Results		**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**18**
Number of Detects		**19**	**0**	**19**	**13**	**19**	**11**	**2**	**14**	**18**
Minimum Concentration		**3.9**	**<0.4**	**8.1**	**<5**	**17**	**0.1**	**<5**	**<5**	**1**
Minimum Detect		**3.9**	**ND**	**8.1**	**5.6**	**17**	**0.1**	**6.2**	**15**	**1**
Maximum Concentration		**34**	**<0.4**	**28**	**71**	**1,300**	**1**	**13**	**490**	**1**
Maximum Detect		**34**	**ND**	**28**	**71**	**1,300**	**1**	**13**	**490**	**1**
Average Concentration *		**13**	**0.2**	**18**	**15**	**141**	**0.2**	**3.2**	**74**	**1**
Median Concentration *		**11**	**0.2**	**17**	**8.9**	**63**	**0.1**	**2.5**	**29**	**1**
Standard Deviation *		**6.8**	**0**	**5.6**	**19**	**288**	**0.23**	**2.5**	**115**	**0**
95% UCL (Student's-t) *		**15.89**	**0.2**	**20.3**	**22.25**	**255.9**	**0.293**	**4.246**	**120.2**	**1**
% of Detects		**100**	**0**	**100**	**68**	**100**	**58**	**11**	**74**	**100**
% of Non-Detects		**0**	**100**	**0**	**32**	**0**	**42**	**89**	**26**	**0**

* A Non Detect Multiplier of 0.5 has been applied.
**Chromium VI
D / ND = Detect /
Non=Detect

Environmental Standards
CRC Care, 2011, CRC Care HSL-D Commercial / Industrial
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-3-1

Table LR1 - Laboratory Analytical Results - Soils

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		BTEX							TRH							TPH				
		Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.1	0.1	0.1	0.2	0.1	0.3	20	20	50	50	100	100	100	20	20	50	50	50
CRC Care HSL-D Commercial / Industrial		11,000	430	99,000	27,000			81,000	26,000		20,000		27,000	38,000						
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil									700		1,000		3,500	10,000						
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil									800		1,000		5,000	10,000						
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																				
Field ID	**Date**																			
BH01-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH01-0.3-0.4	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	150	<100	150	<20	<20	120	50	170
BH01-0.6-0.7	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH02-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	110	<100	110	<20	<20	63	<50	63
BH02-0.5-0.6	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH03-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	23	<50	<50	<50
BH03-0.3-0.4	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH04-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH04-0.5-0.6	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	22	<50	<50	<50
BH05-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH05-0.5-0.6	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH05-0.6-0.7	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	300	570	870	<20	<20	93	400	493
BH06-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH06-0.5-0.6	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH07-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH07-0.5-0.6	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH08-0.0-0.1	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH08-0.5-0.6	**18 Nov 2024**	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
DUP01	**18 Nov 2024**																			

Statistics

Number of Results	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**18**	**18**	**18**	**18**	**18**	**19**	**18**	**18**	**18**	**18**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**3**	**0**	**2**	**3**	**2**	**3**
Minimum Concentration	**<0.5**	**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.3**	**<20**	**<20**	**<50**	**<50**	**<100**	**<100**	**<100**	**<20**	**<20**	**<50**	**50**	**<50**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**110**	**570**	**110**	**ND**	**22**	**63**	**50**	**63**
Maximum Concentration	**<0.5**	**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.3**	**<20**	**<20**	**<50**	**<50**	**300**	**570**	**870**	**<20**	**23**	**120**	**400**	**493**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**300**	**570**	**870**	**ND**	**23**	**120**	**400**	**493**
Average Concentration *	**0.25**	**0.05**	**0.05**	**0.05**	**0.1**	**0.05**	**0.15**	**10**	**10**	**25**	**25**	**73**	**79**	**104**	**10**	**11**	**36**	**47**	**61**
Median Concentration *	**0.25**	**0.05**	**0.05**	**0.05**	**0.1**	**0.05**	**0.15**	**10**	**10**	**25**	**25**	**50**	**50**	**50**	**10**	**10**	**25**	**25**	**25**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**63**	**123**	**193**	**0**	**4**	**27**	**88**	**113**
95% UCL (Student's-t) *	**0.25**	**0.05**	**0.05**	**0.05**	**0.1**	**0.05**	**0.15**	**10**	**10**	**25**	**25**	**98.47**	**129.1**	**183.5**	**10**	**13.05**	**47.44**	**83.4**	**107.6**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**6**	**17**	**0**	**11**	**17**	**11**	**17**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**83**	**94**	**83**	**100**	**89**	**83**	**89**	**83**

* A Non Detect Multiplier of 0.5 has been applied.
**Chromium VI
D / ND = Detect /
Non=Detect

Environmental Standards
CRC Care, 2011, CRC Care HSL-D Commercial / Industrial
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-3-1

Table LR1 - Laboratory Analytical Results - Soils

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		PAH																		Halogenated Benzenes
		Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (Zero)	PAHs (Sum of total)	Hexachlorobenzene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.05
CRC Care HSL-D Commercial / Industrial															11,000					
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																				
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																				
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																		40	4,000	80
Field ID	**Date**																			
BH01-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	0.8	0.6	2.8	<0.05
BH01-0.3-0.4	**18 Nov 2024**	<0.5	<0.5	1.9	1.9	1.7	1.8	0.9	2.2	2.7	0.5	6.0	<0.5	0.8	<0.5	5.8	4.1	2.9	30	<0.5
BH01-0.6-0.7	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH02-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.3	<0.05
BH02-0.5-0.6	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH03-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH03-0.3-0.4	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH04-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH04-0.5-0.6	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH05-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	1.5	<0.05
BH05-0.5-0.6	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH05-0.6-0.7	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH06-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	0.6	1.0	<0.5	0.9	0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	0.8	0.8	4.7	<0.05
BH06-0.5-0.6	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH07-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	0.7	0.6	0.6	1.1	0.5	1.0	0.6	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	0.8	0.9	6.7	<0.5
BH07-0.5-0.6	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH08-0.0-0.1	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
BH08-0.5-0.6	**18 Nov 2024**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
DUP01	**18 Nov 2024**																			

Statistics

Number of Results	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**
Number of Detects	**0**	**0**	**2**	**2**	**4**	**3**	**2**	**4**	**3**	**1**	**6**	**0**	**1**	**0**	**1**	**6**	**4**	**6**	**0**
Minimum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**0.5**	**<0.5**	**0.5**	**<0.5**	**0.5**	**0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.05**
Minimum Detect	**ND**	**ND**	**0.7**	**0.6**	**0.5**	**1**	**0.5**	**0.6**	**0.5**	**0.5**	**0.7**	**ND**	**0.8**	**ND**	**5.8**	**0.6**	**0.6**	**1.3**	**ND**
Maximum Concentration	**<0.5**	**<0.5**	**1.9**	**1.9**	**1.7**	**1.8**	**0.9**	**2.2**	**2.7**	**0.5**	**6**	**<0.5**	**0.8**	**<0.5**	**5.8**	**4.1**	**2.9**	**30**	**<0.5**
Maximum Detect	**ND**	**ND**	**1.9**	**1.9**	**1.7**	**1.8**	**0.9**	**2.2**	**2.7**	**0.5**	**6**	**ND**	**0.8**	**ND**	**5.8**	**4.1**	**2.9**	**30**	**ND**
Average Concentration *	**0.25**	**0.25**	**0.37**	**0.36**	**0.38**	**0.43**	**0.3**	**0.46**	**0.42**	**0.26**	**0.73**	**0.25**	**0.28**	**0.25**	**0.56**	**0.6**	**0.48**	**2.8**	**0.05**
Median Concentration *	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.025**
Standard Deviation *	**0**	**0**	**0.4**	**0.39**	**0.35**	**0.43**	**0.16**	**0.49**	**0.58**	**0.059**	**1.3**	**0**	**0.13**	**0**	**1.3**	**0.9**	**0.64**	**7**	**0.073**
95% UCL (Student's-t) *	**0.25**	**0.25**	**0.529**	**0.522**	**0.527**	**0.601**	**0.366**	**0.658**	**0.656**	**0.288**	**1.278**	**0.25**	**0.334**	**0.25**	**1.095**	**0.97**	**0.744**	**5.661**	**0.0798**
% of Detects	**0**	**0**	**11**	**11**	**22**	**17**	**11**	**22**	**17**	**6**	**33**	**0**	**6**	**0**	**6**	**33**	**22**	**33**	**0**
% of Non-Detects	**100**	**100**	**89**	**89**	**78**	**83**	**89**	**78**	**83**	**94**	**67**	**100**	**94**	**100**	**94**	**67**	**78**	**67**	**100**

* A Non Detect Multiplier of 0.5 has been applied.
**Chromium VI
D / ND = Detect /
Non=Detect

Environmental Standards
CRC Care, 2011, CRC Care HSL-D Commercial / Industrial
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-3-1

Table LR1 - Laboratory Analytical Results - Soils

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		Organochlorine Pesticides																						
		Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5
CRC Care HSL-D Commercial / Industrial																									
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																									
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil																									
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil							45		530				3,600					100				50		2,500	160
Field ID	**Date**																								
BH01-0.0-0.1	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH01-0.3-0.4	**18 Nov 2024**	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH01-0.6-0.7	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH02-0.0-0.1	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH02-0.5-0.6	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH03-0.0-0.1	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH03-0.3-0.4	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH04-0.0-0.1	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH04-0.5-0.6	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH05-0.0-0.1	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH05-0.5-0.6	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH05-0.6-0.7	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH06-0.0-0.1	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH06-0.5-0.6	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH07-0.0-0.1	**18 Nov 2024**	<10	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH07-0.5-0.6	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH08-0.0-0.1	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH08-0.5-0.6	**18 Nov 2024**	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
DUP01	**18 Nov 2024**																								

Statistics

Number of Results		**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration		**<0.1**	**<0.1**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.1**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.5**
Minimum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration		**<10**	**<10**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<10**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<10**
Maximum Detect		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *		**0.35**	**0.35**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.35**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.53**
Median Concentration *		**0.05**	**0.05**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.05**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.25**
Standard Deviation *		**1.2**	**1.2**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**1.2**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**0.073**	**1.1**
95% UCL (Student's-t) *		**0.828**	**0.828**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.828**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.0798**	**0.986**
% of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.
**Chromium VI
D / ND = Detect /
Non=Detect

Environmental Standards
CRC Care, 2011, CRC Care HSL-D Commercial / Industrial
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-3-1

Table LR1 - Laboratory Analytical Results - Soils

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	PCBs							
	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CRC Care HSL-D Commercial / Industrial								
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil								
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil								
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil								7
Field ID **Date**								
BH01-0.0-0.1 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH01-0.3-0.4 **18 Nov 2024**	<1	<1	<1	<1	<1	<1	<1	<1
BH01-0.6-0.7 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH02-0.0-0.1 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH02-0.5-0.6 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH03-0.0-0.1 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH03-0.3-0.4 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH04-0.0-0.1 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH04-0.5-0.6 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH05-0.0-0.1 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH05-0.5-0.6 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH05-0.6-0.7 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH06-0.0-0.1 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH06-0.5-0.6 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH07-0.0-0.1 **18 Nov 2024**	<1	<1	<1	<1	<1	<1	<1	<1
BH07-0.5-0.6 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH08-0.0-0.1 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH08-0.5-0.6 **18 Nov 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DUP01 **18 Nov 2024**								

Statistics

Number of Results	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**
Number of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Minimum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**
Maximum Detect	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Median Concentration *	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Standard Deviation *	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**
95% UCL (Student's-t) *	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**
% of Detects	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.
**Chromium VI
D / ND = Detect /
Non=Detect

Environmental Standards
CRC Care, 2011, CRC Care HSL-D Commercial / Industrial
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Fine Soil
2013, NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-3-1

Table LR2 - Laboratory Analytical Results - Acid Sulfate Soils

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			Acid Sulphate Soils - Field				Acid Sulphate Soils			Acid Sulphate Soils - Acid Base Accounting	Acid Sulphate Soils - Acidity Trail		Acid Sulphate Soils - Liming Rate		Acid Sulphate Soils - Potential Acidity	
			pHF	pHFox	Difference between pHF & pHFox	Reaction Rate	Net Acidity (Acidity Units) - CRS Suite	Net Acidity (Sulfur Units) - CRS Suite	s-CRS Suite - Net Acidity - NASSG (Excluding ANC)	ANC Fineness Factor	Titratable Actual Acidity (sulfur units)	Titratable Actual Acidity	CRS Suite - Liming Rate	Liming Rate excluding ANC	Chromium Reducible Sulphur (acidity units)	Chromium Reducible Sulfur
			-	-		-	MOL H+/T	% S	% S	-	%S	mole H+/t	KG CACO3/T	kg CaCO3/t	mole H+/t	%S
EQL			0.1	0.1	0.2	0	10	0.02	0.02		0.003	2	1	1	3	0.005
Sullivan 2018 Acid Sulfate Soils Action Criteria (Coarse and Peats), 1–1000 t materials disturbed			<4	<3	<1	≥ 3	≥ 18	≥ 0.03	-	-	-	-	-	-	-	0.1
Sullivan 2018 Acid Sulfate Soils Action Criteria (clayey sand to light clays), 1–1000 t materials disturbed			<4	<3	<1	≥ 3	≥ 36	≥ 0.06	-	-	-	-	-	-	-	0.1
Field ID	**Date**	**Matrix Description**														
BH02-0.0-0.1	**18/11/24**	**Fill**	5.9	2.7		3.0	37	0.06	0.06	1.5	0.060	37	2.8	2.8	<3	<0.005
BH02-0.5-0.6	**18/11/24**	**Nat**	5.0	4.1		2.0	-	-	-	-	-	-	-	-	-	-
BH02-1.0-1.1	**18/11/24**	**Nat**	4.7	3.7		3.0	-	-	-	-	-	-	-	-	-	-
BH02-1.5-1.6	**18/11/24**	**Nat**	5.3	4.2		1.0	-	-	-	-	-	-	-	-	-	-
BH02-2.0-2.1	**18/11/24**	**Nat**	5.7	4.7		1.0	-	-	-	-	-	-	-	-	-	-
BH02-2.5-2.6	**18/11/24**	**Nat**	6.0	3.7		1.0	17	0.03	0.03	1.5	0.020	10	1.3	1.3	7.7	0.012
BH02-3.0-3.1	**18/11/24**	**Nat**	5.7	3.8		1.0	13	0.02	0.02	1.5	0.020	13	1.0	1.0	<3	<0.005
BH02-3.3-3.4	**18/11/24**	**Nat**	6.0	4.2		2.0	<10	<0.02	<0.02	1.5	0.010	7.0	<1	<1	<3	<0.005
BH04-0.0-0.1	**18/11/24**	**Fill**	6.6	3.7		3.0	-	-	-	-	-	-	-	-	-	-
BH04-0.5-0.6	**18/11/24**	**Nat**	4.9	4.1		2.0	-	-	-	-	-	-	-	-	-	-
BH04-0.7-0.8	**18/11/24**	**Nat**	4.7	3.9		2.0	-	-	-	-	-	-	-	-	-	-
BH04-0.9-1.0	**18/11/24**	**Nat**	4.8	3.9		2.0	-	-	-	-	-	-	-	-	-	-
BH04-1.2-1.3	**18/11/24**	**Nat**	5.1	4.1		1.0	13	0.02	0.02	1.5	0.020	13	<1	<1	<3	<0.005
BH04-1.7-1.8	**18/11/24**	**Nat**	5.5	3.9		1.0	-	-	-	-	-	-	-	-	-	-
BH05-0.0-0.1	**18/11/24**	**Fill**	6.6	3.4		3.0	<10	<0.02	<0.02	1.5	0.010	6.0	<1	<1	<3	<0.005
BH05-0.5-0.6	**18/11/24**	**Fill**	7.0	4.7		2.0	<10	<0.02	<0.02	1.5	0.010	5.0	<1	<1	<3	<0.005
BH05-0.6-0.7	**18/11/24**	**Nat**	7.1	5.7		2.0	-	-	-	-	-	-	-	-	-	-
BH05-1.1-1.2	**18/11/24**	**Nat**	6.6	5.2		2.0	-	-	-	-	-	-	-	-	-	-
BH05-1.6-1.7	**18/11/24**	**Nat**	6.1	4.1		2.0	-	-	-	-	-	-	-	-	-	-
BH05-1.9-2.0	**18/11/24**	**Nat**	5.3	4.0		1.0	19	0.03	0.03	1.5	0.030	19	1.4	1.4	<3	<0.005
BH08-0.0-0.1	**18/11/24**	**Fill**	6.2	3.7		3.0	-	-	-	-	-	-	-	-	-	-
BH08-0.5-0.6	**18/11/24**	**Nat**	5.0	4.2		2.0	-	-	-	-	-	-	-	-	-	-
BH08-1.0-1.1	**18/11/24**	**Nat**	5.0	4.2		1.0	-	-	-	-	-	-	-	-	-	-
BH08-1.5-1.6	**18/11/24**	**Nat**	5.5	4.3		1.0	-	-	-	-	-	-	-	-	-	-
BH08-1.9-2.0	**18/11/24**	**Nat**	6.0	4.6		1.0	-	-	-	-	-	-	-	-	-	-
Statistics																
Minimum Detect			**4.7**	**2.7**		**1**	**13**	**0.02**	**0.02**	**1.5**	**0.01**	**5**	**1**	**1**	**7.7**	**0.012**
Maximum Detect			**7.1**	**5.7**		**3**	**37**	**0.06**	**0.06**	**1.5**	**0.06**	**37**	**2.8**	**2.8**	**7.7**	**0.012**
Average Concentration *			**5.7**	**4.1**		**1.8**	**14**	**0.024**	**0.024**	**1.5**	**0.023**	**14**	**1.1**	**1.1**	**2.3**	**0.0037**
Standard Deviation *			**0.72**	**0.58**		**0.76**	**11**	**0.017**	**0.017**	**0**	**0.017**	**10**	**0.8**	**0.8**	**2.2**	**0.0034**
95% UCL (Student's-t) *			**5.939**	**4.311**		**2.061**	**21.44**	**0.035**	**0.035**	**1.5**	**0.0337**	**20.75**	**1.597**	**1.597**	**3.743**	**0.00594**

* A Non Detect Multiplier of 0.5 has been applied.

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project No.: 18587-ER-3-1

Table LR3 - Summary Analytical Table - Asbestos in Soils

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Sample ID	Date Sampled	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL D - FA/AF	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL D - Bonded ACM	Laboratory Results			On-site gravimetric results		
				Asbestos Detected/ Not-Detected	Percentage of AF/FA <7mm (%w/w)	Percentage of Bonded ACM >7mm (500ml) (%w/w)	Weight of Sample (10L) (g)	Onsite weight of ACM fragment >7mm (g)	Percentage of Bonded ACM >7mm (10L) (%w/w)
TP01 0.00-0.10	07.01.2025	0.001%	0.05%	Not-Detected	-	-	11700.00	Not detected	Not detected
TP01 0.10-1.00	07.01.2025	0.001%	0.05%	Not-Detected	-	-	12300.00	Not detected	Not detected
TP01 0-1.00	07.01.2025			Not-Detected	Not-Detected	-	-	-	-
TP02 0.0-0.10	07.01.2025	0.001%	0.05%	Not-Detected	-	-	13500.00	Not detected	Not detected
TP02 0.10-0.60	07.01.2025	0.001%	0.05%	Not-Detected	-	-	13700.00	Not detected	Not detected
TP02 0-0.60	07.01.2025			Not-Detected	Not-Detected	-	-	-	-
TP03 0.0-0.10	07.01.2025	0.001%	0.05%	Not-Detected	-	-	12700.00	Not detected	Not detected
TP03 0.10-0.20	07.01.2025	0.001%	0.05%	Not-Detected	-	-	12500.00	Not detected	Not detected
TP03-0-0.20	07.01.2025			**Detected**	0.003%	-	-	-	-
TP03 0.20-0.60	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	13100.00	Not detected	Not detected
TP04 0.0-0.10	07.01.2025	0.001%	0.05%	Not-Detected	-	-	12500.00	Not detected	Not detected
TP04 0.10-0.20	07.01.2025	0.001%	0.05%	Not-Detected	-	-	13800.00	Not detected	Not detected
TP04 0.20-0.60	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	13000.00	Not detected	Not detected
TP04 0.0-0.20	07.01.2025			Not-Detected	Not-Detected	-	-	-	-
TP05 0.0-0.10	07.01.2025	0.001%	0.05%	Not-Detected	-	-	13000.00	Not detected	Not detected
TP05 0.10-0.50	07.01.2025	0.001%	0.05%	Not-Detected	-	-	14200.00	Not detected	Not detected
TP05 0.0-0.50	07.01.2025			Not-Detected	Not-Detected	-	-	-	-
TP05 0.50-1.00	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	13200.00	Not detected	Not detected
TP06 0.0-0.10	07.01.2025	0.001%	0.05%	Not-Detected	-	-	13500.00	Not detected	Not detected
TP06 0.10-0.50	07.01.2025	0.001%	0.05%	Not-Detected	-	-	14000.00	Not detected	Not detected
TP06 0.0-0.50	07.01.2025			Not-Detected	Not-Detected	-	-	-	-
TP06 0.50-1.00	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	13100.00	Not detected	Not detected
TP07 0.0-0.10	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	12700.00	Not detected	Not detected
TP07 0.10-0.70	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	12600.00	Not detected	Not detected
TP08 0.0-0.10	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	13200.00	Not detected	Not detected
TP08 0.10-0.70	07.01.2025	0.001%	0.05%	Not-Detected	Not-Detected	Not-Detected	13600.00	Not detected	Not detected

	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 AF/FA
	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 Bonded ACM
	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 Surface Soil
	Asbestos Detected
ACM	**Asbestos Containing Material**
FA and AF	**Fibrous Asbestos and Asbestos Fines**
-	**No published criteria or sample not analysed**
NL	**Not Limiting**
*	**Detected at below the limit of reporting**
	Weight of soil in the field based on assumed density of 1.65/kg based on WA DOH (2009) Guidance

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-3-1

Table LR4 - Laboratory Analytical Results - RPD Calculations

		Metals							
		Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		2	0.4	2	5	5	0.1	2	5
Field ID	**Date**								
BH03-0.0-0.1	**18 Nov 2024**	18	<0.4	22	8.9	96	0.2	<5	93
DUP01	**18 Nov 2024**	9.1	<0.4	15	7.6	69	0.1	<5	71
RPD		66	0	38	16	33	67	0	27
BH03-0.0-0.1	**18 Nov 2024**	18	<0.4	22	8.9	96	0.2	<5	93
Trip01	**18 Nov 2024**	9	<1	19	8	92	0.1	2	83
RPD		67	0	15	11	4	67	0	11

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 99999999 (0 - 10 x EQL); 50 (10 - 20 x EQL); 30 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Client: The Ice Skating Club of NSW Cooperative Limited
Project: Canterbury Olympic Ice Rink
Project Number: 18587-ER-1-1

Table LR5 - Laboratory Analytical Results - Trip Spike / Blank

		BTEX														TRH			TPH	
		Naphthalene (VOC)		Benzene		Toluene		Ethylbenzene		Xylene (m & p)		Xylene (o)		Xylene Total	Xylene Total	C6-C10 Fraction (F1)		C6-C10 (F1 minus BTEX)	C6-C9 Fraction	C6-C9 Fraction
		mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	mg/kg	%
EQL		0.5	1	0.1	1	0.1	1	0.1	1	0.2	1	0.1	1	0.3	1	20	1	20	20	1
Field ID	**Date**																			
TRIP BLANK	**18 Nov 2024**	<0.5	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.3	-	<20	-	<20	<20	-
TRIP SPIKE	**18 Nov 2024**	-	84	-	93	-	79	-	93	-	78	-	94	-	88	-	91	-	-	91
Statistics																				
Minimum Detect		**ND**	**84**	**ND**	**93**	**ND**	**79**	**ND**	**93**	**ND**	**78**	**ND**	**94**	**ND**	**88**	**ND**	**91**	**ND**	**ND**	**91**
Maximum Detect		**ND**	**84**	**ND**	**93**	**ND**	**79**	**ND**	**93**	**ND**	**78**	**ND**	**94**	**ND**	**88**	**ND**	**91**	**ND**	**ND**	**91**
Average Concentration *																				
Standard Deviation *																				
95% UCL (Student's-t) *																				

* A Non Detect Multiplier of 0.5 has been applied.

APPENDIX F – Data Quality Indicator (DQI) Assessment

Completeness DQI			
Field Considerations	*Target Criterion*	*Result*	*Pass / Fail / Comment*
Experienced sampling team used	Yes	Yes	Pass
Sampling devices and equipment set out in sampling plan were used (refer Section 8.3.7.2).	Yes	Yes	Pass
Critical locations in sampling plan, sampled (refer Section 8.3.7.2).	Yes	Yes	Pass
Critical samples in sampling plan, collected (refer Section 8.3.7.2).	Yes	Yes	Pass
Completed field and calibration logs attached	Yes	Yes	Pass
Completed chain of custody attached	Yes	Yes	Pass
Laboratory	*Target Criterion*	*Result*	*Pass / Fail / Comment*
Complete sample receipt advice and chain of custody attached	Yes	Yes	Pass
Critical samples identified in sampling plan, analysed	Yes	Yes	Pass
Analysis undertaken addresses COPC in sampling plan (refer Section 8.3.7.7)	Yes	Yes	Pass
Analytical methods reported in laboratory documentation and appropriate limit of reporting used	Yes	Yes	Pass
Sample holding times met (refer Section 8.3.7.8)	Yes	Yes	Pass

Comparability			
Laboratory Considerations	*Target Criterion*	*Result*	*Pass / Fail / Comment*
Same sampling team used for all work.	Yes	Yes	Pass
Weather conditions suitable for sampling.	Yes	Yes	Pass
Same sample types collected and preserved in same way (refer Section 8.3.7.2).	Yes	Yes	Pass
Relevant samples stored in insulated containers and chilled (refer Section 8.3.7.5).	Yes	Yes	Pass
Laboratory Considerations	*Target Criterion*	*Result*	*Pass / Fail / Comment*
Same laboratory used for all analysis (refer Section 8.3.7.6).	Yes	Yes	Pass
Comparable methods if different laboratories used Refer Section 18.7.8).	Not Applicable	N/A	N/A
Comparable limits of reporting if different laboratories used.	Not Applicable	N/A	N/A
Comparable units of measure if different laboratories have been used (refer Section 8.3.7.8).	Not Applicable	N/A	N/A

Representativeness			
Field Considerations	*Target Criterion*	*Result*	*Pass / Fail / Comment*
Media identified in sampling plan, sampled (refer Section 8.3.7.2).	Yes	Yes	Pass
Samples required by sampling plan, collected (refer Section 8.3.7.2).	Yes	Yes	Pass
Laboratory Considerations	*Target Criterion*	*Result*	*Pass / Fail / Comment*
Samples identified in sampling plan, analysed.	Yes	Yes	Pass

APPENDIX G – Supplementary Contamination Assessment Logs

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ENVIRONMENTAL TESPIT TP09

CLIENT The Ice Skating Club of NSW Cooperative
PROJECT Supplementary Contamination Assessr
PROJECT NUMBER 18587

CONTRACTOR Smartscan
EXCAVATOR OPERATOR PC
RIG TYPE 1.7T Excavator
TESTPIT SIZE 450mm

STARTED 21/01/2025
FINISHED 21/01/2025
LOGGED JP
CHECKED MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
			(FILL) Silty SAND, fine to medium grained, dark brown, with clay, trace rootlets, brick, concrete and tile, dry.	0.0-0.5 A	Fill No PACM, staining or odour noted. GRAV=11.8kg ACM=0g
	0.5		Silty CLAY, low to medium plasticity, pale brown mottled orange, trace ironstone gravels, dry.		NATURAL No PACM, staining or odour noted.
	1		TP09 terminated at 0.8m bgl, target depth achieved		

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ENVIRONMENTAL TESPIT TP10

CLIENT The Ice Skating Club of NSW Cooperative
PROJECT Supplementary Contamination Assessr
PROJECT NUMBER 18587

CONTRACTOR Smartscan
EXCAVATOR OPERATOR PC
RIG TYPE 1.7T Excavator
TESTPIT SIZE 450mm

STARTED 21/01/2025
FINISHED 21/01/2025
LOGGED JP
CHECKED MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
			(FILL) Silty SAND, fine to medium grained, dark brown, with clay, trace rootlets, dry.	0.0-0.4 A	Fill No PACM, staining or odour noted. GRAV=11.7kg ACM=0g
	0.5		Silty CLAY, high plasticity, pale grey mottled orange and brown, trace rootlets, dry.		NATURAL No PACM, staining or odour noted.
	1		TP10 terminated at 0.9m bgl, target depth achieved		

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ENVIRONMENTAL TESPIT TP11

CLIENT The Ice Skating Club of NSW Cooperative	**CONTRACTOR** Smartscan	**STARTED** 21/01/2025
PROJECT Supplementary Contamination Assessr	**EXCAVATOR OPERATOR** PC	**FINISHED** 21/01/2025
PROJECT NUMBER 18587	**RIG TYPE** 1.7T Excavator	**LOGGED** JP
	TESTPIT SIZE 450mm	**CHECKED** MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
			(FILL) Silty SAND, fine to medium grained, dark brown, with clay, trace rootlets, dry.	0.0-0.4 A	Fill No PACM, staining or odour noted. GRAV=12.2kg ACM=0g
	0.5		Silty CLAY, low to medium plasticity, pale brown mottled orange, trace ironstone gravels, dry.		NATURAL No PACM, staining or odour noted.
	1		TP11 terminated at 0.7m bgl, target depth achieved		

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ENVIRONMENTAL TESPIT TP12

CLIENT The Ice Skating Club of NSW Cooperative
PROJECT Supplementary Contamination Assessr
PROJECT NUMBER 18587

CONTRACTOR Smartscan
EXCAVATOR OPERATOR PC
RIG TYPE 1.7T Excavator
TESTPIT SIZE 450mm

STARTED 21/01/2025
FINISHED 21/01/2025
LOGGED JP
CHECKED MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
			(FILL) Silty SAND, fine to medium grained, brown, with clay, trace rootlets, glass, metal and plastic, dry.	0.0-0.5 A	Fill No PACM, staining or odour noted. GRAV=11.1kg ACM=0g
	0.5		Silty CLAY, low to medium plasticity, pale brown mottled orange, dry.		NATURAL No PACM, staining or odour noted.
	1		TP12 terminated at 0.8m bgl, target depth achieved		

alliance

ENVIRONMENTAL TESPIT TP13

CLIENT The Ice Skating Club of NSW Cooperative
PROJECT Supplementary Contamination Assessr
PROJECT NUMBER 18587

CONTRACTOR Smartscan
EXCAVATOR OPERATOR PC
RIG TYPE 1.7T Excavator
TESTPIT SIZE 450mm

STARTED 21/01/2025
FINISHED 21/01/2025
LOGGED JP
CHECKED MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
	0.5		(FILL) Silty SAND, fine to medium grained, dark brown, trace rootlets and clay, dry.	0.0-0.6 A	Fill No PACM, staining or odour noted. GRAV=12.3kg ACM=0g
			Silty CLAY, low to medium plasticity, pale brown mottled orange, dry.		NATURAL No PACM, staining or odour noted.
	1		TP13 terminated at 0.9m bgl, target depth achieved		

alliance

ENVIRONMENTAL TESPIT TP14

CLIENT The Ice Skating Club of NSW Cooperative
PROJECT Supplementary Contamination Assessr
PROJECT NUMBER 18587

CONTRACTOR Smartscan
EXCAVATOR OPERATOR PC
RIG TYPE 1.7T Excavator
TESTPIT SIZE 450mm

STARTED 21/01/2025
FINISHED 21/01/2025
LOGGED JP
CHECKED MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
			(FILL) Silty SAND, fine to medium grained, brown, with clay, trace rootlets and brick, dry.	0.0-0.4 A	Fill No PACM, staining or odour noted. GRAV=10.9kg ACM=0g
	0.5		Silty CLAY, low to medium plasticity, pale brown, trace ironstone gravels, dry.		NATURAL No PACM, staining or odour noted.
	1		TP14 terminated at 0.7m bgl, target depth achieved		

alliance

ENVIRONMENTAL TESPIT TP15

CLIENT The Ice Skating Club of NSW Cooperative
PROJECT Supplementary Contamination Assessr
PROJECT NUMBER 18587

CONTRACTOR Smartscan
EXCAVATOR OPERATOR PC
RIG TYPE 1.7T Excavator
TESTPIT SIZE 450mm

STARTED 21/01/2025
FINISHED 21/01/2025
LOGGED JP
CHECKED MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
	0.5		(FILL) Silty SAND, fine to medium grained, dark brown, trace rootlets, brick and clay, dry.	0.0-0.6 A	Fill No PACM, staining or odour noted. GRAV=13.1kg ACM=0g
			Silty CLAY, low to medium plasticity, pale brown mottled orange and grey, dry.		NATURAL No PACM, staining or odour noted.
	1		TP15 terminated at 0.9m bgl, target depth achieved		

alliance

ENVIRONMENTAL TESPIT TP16

CLIENT The Ice Skating Club of NSW Cooperative
PROJECT Supplementary Contamination Assessr
PROJECT NUMBER 18587

CONTRACTOR Smartscan
EXCAVATOR OPERATOR PC
RIG TYPE 1.7T Excavator
TESTPIT SIZE 450mm

STARTED 21/01/2025
FINISHED 21/01/2025
LOGGED JP
CHECKED MC

COMMENTS

Method	Depth (m)	Graphic Log	Material Description	Samples	Additional Observations
	0.5		(FILL) Silty SAND, fine to medium grained, dark brown, trace rootlets, clay and sandstone gravels, dry.	0.0-0.6 A	Fill No PACM, staining or odour noted. GRAV=12.5kg ACM=0g
			Silty CLAY, low to medium plasticity, pale brown, trace ironstone gravels, dry.		NATURAL No PACM, staining or odour noted.
	1		TP16 terminated at 0.9m bgl, target depth achieved		

APPENDIX H – Laboratory Documentation

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD
SUITE 710 / 90 GEORGE STREET, HORNSBY NSW 2077 – P.O. BOX 1644 HORNSBY WESTFIELD NSW 1635
PHONE: (02) 99872183 FAX: (02)99872151 EMAIL: info@ausset.com.au

CHAIN OF CUSTODY RECORD

ASET JOB NO: ASET123971/127151/1-8

Name/ Company Name: Alliance Geotechnical

Address: 10 Welder Road, Seven Hills NSW

Contact Ph: 0411 117 177 / 0401 014 313

Contact Name: James Petsas

Job No: 18587

Project Name: 17A Phillips Avenue, Canterbury

Purchase Order: 18587

Email Results to: jamespetsas@ / max@allgeo.com.au / jason@allgeo.com.au / samuelwillis@allgeo.com.au

	Sample ID	Date	Type	Container	Sample Location	Asbestos in Material	Asbestos in Soil (+/-)	Asbestos WA/ NEPM 500mL	Asbestos Fibre Count	Asbestos in Water	Asbestos in Dust	hold
1	TP09 0.0-0.5	21.01.2025	S	500ml				x				
2	TP10 0.0-0.4	21.01.2025	S	500ml				x				
3	TP11 0.0-0.4	21.01.2025	S	500ml				x				
4	TP12 0.0-0.6	21.01.2025	S	500ml				x				
5	TP13 0.0-0.6	21.01.2025	S	500ml				x				
6	TP14 0.0-0.4	21.01.2025	S	500ml				x				
7	TP15 0.0-0.6	21.01.2025	S	500ml				x				
8	TP16 0.0-0.6	21.01.2025	S	500ml				x				
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RECEIVED
21 JAN 2025
BY: SP

URGENT

Relinquished By: James Petsas

Date & Time: 21.01.2025

Signature:

Received By: SP

Date & Time: 2:35PM 21/01/25

Signature:

Turn around time					Shipment Method
Same Day	24 hrs	48 hrs	3 Days	5 days	Courier
	x				

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD
ABN 36 088 095 112

Our ref : ASET123971 / 127151 / 1 - 8
Your ref : 18587 - 17A Phillips Avenue Canterbury
NATA Accreditation No: 14484

22 January 2025

Alliance Geotechnical
10 Welder Road
Seven Hills NSW 2147

Accredited for compliance with ISO/IEC 17025 - Testing.

Attn: Mr James Petsas

Dear James

Asbestos Identification
This report presents the results of eight samples, forwarded by Alliance Geotechnical on 21 January 2025, for analysis for asbestos.

1.Introduction: Eight samples forwarded were examined and analysed for the presence of asbestos on 22 January 2025.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method **(Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction) (Qualitative Analysis only).**

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF**(Asbestos Fines), **FA**(Friable Asbestos) and **ACM** (Asbestos Containing Material), also satisfying the requirements of the NEPM Guidelines).

3. Results :

Sample No. 1. ASET123971 / 127151 / 1. 18587 - TP09 0.0-0.5.
Approx dimensions 10.0 cm x 10.0 cm x 7.8 cm
Approximate total dry weight of soil = 784.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of brick, glass, sandstone, wood chips and plant matter.
No asbestos detected.

Sample No. 2. ASET123971 / 127151 / 2. 18587 - TP10 0.0-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 7.5 cm
Approximate total dry weight of soil = 745.0g.
The sample consisted of a mixture of clayish sandy soil, stones, wood chips and plant matter.
No asbestos detected.

Sample No. 3. ASET123971 / 127151 / 3. 18587 - TP11 0.0-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 7.9 cm
Approximate total dry weight of soil = 790.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, wood chips and plant matter.
No asbestos detected.

Sample No. 4. ASET123971 / 127151 / 4. 18587 - TP12 0.0-0.6.
Approx dimensions 10.0 cm x 10.0 cm x 7.8 cm
Approximate total dry weight of soil = 783.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, sandstone, wood chips and plant matter.
No asbestos detected.

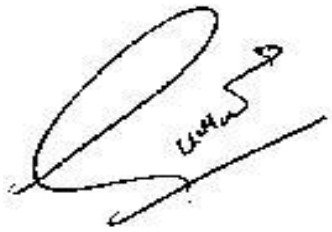
Sample No. 5. ASET123971 / 127151 / 5. 18587 - TP13 0.0-0.6.
Approx dimensions 10.0 cm x 10.0 cm x 7.6 cm
Approximate total dry weight of soil = 762.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of cement, plastic, sandstone, wood chips and plant matter.
No asbestos detected.

Sample No. 6. ASET123971 / 127151 / 6. 18587 - TP14 0.0-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 8.1 cm
Approximate total dry weight of soil = 813.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstone, wood chips and plant matter.
No asbestos detected.

Sample No. 7. ASET123971 / 127151 / 7. 18587 - TP15 0.0-0.6.
Approx dimensions 10.0 cm x 10.0 cm x 8.3 cm
Approximate total dry weight of soil = 827.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of ceramic tiles, sandstone, wood chips and plant matter.
No asbestos detected.

Sample No. 8. ASET123971 / 127151 / 8. 18587 - TP16 0.0-0.6.
Approx dimensions 10.0 cm x 10.0 cm x 8.0 cm
Approximate total dry weight of soil = 796.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of glass, sandstone, wood chips and plant matter.
No asbestos detected.

Reported by,



Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Identifier.
Approved Signatory

NATA
WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites

in Western Australia and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service.

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages if given.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

^ denotes loose fibres of relevant asbestos types detected in soil/dust.
*** denotes asbestos detected in ACM in bonded form.**
 # denotes friable asbestos as soft fibro plaster, fragments of ACM smaller than 7mm which are considered as friable and / or highly weathered ACM that will easily crumble.
λ denotes samples that have been analysed only in accordance to AS 4964 – 2004.
Ω Sample volume criteria of 500mL have not been satisfied.

The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by A4964-2004. Trace / respirable level asbestos will be reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.

Estimation of asbestos weights involves the use of following assumptions;
Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.

All samples indicating "No asbestos detected" are assumed to be less than 0.001% for friable AF and FA portions detected and 0.01 % for ACM detected unless the approximate weight is given.