

Prepared for
Systems Connect Line-wide

Prepared by
Ramboll Australia Pty Ltd

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318001281-001

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TO-105

SITE AUDIT REPORT

ROAD INFRASTRUCTURE

AT 1C SYDNEY STEEL

ROAD, MARRICKVILLE

7 June 2024

Systems Connect Line-wide
Attn.: Tristan McCormick
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North Sydney NSW 2060

By email: Tristan.McCormick@sclww.com.au

Dear Tristan

**SITE AUDIT REPORT - ROAD INFRASTRUCTURE AT 1C
SYDNEY STEEL ROAD, MARRICKVILLE**

I have pleasure in submitting the Site Audit Report for the subject site. The Site Audit Statement, produced in accordance with the NSW *Contaminated Land Management Act 1997*, is included as Appendix B of the Site Audit Report. The Audit was commissioned by Systems Connect Line-wide to assess the suitability of the site for its intended use as a road with landscaping (commercial/industrial land use).

The Audit was initiated to comply with a condition of the approval of State Significant Infrastructure (SSI) application 15_7400 issued on 9 January 2017 by the Minister for Planning and is therefore a statutory audit.

Thank you for giving me the opportunity to conduct this Audit. Please call me on 9954 8100 if you have any questions.

Yours faithfully,
Ramboll Australia Pty Ltd



Tom Onus
EPA Accredited Site Auditor 1505

cc: NSW EPA – Statement only
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CONTENTS

1.	INTRODUCTION	1
1.1	Audit Details	1
1.2	Project Background	1
1.3	Scope of the Audit	2
2.	SITE DETAILS	4
2.1	Location	4
2.2	Zoning	4
2.3	Adjacent Uses	4
2.4	Site Condition	4
2.4.1	Pre-Remediation	4
2.4.2	Post-Remediation	5
2.5	Completed Development	5
3.	SITE HISTORY	6
3.1	Auditor's Opinion	7
4.	CONTAMINANTS OF CONCERN	8
4.1	Auditor's Opinion	8
5.	STRATIGRAPHY AND HYDROGEOLOGY	9
5.1	Topography, Geology and Stratigraphy	9
5.2	Hydrogeology	9
5.3	Auditor's Opinion	10
6.	EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL	11
6.1	Auditor's Opinion	15
7.	ENVIRONMENTAL QUALITY CRITERIA	16
7.1	Soil Assessment Criteria	16
7.1.1	Human Health Assessment Criteria	16
7.1.2	Ecological Assessment Criteria	16
7.1.3	Soil Aesthetic Considerations	16
7.1.4	Imported Fill	16
7.2	Auditor's Opinion	17
8.	EVALUATION OF SOIL RESULTS	18
8.1	Field Results	18
8.2	Analytical Results	18
8.3	Auditor's Opinion	20
9.	EVALUATION OF GROUNDWATER RESULTS	21
9.1	Auditor's Opinion	22
10.	EVALUATION OF REMEDIATION	23
10.1	Previous Remediation Works (UST Removal)	23
10.1.1	Auditors Opinion	24
10.2	Pre-Remediation Conceptual Site Model and Remediation Required	24
10.3	Evaluation of RAP	25
10.4	Remedial Works Undertaken and Validation Activities	25
10.4.1	Remediation and Validation of Stockpile Removal	25
10.4.2	Installation and Validation of Marker Layer	25
10.4.3	Validation of Installed Capping	26
10.4.4	Material Disposed Off-Site	26
10.4.5	Imported Material	27
10.5	Auditor's Opinion	29
11.	CONTAMINATION MIGRATION POTENTIAL	30
12.	ASSESSMENT OF RISK	31
12.1	Auditors Opinion	31
13.	ONGOING SITE MANAGEMENT	32

13.1	Auditor's Opinion	35
14.	COMPLIANCE WITH REGULATORY GUIDELINES AND DIRECTIONS	36
14.1	General	36
14.2	Resilience and Hazards State Environment Planning Policy (2021)	36
14.3	Notification	36
14.4	Development Approvals	36
14.5	Duty to Report	37
14.6	Waste Management	37
14.6.1	Waste Classification	37
14.6.2	Waste Volumes, Disposal Receipts and Disposal Facilities	37
14.6.3	Auditor's Opinion	38
14.7	VENM and Other Imported Materials	38
14.8	Licenses	38
14.9	Conflict of Interest	38
15.	CONCLUSIONS AND RECOMMENDATIONS	39
16.	OTHER RELEVANT INFORMATION	40

LIST OF TABLES

Table 3.1: Site History	6
Table 4.1: Contaminants of Concern	8
Table 5.1: Stratigraphy	9
Table 6.1: Summary of Investigations and Remediation	11
Table 6.2: QA/QC – Sampling and Analysis Methodology Assessment	11
Table 6.3: QA/QC – Field and Lab Quality Assurance and Quality Control	13
Table 8.1: Evaluation of Soil Analytical Results – Summary Table	18
Table 10.1: Remediation Required and Preferred Options	25
Table 10.2: Imported Fill	27
Table 13.1: Assessment of the EMP	32
Table 14.1: Reports Anticipated by SEPP R&H	36

APPENDICES

Appendix A

Attachments

Appendix B

Site Audit Statement

Appendix C

Correspondence

LIST OF ABBREVIATIONS

Measures

%	per cent
µg/L	Micrograms per Litre
ha	Hectare
km	Kilometres
m	Metre
mbgl	Metres below ground level
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Litre
mm	Millimetre
ppm	Parts Per Million
w/w	weight for weight

General

ACL	Added Contaminant Limit
ACM	Asbestos Containing Material
ADE	ADE Consulting Group Pty Ltd
ADWG	Australian Drinking Water Guidelines
AF	Asbestos Fines
AHD	Australian Height Datum
Alliance	Alliance Geotechnical Pty Ltd
ALS	Australian Laboratory Services
ANZG	Australian & New Zealand Guidelines
ASET	Australian Safer Environment and Technology Pty Ltd. (Laboratory)
ASS	Acid Sulphate Soil
BaP	Benzo(a)pyrene
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes & Naphthalene
CCME	Canadian Council of Ministers of the Environment
CLM Act	NSW Contaminated Land Management Act 1997
COC	Chain of Custody
Council	Inner West Council
CSM	Conceptual Site Model
DA	Development Application
Douglas	Douglas Partners Pty Ltd
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
EMP	Environmental Management Plan
EPA	Environment Protection Authority (NSW)
EPL	Environment Protection Licence
ESL	Ecological Screening Level
FA	Fibrous Asbestos
GSW	General Solid Waste
HIL	Health Investigation Level
HSL	Health Screening Level
LCS	Laboratory Control Sample
LEP	Local Environment Plan
Metals	As: Arsenic, Cd: Cadmium, Cr: Chromium, Cu: Copper, Ni: Nickel, Pb: Lead, Zn: Zinc, Hg: Mercury
ML	Management Limits
MS	Matrix Spike
NATA	National Association of Testing Authorities
NC	Not Calculated
ND	Not Detected
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NL	Non-Limiting
n	Number of Samples

OCPs	Organochlorine Pesticides
OEH	Office of Environment and Heritage
OH&S	Occupational Health & Safety
OPPs	Organophosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PFAS	Per- and Poly-fluoroalkyl substances
pH	A measure of acidity, hydrogen ion activity
PID	Photoionisation Detector
PQL	Practical Quantitation Limit
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance/Quality Control
Ramboll	Ramboll Australia Pty Ltd – previously Ramboll Environ Australia Pty Ltd and ENVIRON Australia Pty Ltd
RAP	Remediation Action Plan
RPD	Relative Percent Difference
RRE	Resource Recovery Exemption
RRO	Resource Recovery Order
RSL	Regional Screening Level
SAQP	Sampling Analysis and Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
SCLW	Systems Connect Line-wide
SILs	Soil Investigation Levels
SMTF	Sydney Metro Train Facility South
SQG	Soil Quality Guidelines
TEQ	Toxic Equivalence Quotient
TPHs	Total Petroleum Hydrocarbons
TRHs	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UPSS	Underground Petroleum Storage System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VOCs	Volatile Organic Compounds
-	On tables is "not calculated", "no criteria" or "not applicable"

1. INTRODUCTION

1.1 Audit Details

A site contamination audit has been conducted in relation to a constructed road and associated landscaping area, which extends into a Sydney Metro stabling yard at 1C Sydney Steel Road, Marrickville NSW 2204 (Attachment 1, Appendix A).

The Audit was conducted to provide an independent review by an EPA Accredited Auditor of whether the land is suitable for any specified use or range of uses, i.e. a "Site Audit" as defined in Section 4 (1) (b) (iii) of the NSW *Contaminated Land Management Act 1997* (the CLM Act).

A State Significant Infrastructure (SSI) development application (SSI 15_7400) was approved by the NSW Minister for Planning on 9 January 2017 for the construction and operation of a metro rail line, approximately 16.5 km long (of which approximately 15.5 km is located in underground rail tunnels) between Chatswood and Sydenham, including the construction of a tunnel under Sydney Harbour, links with the existing rail network, seven metro stations and associated ancillary infrastructure. Condition E67 of the SSI development approval relates to contamination and requires a site audit as follows:

"If a Site Contamination Report prepared under Condition E66 finds such land contains contamination, a site audit is required to determine the suitability of a site for a specified use. If a site audit is required, a Site Audit Statement and Site Audit Report must be prepared by a NSW EPA Accredited Site Auditor. Contaminated land must not be used for the purpose approved under the terms of this approval until a Site Audit Statement is obtained that declares the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with."

The Audit was initiated to comply with condition E67 of the SSI approval and is therefore a statutory audit.

Details of the Audit are:

Requested by:	Tristan McCormick on behalf of Systems Connect Line-wide (SCLW)
Request/Commencement Date:	21 October 2022
Auditor:	Tom Onus
Accreditation No.:	1505

1.2 Project Background

As part of the Sydney Metro City and South West (Sydney Metro) Tunnel and Station Excavation (TSE) Works Package, remediation of off-site portions of 1C Sydney Steel Road was previously completed between 2018 and 2021 for a dive structure and culvert realignment works within the Proposed Marrickville Stabling Yard (referred to as the Sydney Metro Train Facility South (SMTF)). Remediation was undertaken generally by excavation and off-site disposal of all fill material and natural soil/bedrock (where required).

The Auditor prepared the following site audit reports (SARs) and site audit statements (SASs) related to the above remediation previously completed at the larger SMTF (not including the current audit site):

- 'Site Audit Report, Marrickville Dive, Murray Street, Marrickville NSW' and SAS TO-024-3 dated 18 September 2020. SAS TO-024-3 concluded that the auditable area was suitable for use as a dive structure for below ground train network.

- 'Site Audit Report, Auditable Areas of the Culvert Realignment and Associated Works – Sydney Metro Marrickville Stabling Yard' and SAS TO-024-7 dated 25 May 2021. SAS TO-024-7 concluded that the auditable areas were suitable for use as a Sydney Metro stabling yard and maintenance facility.

During ongoing construction of the stabling yard, an underground storage tank (UST) and friable asbestos impacted fill material were unexpectedly encountered within the north-western portion of the SMTF. Investigation and remediation of unexpected contamination was undertaken during development of the road and adjacent footpath and landscaping.

This audit was undertaken following remediation of the UST and asbestos impacted fill material to assess the suitability of the site for the proposed use. It does not consider the suitability of other areas of the SMTF.

1.3 Scope of the Audit

The scope of the Audit included:

- Review of the following reports:
 - 'Report on Preliminary Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Marrickville Dive, Murray Street, Marrickville', 21 March 2018, Douglas Partners Pty Ltd (Douglas) (*the PSI*).
 - 'Waste Classification Report', 30 May 2022, Alliance Geotechnical Pty Ltd (Alliance) (*WC Report 1*).
 - 'Waste Classification Report', 29 June 2022, Alliance (*WC Report 2*).
 - 'Waste Classification and Virgin Excavated Natural Material Report', 3 August 2022, Alliance Geotechnical Pty Ltd (Alliance) (*WC and VENM Report*).
 - 'Waste Classification Report', 15 September 2022, Alliance (*WC Report 3*).
 - 'Underground Petroleum Storage System, Tank Pit Validation, 1C Sydney Steel Road, Marrickville NSW 2204', 11 October 2022, Alliance (*UPSS Validation*).
 - 'Sampling & Analysis Quality Plan, Proposed Road Construction, 1C Sydney Steel Road, Marrickville NSW 2204', 21 October 2022, Alliance (*the SAQP*).
 - 'Detailed Site Investigation Report, Proposed Road Construction, 1C Sydney Steel Road, Marrickville NSW 2204', 16 November 2022, Alliance (*the DSI*).
 - 'Remedial Action Plan, Proposed Road Construction, 1C Sydney Steel Road, Marrickville NSW 2204', 25 November 2022, Alliance (*the RAP*).
 - 'Site Remediation and Validation Report, Proposed Road Construction, Portion 1C Sydney Steel Road, Marrickville NSW 2204' 22 September 2023, Alliance (*the Validation Report*).
 - 'Environmental Management Plan, Road Infrastructure Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204', 13 March 2024, Alliance (*the EMP*).
 - 'Mulch Inspection and Analysis Assessment, Marrickville Stabling Yard, 36 Murray Street, Marrickville, NSW 2204', 23 May 2024, ADE Consulting Group Pty Ltd (ADE) (*the MIAA*).
- Site visits by the Auditor on 6 March 2020, 14 May 2021 and 25 August 2023.
- Discussions with SCLW and with Alliance who undertook the investigations and remediation.

The waste classification reports completed in 2022 and the UPSS Validation report were completed prior to the Auditor's engagement and no discussion with Alliance was undertaken regarding the proposed scope of work or results.

I reviewed the key documents against the requirements of guidelines made or approved under Section 105 of the CLM Act, including the following:

- Chapter 4 Remediation of Land in the Resilience and Hazards State Environment Planning Policy (SEPP) 2021 (formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) '*Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land*'.
- NSW EPA (2017) '*Guidelines for the NSW Site Auditor Scheme (3rd Edition)*'.
- NSW EPA (2020) '*Contaminated Land Guidelines, Consultants Reporting on Contaminated Land*'.
- National Environment Protection Council (NEPC) '*National Environment Protection (Assessment of Site Contamination) Measure 1999*', as Amended 2013 (NEPM, 2013).
- Australia and New Zealand Heads of EPAs (HEPA 2020) '*PFAS National Environmental Management Plan, Version 2.0*' (NEMP).

2. SITE DETAILS

2.1 Location

The site locality is shown on Attachment 1, Appendix A.

The site details are as follows:

Street address:	Part of 1C Sydney Steel Road, Marrickville NSW 2204
Identifier:	Part Lot 1 DP613757
Local Government:	Inner West Council
Owner:	Transport for New South Wales
Site Area:	Approximately 1,948 m ²

The boundaries of the site are not visually obvious. A survey plan of the site boundaries has been provided in the SAS in Appendix B.

2.2 Zoning

The current zoning of the site is IN1 General Industrial under the Inner West Local Environment Plan (LEP) 2022.

2.3 Adjacent Uses

The site is located within an area of commercial/industrial use. The surrounding site use includes:

Northeast: Sydney Steel Road, the SMTF and commercial/industrial facilities.

Northwest: Stormwater easement, then offsite commercial/industrial facilities.

Southeast: The SMTF, then the railway corridor.

Southwest: The Sydenham Pit and Drainage Pumping Station (No. 001) and commercial/industrial facilities.

A concrete lined stormwater drain is located within the SMTF to the east of the site which drains into the Sydenham Pit and Drainage Pumping Station located adjacent to the southwest boundary. Alliance identified the closest sensitive ecological receptor for groundwater as Alexandra Canal (1.4 km southeast) and the Cooks River (2 km southwest).

The PSI identified several potential offsite sources of contamination, including former brick pits located to the southeast (~250 m) and east (~550 m), former (between 1950 and 1970) dry cleaners, motor garages and service stations within 500 m up-gradient of the site. A search of the NSW EPA list of notified contaminated sites include a number of sites within a 500 m radius of the site (discussed in Section 3). Potential sources of contamination were also identified within the SMTF, including USTs and former commercial/industrial uses (Attachment 2, Appendix A).

2.4 Site Condition

2.4.1 Pre-Remediation

Douglas inspected the larger Sydney Metro Marrickville site (including the current site) for the PSI on 20 September 2017 and noted the following:

- The proposed SMTF comprised a number of different Lots. The majority of the Lots were vacant with demolition of former buildings underway in some lots. An electrical substation was located to the west of the site.
- The majority of the site was paved with asphalt and concrete. Murray Street crossed through the north section of the proposed SMTF.

- Fill/dip points for underground fuel storage tanks (USTs) (Attachment 2, Appendix A) were located at the site and adjacent areas of the proposed SMTF.
- A concrete lined drainage channel was located within the SMTF site which ran from north to west and drained into the Sydenham Pit and Drainage Pumping Station located to the southwest.

Douglas inspected the site on 6 November 2019 and noted that the larger Sydney Metro Marrickville site, which comprised the SMTF and dive structure, was being used to cast and store concrete panels for use in the tunnels, to store spoil from tunnelling, for site sheds, internal roads, parking and general storage.

Pre-remediation site conditions were reported by Alliance in the Validation Report and UPSS Validation Report. The following is a summary of observations reported by Alliance:

- At the time of the DSI fieldworks the site was unoccupied, appearing vacant. Earthworks had been carried out on the site, with no vegetation observed. The site surface was unsealed with exposed soils visible and there were no buildings.
- The DSI reported two stockpiles at the site including a stockpile of concrete (approximately 60 m³) and a stockpile of soil (approximately 100 m³).
- An underground storage tank (UST) was identified during early earthworks in the north-eastern portion of the site. The UST was documented in the UPSS Validation report to be approximately 10 m by 2 m and contained liquid. Alliance observed pipework associated with the UST to be within the UST footprint.

2.4.2 Post-Remediation

Alliance noted in the Validation Report that following remediation works the site was covered with landscaped grass and shrubs along the north-western and south-eastern boundaries of the site, while the central portion of the site was covered with asphalt road pavement.

The Auditor noted similar site conditions during the site visit on 25 August 2023, however, minor quantities of engineered wood products and anthropogenic wastes (glass, plastic, PVC pipe) were observed within the mulch material placed in the landscaped areas.

2.5 Completed Development

The site has been developed as an asphalt paved road and adjacent landscaping. The road portion of the site will be used by metro train maintenance facility workers to access the maintenance facility.

For the purposes of this audit, the 'commercial/industrial' land use scenario will be assumed as only maintenance workers are likely to interact with sub-surface materials.

It is noted that the Validation Report assumed a 'public open space' land use as the site may be used by pedestrians. This has not been adopted by the Auditor as it is considered overly conservative given that the public is unlikely to use the landscaped road verge for recreational purposes.

3. SITE HISTORY

The PSI site history assessment for the greater SMTF area included a review of historical title deeds, aerial photographs, historical business directories, NSW EPA records and Section 149 (now Section 10.7) certificates. The site history for the SMTF area is summarised in Table 3.1.

Table 3.1: Site History

Date	Activity
1907 – 1930s	The site was mostly vacant with one commercial/industrial structure in the northeast. Various smallhold proprietors were noted on the title records.
1930s – 1950s	Additional industrial development of the site and surrounding area had occurred. Some sections of the site were used for materials storage. Camdenville Park brickworks and other brick pits were noted in the immediate surrounds.
1950s – 2000	Further industrial development of the site resulted in the entire area being covered by structures. A review of title records indicated that the site operated as a steel manufacturing facility. Various industries were operational at adjacent sites including chemical manufacturing, metal works, dyers/bleachers, construction equipment, refrigeration, electrical equipment and air-conditioning, boilermakers, engineering firms, fuel merchants, foundries, printers, electroplaters, motor panel beaters/wreckers/painters and tyre dealers. Camdenville Park brickworks had been infilled and developed as a park.
2000 – 2017	Redevelopment of the site occurred around 2000, however the land use remained commercial/industrial (owned by Newtown Dyers and Bleachers).
2017 to date	The site is currently owned and occupied by Transport for NSW for the metro development. Demolition of buildings occurred in 2017. The site was used for material storage and site sheds during development of the Sydney Metro.

The summary indicates that the site has been used for commercial/industrial purposes since the 1930s.

A search request to SafeWork NSW for information on the storage of dangerous goods was not undertaken for the site, however a potential fill point was observed during the PSI (Attachment 2, Appendix A). Review of dangerous goods records for the remainder of the SMTF identified USTs at 50-52 Murray Street, and LPG gas cylinder and UST (abandoned in-situ with sand and concrete slurry) at 2 Edinburgh Road.

A review of the NSW EPA public records indicates three properties located close to the site notified as contaminated to the EPA. The properties include: Camdenville Park (May Street, St Peters), Marrickville Metro Shopping Centre (34 Victoria Road) and rail land (117 Railway Parade).

Former brick pits located to the southeast (~250 m) and east (~550 m) of the site were identified as potential sources of contamination in the PSI. The PSI summarised investigations previously undertaken by EES at Camdenville Park (former brick pit to the east) in 2006-2007 which identified elevated levels of methane (CH₄) associated with landfilling of the former brick pit. The Auditor notes that landfill gas conditions at the SMTF were assessed during investigation and remediation of the dive structure, which was reviewed in TO-024-3 and concluded that the data *"did not identify concentrations and flow rates of ground gases that would indicate a significant risk to future site users. Potential risks are further reduced at the site as a result of the adjacent dive structure development, which is an open void that would eliminate the potential for migration onto the site"*.

The PSI stated that the VOC groundwater plume at the Marrickville Metro Shopping Centre site is localised with low risk of migration onto the subject site, and the SRA Land is located downgradient of the site.

3.1 Auditor's Opinion

In the Auditor's opinion, the site history provides an adequate indication of past on-site and off-site activities that may have resulted in site contamination. Details of specific site operations were not provided, such as chemical use and storage locations, however this uncertainty has been addressed through the investigation data obtained. The Auditor considers that the site history is broadly understood and adequate for identification of contaminants of concern (Section 4) and remedial planning (Section 10).

4. CONTAMINANTS OF CONCERN

The Alliance SAQP provided a list of contaminants of concern and potentially contaminating activities. These have been tabulated in Table 4.1.

Table 4.1: Contaminants of Concern

Area	Activity	Potential Contaminants
Entire Site	Fill and surface soil imported from unknown sources to form/level the site. Demolition of former buildings. Former commercial/industrial land use.	Total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylenes & naphthalene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), per- and poly-fluoroalkyl substances (PFAS), phenols, metals, cyanide, dioxins and asbestos.

Based on the results of the DSI, the RAP defined the contaminants of concern for remediation/validation as bonded and friable asbestos and carcinogenic PAHs (assessed as benzo(a)pyrene toxic equivalence quotient (TEQ)) within fill material.

4.1 Auditor’s Opinion

The Auditor considers that the analyte list used by Douglas and Alliance adequately reflects the site history and condition.

The SAQP did not list contaminants associated with the UST as it had already been removed and validated, however would include TPH, BTEX, PAHs and lead if used for petrol or diesel.

There has been a limited assessment by the consultants for the presence of per- and poly-fluoroalkyl substances (PFAS) but in the Auditor’s opinion there are no indications in the site history that they would be potential contaminants of concern.

5. STRATIGRAPHY AND HYDROGEOLOGY

5.1 Topography, Geology and Stratigraphy

The PSI reported that the site is located in a relatively low-lying area of Marrickville at approximately 6 m Australian Height Datum (AHD) with a slight slope to the southwest. The site is underlain by stream, alluvial and estuarine sediments and by deeper Ashfield Shale which comprises black to dark grey shale and laminite (Sydney 1:100,000 Geology Sheet).

The PSI reported that the site is within an area of no known occurrences of acid sulfate soils (ASS). The NSW Acid Sulfate Soil (ASS) Risk Map shows that the site is disturbed terrain. Samples of fill, natural soil and bedrock were assessed for ASS during investigation of the larger SMTF. These results were reviewed for TO-024-3 and TO-024-7 and it was concluded that ASS was not present and that an ASS Management Plan was not required.

Alliance undertook 27 test pits during the WC and VENM Report and DSI. The sub-surface profile of the site prior to remediation is summarised by the Auditor in Table 5.1.

Table 5.1: Stratigraphy

Depth (mbgl)	Subsurface Profile
0.0 – 1.0	Fill material comprising gravelly sand, with some clay and shale. Anthropogenic material included terracotta, bricks, concrete, ceramic pipe, glass, ash, metal, wood and fragments of potential asbestos containing material (ACM). Concrete pavements (0-0.2 mbgl) were observed at locations in the north of the site.
1.0 to termination depth (2.8 mbgl)	Natural clay with trace sand

mbgl – metres below ground level

During investigation of the SMTF, weathered shale bedrock was identified underlying natural clay at a depth of 6 to 7 mbgl.

Remediation of the site resulted in the offsite disposal of some fill material and the onsite containment of residual fill material (discussed in Section 10). Approximately 0.5 m of fill material remained across the majority of the site following remediation, with a greater thickness in the north (approximately 1 m) and south (approximately 2 m). Fill material was capped below 0.54 m of imported materials to achieve site levels and construct the final finished surfaces.

5.2 Hydrogeology

A search of online records held by the NSW Office of Water was performed by the Auditor on 13 February 2024 which indicated that there were no licensed groundwater bores located within 500 m of the site boundary.

The PSI concluded that based on the topography, groundwater is anticipated to flow to the southwest. Groundwater flow would be impacted by a concrete lined drainage channel within the SMTF to the east of the site which drains into the Sydenham Pit and Drainage Pumping Station (No. 001) located to the southwest of the site. DP identified the closest sensitive ecological receptor for groundwater as the Cooks River, located approximately 2 km to the southwest. Surface water run-off is anticipated to flow into the local stormwater network.

Previous investigations of the SMTF included installation and sampling of groundwater monitoring wells, which identified groundwater at between 1.7 to 4.6 mbgl and a flow direction towards the southeast. Field records of groundwater parameters recorded during sampling indicated that the pH was 4.4 to 5.7, dissolved oxygen (DO) was 1.0 to 2.6 mg/L, redox potential was 3 to 1208 mV, and electrical conductivity (EC) was 0.8 to 8.1 mS/cm.

Further assessment of groundwater was not undertaken during investigation and remediation of the site.

5.3 Auditor's Opinion

The Auditor considers that the site stratigraphy and hydrogeology conditions adequately reflect the site conditions and are sufficiently well known for assessing site suitability.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The Auditor has assessed the overall quality of the data by review of the information presented in the referenced reports, supplemented by field observations. The data sources are summarised in Table 6.1.

Table 6.1: Summary of Investigations and Remediation

Stage of Works	Field Data	Analytical Data
PSI (Douglas, 2018)	Site inspection only, no sampling	None
WC and VENM Report (Alliance, 2022) <i>Fieldwork date: July 2022</i>	14 test pits (TP1 to TP14) excavated on systematic grid for site coverage.	Soil: TRH, BTEX, PAH, OCP, PCB, metals and asbestos (% w/w)
WC Report (Alliance, 2022) <i>Fieldwork date: September 2022</i>	Four samples (0909-SP1-1 to 0909-SP1-4) from an approximate 100 m ³ stockpile generated during UST removal	Soil: TRH, BTEX, PAH, OCP, PCB, metals and asbestos (% w/w)
UPSS Validation (Alliance, 2022) <i>Fieldwork date: September 2022</i>	14 validation soil samples following UST removal (VS-A to VS-N). One sample of surface water ponded within UST pit following removal (purpose not stated).	Soil and Water: Metals, TRH, BTEX, PAHs, phenols, VOCs, ethanol and asbestos (% w/w) (soil only)
DSI (Alliance, 2022) <i>Fieldwork date: October 2022</i>	13 test pits (TP101 to TP106, TP1A, TP3A, TP5A, TP7A and TP10A to TP12A) excavated on a systematic grid pattern and between previous locations for site coverage.	Soil: TRH, BTEX, PAHs, phenols, VOCs, OCPs, PCBs, PFAS, metals, cyanide and asbestos (10 L and 500 mL samples % w/w)
Validation Report (Alliance, 2023) <i>Fieldwork date: December 2022 and February 2023</i>	26 sample locations targeting two stockpiles of imported tunnel spoil: 16 from SP1 (1,100 m ³) and 10 from SP2 (260 m ³) Four validation soil samples targeted to the imported topsoil/growing media (210.98 tonnes)	Tunnel spoil: Metals, TRH, BTEX, PAHs, OCPs, PCBs, asbestos (10 L and 500 mL samples % w/w) Topsoil: Metals, OCPs and asbestos (presence/absence)
MIAA (ADE, 2024) <i>Fieldwork date: May 2024</i>	60 sample locations (TP1 to TP60) on a systematic grid pattern excavated within landscaped areas of the Marrickville Stabling Yard. 13 sample locations (TP47 to TP59) were located within or in the vicinity of the site. 10 Litre bulk samples were obtained from the upper 0.1 m of mulch at each location and spread evenly across a high contrast surface for inspection.	-

The Auditor’s assessment of data quality follows in Tables 6.2 and 6.3.

Table 6.2: QA/QC – Sampling and Analysis Methodology Assessment

Sampling and Analysis Plan and Sampling Methodology	Auditor’s Opinion
<p><i>Data Quality Objectives (DQO)</i></p> <p>Alliance defined specific DQOs in accordance with the seven-step process outlined in Schedule B2 of NEPM (2013) for the UPSS Validation, SAQP prepared for the DSI and the RAP prepared for validation of the site.</p> <p>The following decisions for the RAP were identified in the DQOs:</p>	<p>The identified DQOs were considered appropriate for the investigations and validation conducted. Although the MIAA did not include DQOs, the objectives of the assessment were included in the report and were considered appropriate for the investigation undertaken.</p>

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<ul style="list-style-type: none"> Is the data collected for the project, suitable for assessing land contamination exposure risks in imported materials? Do the detected concentrations of contaminants of potential concern identified for the relevant imported materials, 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? <p>DQOs were not specified by ADE for the MIAA.</p>	
<p><i>Sampling pattern and locations</i></p> <p><i>Soil:</i> Investigation locations were generally placed on a systematic sampling pattern and spaced to gain coverage of the majority of the site. The various fill and natural materials at the site were also targeted for sampling. The placed imported mulch was targeted in the MIAA.</p> <p>UPSS validation samples targeted the walls and base of the UST pit.</p> <p>Stockpiles were targeted for sampling including validation of imported materials.</p> <p><i>Surface water:</i> ponding surface water in the UST pit was sampled.</p>	<p>In the Auditor's opinion these sample locations adequately target the main areas of concern.</p>
<p><i>Sampling density</i></p> <p><i>Soil:</i> The combined investigation sampling density of 31 locations over approximately 0.2 ha exceeds the minimum recommended (8 for a 0.2 ha site) by EPA (2022) <i>Sampling Design Part 1 - Application</i>. The coverage provides a 95% confidence of detecting a residual hot spot of approximately 9.4 m diameter.</p> <p>Asbestos sampling during the waste classifications and UPSS Validation was not undertaken according to the methodology outlined in NEPM (2013) (Schedule B1). The asbestos sample methodology adopted during the DSI and the validation of imported materials was in accordance with NEPM (2013). The density of 13 samples for the DSI is below the recommended sample density for a 'Likely' likelihood of asbestos in Table 1 WA DoH (2009).</p> <p><i>UPSS Validation:</i> A total of 14 samples were obtained from the exposed soils within the excavation base and walls.</p> <p><i>Imported Materials:</i> A total of 30 primary samples were obtained from the two sources/material types imported to the site. The primary sampling was undertaken at the following frequencies:</p> <ul style="list-style-type: none"> Tunnel spoil: 1 per 52.3 m³ Topsoil/growing media: 1 per 52.75 tonnes <p>Thirteen samples were collected from imported mulch placed within landscaped areas (1 per 12 m³).</p> <p><i>Surface water:</i> One grab sample was obtained from the ponding water within the UST removal pit.</p>	<p>In the Auditor's opinion the sampling density was appropriate.</p>
<p><i>Sample depths</i></p> <p>Samples were collected and analysed from a range of depths, with the primary intervals being within the shallow fill (0-0.2 m bgl). Additional samples of fill were also obtained at and around every 0.5 to 1 m and the underlying natural soils.</p> <p>Samples from stockpiles (including imported materials) were obtained at least 0.3 m below the surface of the stockpile.</p> <p>Samples of placed imported mulch were obtained from the surface down through the full thickness of the profile.</p>	<p>In the Auditor's opinion, this sampling strategy was appropriate and adequate to characterise the primary material types present on site.</p>

Sampling and Analysis Plan and Sampling Methodology	Auditor’s Opinion
<p>Validation samples collected from the walls and floor of the excavation with sample depths ranging from 0.5 and 2.8 mbgl.</p>	
<p><i>Sample collection method</i> <i>Soil:</i> Samples were collected by hand, either directly from the stockpiled soil, excavation or from the excavator bucket. Samples were collected with a fresh pair of nitrile gloves. 500 mL samples were collected for laboratory analysis for asbestos fines/fibrous asbestos (AF/FA). 10 L samples were obtained during the DSI and subject to a gravimetric assessment using a 7 mm sieve in the field in accordance with NEPM (2013) (Schedule B1). 10 L samples obtained during the MIAA were spread across a high contrast surface and inspected for ACM. <i>Surface water:</i> Not specified however likely to be directly into laboratory supplied containers and/or bailer.</p>	<p>Sample collection from the test pits is not ideal as it can result in loss of volatiles and sample cross contamination. Overall, in the context of the remediation works undertaken, the sample collection method was found to be acceptable.</p>
<p><i>Decontamination procedures</i> Alliance reported that re-usable sampling equipment was not used. Samples were collected directly from the stockpiles of excavated soil/excavation or excavator bucket using a fresh pair of nitrile gloves for each sample.</p>	<p>Acceptable</p>
<p><i>Sample handling and containers</i> Samples were placed into prepared and preserved sampling containers provided by the laboratory and chilled during storage and subsequent transport to the labs. Samples for asbestos analysis were placed in plastic zip-lock bags.</p>	<p>Acceptable</p>
<p><i>Chain of Custody (COC)</i> Completed COC forms were provided in the reports.</p>	<p>Acceptable</p>
<p><i>Detailed description of field screening protocols</i> <i>Soil:</i> Field screening for volatiles was undertaken using a PID. Soil sub-samples were placed in ziplock plastic bags and the headspace measured for VOCs after allowing time for equilibration. <i>Surface water:</i> Field parameters were not measured during sampling.</p>	<p>Acceptable</p>
<p><i>Calibration of field equipment</i> The reports indicated that calibration had been undertaken prior to use. Calibration certificates from the equipment supplier were provided in the UPSS Validation report, DSI and Validation Report.</p>	<p>Acceptable</p>
<p><i>Sampling logs</i> Soil logs are provided within the DSI report only, indicating sample depth, PID readings and lithology. The logs reported indications of contamination including anthropogenic inclusions and hydrocarbon odours in select locations. A brief description of samples was provided in the UPSS Validation report. Surface water field sampling records were not provided.</p>	<p>Acceptable in the context of the data set.</p>

Table 6.3: QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Auditor’s Opinion
<p><i>Field quality control samples</i> Field quality control samples including trip blanks, trip spikes, field intra-laboratory and inter-laboratory duplicates were undertaken.</p>	<p>Acceptable</p>

Field and Lab QA/QC	Auditor's Opinion
<p>No trip blanks, trip spikes, rinsate blanks or field inter-laboratory duplicates were obtained during the waste classification assessments.</p> <p>Rinsate blanks were not required since dedicated sampling equipment was used for each location.</p>	
<p><i>Field quality control results</i></p> <p>The results of field quality control samples were generally within appropriate limits. It was noted that RPDs for two intra and two inter-laboratory soil duplicates exceeded adopted limits for metals (lead and zinc) and PAHs. Alliance noted that the primary samples were not homogenised and the elevated RPDs were likely associated with sample heterogeneity. As a conservative measure the higher results were adopted as the primary result.</p>	<p>Overall, in the context of the dataset reported, the elevated RPD results are not considered significant and the field quality control results are acceptable.</p>
<p><i>NATA registered laboratory and NATA endorsed methods</i></p> <p>Laboratories used included: Eurofins mgt (primary), ASET (asbestos) and ALS (secondary). Laboratory certificates were NATA stamped.</p>	<p>Acceptable</p>
<p><i>Analytical methods</i></p> <p>Analytical methods were included in the laboratory test certificates. The laboratories provided brief method summaries of in-house NATA accredited methods used based on USEPA and/or APHA methods (excluding asbestos) for extraction and analysis in accordance with the NEPM (2013).</p> <p>Asbestos identification was conducted using polarised light microscopy with dispersion staining by method AS4964-2004 <i>Method for the Qualitative Identification of Asbestos Bulk Samples</i>.</p>	<p>The analytical methods are considered acceptable for the purposes of the site audit, noting that the AS4964-2004 is currently the only available method in Australia for analysing asbestos. DOH (2009) and enHealth (2005) state that "until an alternative analytical technique is developed and validated the AS4964-2004 is recommended for use".</p>
<p><i>Holding times</i></p> <p>Review of the COCs and laboratory certificates indicate that the holding times had been met. Alliance also reported that holding times were met.</p>	<p>Acceptable</p>
<p><i>Practical Quantitation Limits (PQLs)</i></p> <p><i>Soil:</i> PQLs (except asbestos) were less than the threshold criteria for the contaminants of concern.</p> <p><i>Asbestos:</i> The NATA approved limit of detection for asbestos in soil was 0.01% w/w although NEPM (2013) analyses were reported to 0.001% w/w for AF/FA.</p> <p><i>Surface water:</i> The following trigger values were less than the PQLs:</p> <ul style="list-style-type: none"> • Anthracene 1 µg/L, trigger value 0.01 µg/L • Phenanthrene 1 µg/L, trigger value 0.6 µg/L • Benzo(a)pyrene 1 µg/L, trigger value 0.1 µg/L 	<p><i>Soil (except asbestos):</i> Overall the soil PQLs are acceptable.</p> <p><i>Asbestos:</i> In the absence of any other validated analytical method, the detection limit for asbestos is considered acceptable.</p> <p><i>Surface water:</i> The elevated PQLs were only marginally elevated above the trigger values and in the context of the results reported and remediation works undertaken, overall these discrepancies do not materially affect the outcome of the audit.</p>
<p><i>Laboratory quality control samples</i></p> <p>Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks and duplicates were undertaken by the laboratory.</p>	<p>Acceptable</p>
<p><i>Laboratory quality control results</i></p> <p>The results of laboratory quality control samples were generally within appropriate limits, with the following exceptions:</p> <ul style="list-style-type: none"> • TRH and PAH RPD results were above the criteria in two laboratory duplicate samples. However, the RPD reported passes the primary laboratory testing's QC-Acceptance Criteria. • An elevated matrix spike was reported for PAHs in one sample. The matrix spike recovery was outside of the recommended acceptance criteria. An acceptable recovery 	<p>In the context of the dataset reported, the elevated RPDs and spike recoveries are not considered significant and the laboratory quality control results are acceptable.</p>

Field and Lab QA/QC	Auditor's Opinion
<p>was obtained for the laboratory control sample indicating a sample matrix interference.</p>	
<p><i>Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy)</i></p> <p>Predetermined data quality indicators (DQIs) were set for laboratory analyses including blanks, replicates, duplicates, laboratory control samples, matrix spikes and surrogate spikes. These were discussed with regard to the five category areas.</p> <p>Alliance made the following DQI assessment conclusion in the UPSS Validation and DSI <i>"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."</i></p>	<p>An assessment of the data quality with respect to the five category areas has been undertaken by the Auditor and is summarised below.</p>

6.1 Auditor's Opinion

In considering the data as a whole, the Auditor concludes that:

- The data is likely to be representative of the overall conditions at the site.
- The data is considered adequately complete.
- There is a high degree of confidence that data is comparable for each sampling and analytical event.
- The laboratories have provided sufficient information to conclude that data is of sufficient precision.
- While most of the data is likely to be accurate, there is some doubt regarding possible loss of volatiles from sampling of open test pits and this has been considered in the interpretation of results.

7. ENVIRONMENTAL QUALITY CRITERIA

The Auditor has assessed the results against Tier 1 criteria from NEPM (2013). Other guidance has been adopted where NEPM (2013) is not applicable or criteria are not provided. Based on the proposed development (road and adjacent landscaping) and the site being within the SMTF and only accessible by workers at the maintenance facility, the human health and ecological criteria for 'commercial/industrial' were adopted.

7.1 Soil Assessment Criteria

7.1.1 Human Health Assessment Criteria

The Auditor has adopted human health assessment criteria from the following sources:

- NEPM (2013) Health Investigation Levels (HILs) for 'Commercial/Industrial' (HIL D) land use.
- NEPM (2013) Health Screening Levels (HSLs) for 'Commercial/Industrial' (HSL D) land use. The HSLs assumed a clay soil type.
- NEPM (2013) Management Limits (MLs) for petroleum hydrocarbons for 'Commercial/Industrial' land use and assuming fine soil texture.
- NEPM (2013) HSLs for Asbestos Contamination in Soil for 'Commercial/Industrial' (HSL D) land use.
- HEPA (2020) PFAS National Environmental Management Plan Version 2.0. PFOS/PFHxS and PFOA soil criteria developed for 'commercial/industrial' land use. The PFOS/PFHxS criteria is compared to the sum of the PFOS and PFHxS concentrations.

7.1.2 Ecological Assessment Criteria

The Auditor has adopted ecological soil assessment criteria from the following sources:

- NEPM (2013) Ecological Screening Levels (ESLs) for 'Commercial/Industrial' land use, assuming fine soil.
- NEPM (2013) Ecological Investigation Levels (EILs) for 'Commercial/Industrial' land use. In the absence of site-specific soil data on pH, clay content, cation exchange capacity and background concentrations, the published range of the added contaminant limits have been applied as an initial screen.
- Canadian Council of Ministers of the Environment (CCME) (2010) *Canadian soil quality guidelines: carcinogenic and other polycyclic aromatic hydrocarbons (PAHs) soil quality guideline (SQG) for benzo(a)pyrene* for 'Commercial/Industrial' land use. The SQG has been adopted in place of the NEPM (2013) ESL as it is based on a larger and more up-to-date toxicity database than the low reliability NEPM (2013) ESL.
- HEPA (2020) PFOS and PFOA soil 'ecological direct exposure' and 'ecological indirect exposure' criteria.

7.1.3 Soil Aesthetic Considerations

The Auditor has considered the need for soil remediation based on 'aesthetic' contamination as outlined in *Section 3.6 Aesthetic Considerations* of NEPM (2013) Schedule B1, which acknowledges that there are no chemical-specific numerical aesthetic guidelines. Instead, site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

7.1.4 Imported Fill

Imported fill has been assessed in relation to attributes expected of virgin excavated natural material (VENM). The NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* defines VENM as "...natural material (such as clay, gravel, sand, soil or rock fines):

- *'that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities*
- *'that does not contain sulphidic ores or soils, or any other waste, and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice in the NSW Government Gazette.'*

On this basis, the Auditor considers that for soil to be classified as VENM, the following criteria generally apply:

- Organic compounds (including petroleum hydrocarbons, PAHs, OCPs, PCBs and phenols) should be less than the PQLs.
- Inorganic compounds should be consistent with background concentrations.
- The material should not contain or comprise actual or potential acid sulphate soil.

Imported material, such as excavated natural material (ENM) or mulch, was assessed against the requirements of the applicable resource recovery order (RRO) and resource recovery exemption (RRE) issued by the EPA under clause 93 of the *Protection of the Environment Operations (Waste) Regulation 2014*.

7.2 Auditor's Opinion

The environmental quality criteria referenced by the Auditor are consistent with those adopted by Alliance, with the exception of the following:

- Alliance adopted a 'public open space' land use scenario based on the site being used by pedestrians. This has not been adopted by the Auditor as it is considered overly conservative given that the public is unlikely to use the landscaped road verge for recreational purposes.

8. EVALUATION OF SOIL RESULTS

A summary of the soil investigations undertaken is provided in Table 6.1. The results of these investigations are discussed below. Results for the UPSS validation are discussed in Section 10.1.

8.1 Field Results

Fill material was found to contain anthropogenic material including metal, concrete fragments, terracotta bricks, boiler ash, wood, geotextile fabric, ACM and fragments of glass, tile and ceramic pipe.

PID readings were between 1.5 ppm and 10.6 ppm, indicating a low potential for significant volatile hydrocarbon contamination. Olfactory evidence of a moderate to strong hydrocarbon odour was detected in soil samples collected from TP11A at depths of between 0.1 m and 0.5 m, which reported PID readings of 4.5 to 5.9 ppm. No staining was noted by Alliance.

8.2 Analytical Results

The analytical results have been assessed against the environmental quality criteria and are summarised in Table 8.1. Soil sampling locations are shown on Attachment 3, Appendix A (note that the site boundary is approximate and not consistent with the survey).

Table 8.1: Evaluation of Soil Analytical Results – Summary Table

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
ACM >7 mm (10 L samples)	16	0	<PQL	0 above HSL D 0.05%	-
AF/FA (500 mL samples)	35	7	0.21%	4 above HSL 0.001%	-
Asbestos in material	4	4	Detected	4 fragments contained asbestos	-
BTEXN	20	0	<PQL	0 above HSL D (clay)	0 above ESL (fine)
F1 (TRH C ₆ -C ₁₀ minus BTEX)	16	0	<PQL	0 above HSL D 0-1 m, clay 310 mg/kg	0 above ESL (fine) 215 mg/kg
F2 (TRH >C ₁₀ -C ₁₆ minus naphthalene)	16	0	<PQL	0 above HSL D 0-1 m, clay NL	-
TRH C ₆ -C ₁₀	16	0	<PQL	0 above ML (open space) 800 mg/kg	-
TRH >C ₁₀ -C ₁₆	16	0	<PQL	0 above ML (open space) 1000 mg/kg	0 above ESL (fine) 170 mg/kg
TRH >C ₁₆ -C ₃₄	16	3	760	0 above ML (open space) 5000 mg/kg	0 above ESL (fine) 2500 mg/kg
TRH >C ₃₄ -C ₄₀	16	1	230	0 above ML (open space) 10,000 mg/kg	0 above ESL (fine) 6600 mg/kg
Benzo(a)pyrene	19	5	17	-	0 above CCME SQG 72 mg/kg
Benzo(a)pyrene TEQ	19	5	27	0 above HIL D 40 mg/kg	-
Total PAHs	19	8	210	0 above HIL D 4000 mg/kg	-
Total Phenols	10	0	<PQL	0 above HIL D 240,000 mg/kg	-
Arsenic	18	17	50	0 above HIL D 3000 mg/kg	0 above EIL 160 mg/kg

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
Cadmium	18	7	3.7	0 above HIL D 900 mg/kg	-
Chromium	18	18	48	0 above HIL D 3600 mg/kg	0 above most conservative ACL 310 mg/kg
Copper	18	16	1100	0 above HIL D 240,000 mg/kg	6 above most conservative ACL 85 mg/kg
Lead	18	18	860	0 above HIL D 1500 mg/kg	0 above generic ACL 1800 mg/kg
Mercury	18	10	1.7	0 above HIL D 730 mg/kg	-
Nickel	18	15	38	0 above HIL D 6000 mg/kg	0 above most conservative ACL 55 mg/kg
Zinc	18	17	6,700	0 above HIL D 400,000 mg/kg	9 above most conservative ACL 110 mg/kg
PCB	16	0	<PQL	0 above HIL D 7 mg/kg	-
DDT+DDE+DDD	15	2	9.9	0 above HIL D 3600 mg/kg	0 above EIL 640 mg/kg
Aldrin and dieldrin	15	3	0.18	0 above HIL D 45 mg/kg	-
Other OCPs	15	0	<PQL	0 above HIL D	-
VOCs	5	1	5.5	-	-
Cyanide	10	1	4.7	0 above HIL D 1500 mg/kg	-
PFOS	7	0	<PQL	-	0 above direct and indirect exposure
PFOA	7	0	<PQL	0 above HIL D 50 mg/kg	0 above direct exposure 10 mg/kg
PFOS + PFHxS	7	1	0.034	0 above HIL D 20 mg/kg	-

n number of samples
 - No criteria available/used
 NL Non-limiting
 <PQL Less than the practical quantitation limit

In reviewing the analytical results, the Auditor notes the following:

- AF/FA exceeded the HSL in fill material at TP7A (0.3-0.8 mbgl) and TP10 (0.2-0.4 mbgl). It was also detected below the HSL in fill material at the surface (0-0.2 mbgl) and at depth (2-2.6 mbgl).
- ACM concentrations were less than the HSL during the DSI, however fragments of potential ACM were observed in fill material in half of the test pits undertaken during assessment for the WC and VENM report. Four fragments were tested by the laboratory and confirmed to contain asbestos.
- Concentrations of PAHs were not identified above the commercial/industrial land use criteria adopted by the Auditor, however, a concentration of benzo(a)pyrene TEQ was identified by Alliance exceeding the recreational land use HIL (HIL C) in fill material from TP10A at 0.4-0.5 mbgl. It was noted that this sample contained boiler ash and results of other samples of fill

material containing boiler ash did not contain elevated concentrations of benzo(a)pyrene TEQ (four of thirteen locations).

- Elevated concentrations of metals were not identified above the commercial/industrial land use criteria adopted by the Auditor, however, concentrations of lead exceeded the recreational human health criteria (HIL C) adopted by Alliance in two samples of surficial fill material (TP9 and TP103).
- Elevated concentrations of copper and zinc exceeding the most conservative ACL ecological criteria were identified in fill material.
- Elevated concentrations of 1,2-dichlorobenzene, 1,4-dichlorobenzene and chlorobenzene were detected in the sample collected from TP11A at 0.4-0.5 mbgl. A moderate to strong hydrocarbon odours was also noted at this location. VOCs were not detected in other samples.
- OCPs, cyanide and PFAS were detected in a limited number of samples at concentrations less than the human health and ecological criteria. Concentrations of phenols and PCBs were less than the PQL.

8.3 Auditor's Opinion

In the Auditor's opinion, the soil analytical results are consistent with the site history and field observations. The results indicate that fill material is impacted by bonded and friable asbestos. Concentrations of copper and zinc exceeded the conservative ecological criteria.

In the Auditor's opinion, the fill material was adequately characterised for remedial planning purposes and remediation was required to make the site suitable for the proposed use.

9. EVALUATION OF GROUNDWATER RESULTS

Groundwater investigations at the site have not been undertaken. As noted in Section 1.2, the Auditor previously prepared two SARs and SASs for the remediation of off-site portions of 1C Sydney Steel Road completed between 2018 and 2021 for a dive structure (TO-024-3) and culvert realignment works (TO-024-7) within the SMTF. Remediation was undertaken generally by excavation and off-site disposal of all fill material and natural soil/bedrock (where required). SAS TO-024-3 concluded that the auditable area was suitable for use as a dive structure for below ground train network. SAS TO-024-7 concluded that the auditable areas were suitable for use as a Sydney Metro stabling yard and maintenance facility.

In assessing the results reviewed for TO-024-3 and TO-024-7, the Auditor made the following observations with regards to groundwater for areas adjacent to the site:

- The analytical results for groundwater samples collected from wells adjacent to the audit site indicated that concentrations of the majority of the analytes were below the adopted health and ecological screening criteria.
- Elevated concentrations of individual metals (including cadmium, copper, nickel and zinc) were detected above the adopted criterion in some groundwater samples, however, the consultants concluded that the metals were attributed to diffuse urban-sourced background contaminant levels in the Sydney metropolitan area and not from a site-specific source.
- Cadmium was detected in three groundwater samples at a concentration of up to 1.3 mg/L, approximately two times the ecological screening level. Cadmium was not detected at elevated concentrations in fill material and natural soil. The detections of cadmium are therefore likely to be representative of naturally occurring concentrations or diffuse urban pollution.
- Low concentrations of ammonia, methane, TRH F1, chloroform, cis-1,2-dichloroethene (DCE), trichloroethene (TCE), sum of PFHxS and PFOS, and PFOA were detected in the groundwater samples. The TCE concentration exceeded the adopted carcinogenic criteria (4.9 µg/L), however was less than the criteria for ingestion (12 µg/L), dermal contact (74 µg/L) and inhalation (9.6 µg/L) and was located within the dive structure site. The ammonia and other VOC results were less than the screening criteria and were not considered to pose a significant risk to site receptors. The noted source of ammonia and methane was considered to potentially be the former backfill in the brick pits or swamp sediments. The source of TRH and VOC was likely from historical site land use. The concentrations of the sum of PFHxS and PFOS, and PFOA were substantially below the HEPA criteria and were not considered to be of concern.
- The PQL for OCPs and OPPs were above the adopted criteria for most analytes. However, no OCPs and OPPs were detected in any groundwater sample indicating that OCPs and OPPs are unlikely to be of concern in groundwater at the site.
- The benzo(a)pyrene PQL was above the ecological and the human health screening criteria. Benzo(a)pyrene was not detected in any of the samples and no other individual PAH contaminant was detected above the PQL in any of the groundwater samples that were analysed. Therefore, benzo(a)pyrene was not considered to be a contaminant of concern in groundwater.

The Auditor concluded that *"The metals concentrations detected are not considered to present a risk to human health and are likely to represent regional groundwater conditions. Further, the observed exceedance of the USEPA (2019) RSL carcinogenic criterion for tap water for TCE at location MVMW09 is marginal, with the observed concentration of TCE in groundwater at that location below the RSL criteria for ingestion, dermal contact and inhalation. Based on the data*

reviewed I am of the opinion that the risk posed by TCE in groundwater beneath the site is low and acceptable."

9.1 Auditor's Opinion

In the Auditor's opinion, the groundwater results reviewed for TO-024-3 and TO-024-7 are acceptable when considering groundwater conditions at the site. Although a UST was identified during early earthworks at the site, this potential point source of contamination was subsequently removed and elevated soil validation results were not identified (discussed in Section 10.1). On this basis, the Auditor considers that there is a low potential for significant groundwater contamination to be present below site.

10. EVALUATION OF REMEDIATION

10.1 Previous Remediation Works (UST Removal)

Development works initially required excavation and offsite disposal of surplus soils to achieve design levels. During early earthworks, SCLW identified a UST in the north-eastern portion of the site.

As noted in section 1.3, the UPSS Validation Report was completed by Alliance. A walkover of the UST location was undertaken by Alliance on 26 August 2022. During the walkover, Alliance made observations of the location and the layout of the UST:

- Alliance estimated the UST dimensions to be approximately 10 m long and 2 m in diameter with the tank filling point located in the centre of the UST.
- There was no visual or olfactory evidence of hydrocarbon staining or odour on the surface of the material in the immediate vicinity of the UST.
- Pipework associated with the UST, appeared to have been contained within the footprint of the UST
- Liquid was observed in the UST.

The UPSS Validation Report notes that Alliance were not present during the removal of the UST, however, photographs were provided to Alliance by the demolition contractor and it was reported that the UST was in good condition with no obvious holes, splitting or rust. The resultant pit was estimated to be approximately 11.5 m in length, 6 m wide and 3 m deep.

Alliance attended the site on 12 September 2022 and obtained 14 soil validation samples from the UST excavation pit (VS-A to VS-N), as shown in Attachment 4, Appendix A. Alliance did not identify which samples were obtained from walls or from the excavation base, however, excavation base samples were obtained at one per 25 m² while wall samples were collected at a frequency of one sample per 10 linear metres (and at least one sample per 5 m length of tank) and one sample per 2 m depth interval or as required to target each observed depth/area of concern (minimum of 1 sample per wall). PID readings of each sample ranged from 6.9 to 13.2 ppm. Visual evidence of staining or odours was not observed/detected by Alliance.

All samples were analysed for lead, PAHs, TRH, BTEX and VOCs. Alliance reported the following exceedances:

- Two concentrations of lead (840 mg/kg and 720 mg/kg) in samples VS-C-0.5m and VS-E-0.3m respectively, above adopted screening criterion of 600 mg/kg
- A concentration of benzo(a)pyrene TEQ (60 mg/kg) in sample VS-F-1.8m, above the adopted screening criterion is 40 mg/kg
- Detected concentration of TRH >C₁₆-C₃₄ in sample VS-C (0.5 m) of 3,800 mg/kg exceeding the management limit adopted.

A tank pit water sample (UST-GW) was collected from the open UST pit. The surface water was noted by Alliance to be slightly turbid and brown in colour, with no non-aqueous phase liquid (NAPL) observed. Visual evidence of sheen or odours were not observed/detected by Alliance. The sample was analysed for lead, PAHs, TRH, BTEX, phenols and VOCs. Alliance reported *"The detected concentrations of the relevant TRH and BTEXN compounds in the tank pit water sample analysed, was less than LOR and less than the adopted screening criteria. Further assessment of vapour intrusion / inhalation human health exposure risks, in soil and tank pit water, is considered not warranted."*

Alliance reported that waste tracking log records for the tank backfill material (stockpile) were not provided, however, Alliance did prepare a waste classification for the material. Alliance reported that the field observations and laboratory analytical results of the backfill sands were consistent with the field observations and laboratory analytical results of this tank pit validation assessment.

Alliance reported that approximately 1,000 litres of liquid was pumped out and removed from the UST during tank removal works. Waste disposal records indicated that 1,000 litres of G110 flammable liquid were disposed of at Cleanaway's waste facility, located at the corner of Blackman Crescent and Fairey Road, South Windsor, NSW.

Based on observations made during the fieldwork undertaken at the site, Alliance made the following conclusions:

- *“Visual and olfactory evidence of petroleum hydrocarbons was not observed in soil or tank pit water of the tank pit;*
- *Evidence of tank leakage in soil and tank pit validation laboratory analytical results, was not observed;*
- *The potential for unacceptable soil and tank pit water contamination (in the context of human health), as pertains to the UPSS decommissioned and removed, to be present in the UST tank pit, is considered to be low;*
- *Evidence of land contamination was identified within soils (specifically lead and benzo(a)pyrene TEQ) in the tank, likely associated with uncontrolled fill, which may present an unacceptable human health and/or ecological exposure risk to end users of the site.”.*

Based on the conclusions, Alliance recommended that a contamination assessment of soils adjacent to the tank pit should be undertaken to address the identified potentially unacceptable human health and/or ecological risks.

10.1.1 Auditors Opinion

The UPSS Validation Report documented the removal of a potential contamination source at the site. The Auditor agrees with the conclusions made by Alliance that contaminants identified in the validation samples are likely associated with uncontrolled fill material, rather than the UST. Additional assessment of the site from the identified contamination was undertaken in the DSI (discussed in Section 8).

The Auditor notes that an assessment of validation results against ecological criteria was not undertaken by Alliance. When assessing the validation results against the criteria outlined in Section 7, the Auditor noted concentrations of benzo(a)pyrene in sample VS-F and TRH >C₁₆-C₃₄ in five samples (VS-C, VS-D, VS-E, VS-F, VS-J and VS-M) exceeding ecological criteria. Based on the land use of the site (i.e. capped road), the elevated ecological contaminant concentrations remaining in soil do not pose a risk.

10.2 Pre-Remediation Conceptual Site Model and Remediation Required

Based on the results of the DSI, Alliance determined that uncontrolled filling (nominally 1.2 m thick) and uncontrolled demolition had resulted in fill impacted by asbestos (bonded and/or friable) and carcinogenic PAHs across the entire site. Hydrocarbon odours were considered to present an aesthetic issue in the vicinity of former UST along with aesthetic issues associated with two stockpiles (concrete and soil). The Auditor has summarised the issues identified as requiring remediation and the preferred options considered in the RAP in Table 10.1.

Table 10.1: Remediation Required and Preferred Options

Description	Extent of Remediation Required	Preferred Options
Benzo(a)pyrene TEQ, and friable and bonded asbestos	Lateral: Entire site Vertical: nominal average depth of 1.5 mbgl.	Cap and contain in situ
Hydrocarbon odorous soils in the vicinity of former UST	Lateral: UST excavation (approximate 100 m ²) Vertical: nominal average depth of 0.5 mbgl	Cap and contain in situ
Concrete and Soil Stockpile	Concrete Stockpile: Approximately 60 m ³ Soil Stockpile: Approximately 100 m ³	Excavation and off-site disposal

10.3 Evaluation of RAP

It is understood that remediation and validation works had commenced prior to the Auditor's engagement. The Auditor assessed the RAP by comparison with the checklist included in NSW EPA (2020) *Consultants Reporting on Contaminated Land*. The RAP identified that remediation of the contaminated fill was required and the preferred option proposed included a combination of excavation and off-site disposal of impacted soil along with encapsulation of impacted soil under capping associated with the proposed development. Any encapsulation was to be managed via an EMP. The RAP was found to address the required information.

10.4 Remedial Works Undertaken and Validation Activities

Remediation was undertaken by SCLW with environmental consulting provided by Alliance between November 2022 and May 2023. Alliance reported in the Validation Report that soils were excavated to achieve proposed design levels with surplus materials disposed offsite prior to the DSI, remediation and validation works. It is understood that the costs for continued disposal/removal of material was financially unsustainable for the project and it was decided to pursue a different remedial strategy for the management of the impacted material.

Remediation of fill at the site relied on the placement of a capping layer of specified form and thickness across the site to separate site users from residual soil contamination. The capping layer generally comprised the placement of a geotextile fabric material (to act as a separation and marker layer) prior to placement of capping materials (including imported materials).

In order to allow for the installation of the physical separation capping layers, remedial works included some limited earthworks for underground services. In addition, the soil stockpile and concrete stockpile identified in the RAP also required offsite disposal. The following subsections outline the remediation and validation activities undertaken including waste disposal and imported materials.

10.4.1 Remediation and Validation of Stockpile Removal

The Validation Report documents that Alliance observed the excavation and loading of the stockpiled material (concrete and soil) into client supplied trucks for offsite disposal on 1 and 2 December 2022. Alliance reported that the concrete stockpile was transported to another location on the broader client site and was disposed offsite in February 2023.

Alliance undertook a visual assessment of stockpile footprints following removal, with the results indicating that the stockpiles had been adequately removed. In addition, the Validation Report notes that the location of the stockpile footprints was then covered over by the marker layer and capping works discussed below.

10.4.2 Installation and Validation of Marker Layer

Alliance reported in the Validation Report that "A white geotextile marker layer was then installed in sections across the impacted fill soils.". Following the installation of each section, an inspection

of each section of the geotextile marker layer was undertaken by Alliance. The geotextile fabric was observed to have been pinned together and each roll of material had an overlap of approximately 0.3 m to 0.4 m. The geotextile marker layer placed along the northern and southern boundary was extended 0.5 m beyond the boundary, however some sections of the geotextile marker layer across the southern boundary could only be extended about 0.1 m to 0.2 m beyond the boundary due to the presence of a fence. Photographs of the marker layer installation were included in the Validation Report.

Alliance reported that where services, footings or drainage pits were required these areas were excavated to the required depths, with material excavated spread and levelled across areas of the site prior to the walls and base of these excavations being lined with the geotextile marker layer.

10.4.3 Validation of Installed Capping

Following the installation of each section of geo-textile marker layer, imported materials were placed across the site as capping in two distinct capping types including "the road portion" and "the landscaped portion".

The Validation Report documented the findings of a capping layer survey (Attachment 5, Appendix A) which recorded the elevation of the marker layer, the elevation of finished levels and the nature and thickness of the capping in the two capping type site areas.

Based on the information presented in the survey plan, Alliance noted that the thickness of capping placed above the marker layer in the road portion of the site ranged from approximately 0.61 to 0.94 m while the thickness of capping placed above the marker layer in the landscaped areas of the site ranged from approximately 0.55 to 0.96 m.

Alliance reported that the capping thickness at two locations within the road portion of the site near the western boundary marginally did not meet the planned thickness (0.683 m) specified in the RAP. Alliance considered that *".....although the planned thickness of the capping layer was not achieved, the actual thickness and material type (engineered subgrade and hardstand pavement) is sufficiently adequate to break the exposure pathway between identified sources and receptors on site, based on the proposed land use scenario, subject to ongoing management of that capping layer."*

10.4.4 Material Disposed Off-Site

Alliance prepared four waste classification letters which were included as appendices to the Validation Report. Waste materials generated on-site were sampled and classified in accordance with the EPA (2014) *Waste Classification Guidelines*. Sampling from stockpiles of excavated soils and in-situ material was undertaken to characterise and classify the waste materials prior to off-site disposal. Approximately 3,354.53 tonnes (t) of waste material was disposed off-site, including the following waste types:

- General Solid Waste (non-putrescible) (GSW) - Special Waste (Asbestos) for all in situ fill material and soil stockpile.
- Restricted Solid Waste (non-putrescible) (RSW) for soil stockpile generated from the UST removal.

Waste materials were disposed from the site between June 2022 and February 2023. Alliance included supporting documentation from the contractors including waste disposal docketts and a tracking register.

The Auditor has reviewed the documentation provided and is of the opinion that the supplied documentation is consistent with the remedial works described. Further assessment of the waste classifications and disposal quantities is provided in Section 14.6.

10.4.5 Imported Material

The Validation Report documented that approximately 1,360 m³ and 359.96 tonnes (t) of materials were imported to the site for use as capping. In addition, the client provided a letter documenting the importation of approximately 151 m³ of recycled mulch which was placed in the landscaped portions of the site. Table 10.2 below provides a summary of the materials imported to the site, including quantities, site use and supporting documentation reviewed by the Auditor in assessing the suitability of imported material for use at the site.

Table 10.2: Imported Fill

Material type/Source	Quantity imported	Site Use	Supporting Documentation and Alliance Conclusion	Auditor Comments
Rozelle Interchange Tunnel Spoil	1,360 m ³	Road subgrade	<p>Imported material was generated during tunnel infrastructure construction at Rozelle Interchange and imported to site under the Rozelle Interchange tunnel spoil exemption and order 2019, between June 2021 and December 2021. Supporting documentation concluded that the subject material generally met the criteria for the Resource Recovery Order.</p> <p>The material was further assessed by Alliance prior to importation. Alliance obtained 20 samples from two stockpiles with samples analysed for metals, TRH, BTEX, PAHs, OCP, PCB and asbestos (% w/w). A gravimetric assessment for asbestos was also undertaken for each sample.</p> <p>Alliance reported that the materials observed during sampling were consistent with that of materials described in in the supporting documentation.</p> <p>Based on review of supplied documents and analytical results, Alliance considered that <i>"the material is suitable to be imported and used on the site."</i></p>	Based on the source of the materials, along with the observations and analytical results reported by Alliance, the imported material is considered suitable for use at the site from a contamination perspective.
Topsoil (Benedict Sand and Gravel)	210.98 t	Landscaped portions	<p>A copy of the product docket and product specifications was presented in Appendix I of the Validation Report.</p> <p>Alliance visually assessed the material before it was spread, and obtained four samples for analysis. Samples were analysed for metals, OCPs and asbestos (presence/absence).</p> <p>Based on the supporting documentation, fieldwork observations and laboratory analytical data, Alliance considered that <i>"the imported</i></p>	<p>The Auditor notes that the product dockets appended to the Validation Report indicated that the material is likely a recycled product.</p> <p>Based on the supporting documentation, the visual observations and laboratory analytical data obtained by Alliance, the imported material is considered suitable for use at the site from a contamination perspective.</p>

Material type/Source	Quantity imported	Site Use	Supporting Documentation and Alliance Conclusion	Auditor Comments
<p>DGB20 Aggregate (Benedict Sand and Gravel)</p>	<p>148.98 t</p>	<p>Road portion</p>	<p><i>material was appropriate for use on the site.</i></p> <p>A copy of the product docket and product specifications was presented in Appendix I of the Validation Report.</p> <p>Alliance reported that they were not present during importation and placement, however, a visual inspection was undertaken following placement. The placed imported material was observed to be consistent with the description of the product docket and specification.</p> <p>Based on a review of the supplied documentation and visual assessment following placement of the material, Alliance considered <i>"the material to be consistent with the criteria set out in NSW EPA Recovered Aggregate Order 2014, and therefore suitable to be imported and used on the site (within the limitations of the Order)."</i></p>	<p>The Auditor notes that the product dockets appended to the Validation Report indicate that the material is likely a recycled product and therefore validation sampling may have been required in accordance with the RAP. Given the material is placed below the road pavement, the lack of validation data is not considered to impact the suitability of the site for the proposed use. The Auditor notes that material produced under <i>NSW EPA Recovered Aggregate Order 2014</i> requires routine batch testing and management procedures. Based on the supporting documentation, required batch testing and the visual observations by Alliance, the imported material is considered suitable for use at the site from a contamination perspective.</p>
<p>4- 25 mm Recycled Mulch (Bingo Industries)</p>	<p>151 m³</p>	<p>Landscaped portions</p>	<p>The client provided a letter addressed to the Auditor outlining the mulch source, volume imported, dates imported and included tax invoices and two supporting laboratory certificates from the supplier.</p> <p>Mulch was imported to the site on 1 March 2023 and the two supporting laboratory certificates (Envirolab) were for analysis of samples obtained in December 2022 and February 2023. Each laboratory report was for four samples analysed for metals, OCPs, foreign materials and asbestos (% w/w). Generally, all chemical results were below the PQL or marginally above the PQL. Asbestos and foreign materials were reported to be <PQL.</p> <p>The MIAA was undertaken by ADE approximately 12 months following placement of mulch at the site. The MIAA included an initial walkover inspection followed by test pits placed on a generally evenly spaced grid. 10 L samples were evenly spread across a contrasting surface to assess</p>	<p>The batch testing results provided by the supplier indicate that the material is free from foreign materials and asbestos.</p> <p>Minor engineered wood products and anthropogenic wastes (plastic including PVC pipe) were observed in the placed mulch by Alliance and the Auditor during a site visit in August 2023. The aesthetic impact of these materials is not considered significant. The material does not meet the requirements of Section 5.1.1 of the EPA Mulch Order 2016 and the Auditor has notified the EPA (Appendix C). The 'Notes' within the Mulch Order 2016 state that <i>"the EPA recognises that the mulch may contain extremely low and incidental amounts of engineered wood products and/or physical contaminants"</i>. The quantity of anthropogenic material observed in the mulch appeared to be consistent with the Notes in the Mulch Order.</p>

Material type/Source	Quantity imported	Site Use	Supporting Documentation and Alliance Conclusion	Auditor Comments
			<p>for the presence of potential ACM and anthropogenic waste.</p> <p>As noted in Table 6.1, 13 test pits were located within the site or within closed proximity (TP47 to TP59) as shown on Attachment 9, Appendix A.</p> <p>From surface observations and screening of 10 L samples, the material was described as brown mulch generally between 1-5 cm in size. No fragments of potential ACM or suspect asbestos in other forms were visually identified during the site inspection. Minor concentrations of foreign materials were observed, including painted MDF, fragments of glass, brick and concrete, shredded PVC plastic.</p> <p>ADE concluded that <i>"...the assessed mulch material present at the site is suitable for its prescribed land use as commercial industrial land. The material assessed within nominated investigated areas can be retained on site."</i></p>	<p>Based on the observations, supporting documentation and the MIAA, the imported mulch material is considered suitable for use at the site from a contamination perspective.</p>

10.5 Auditor’s Opinion

In the Auditor’s opinion, the identified contamination at the site has been effectively remediated via containment below capping layers. Validation was undertaken in accordance with the RAP and was adequate to demonstrate successful remediation.

Material disposal during the course of remedial works was undertaken in accordance with the relevant guidelines and regulations.

Imported materials used to cap the site are considered acceptable for use at the site. The mulch imported and placed in landscaped areas of the site contained minor inclusions of engineered wood products and anthropogenic wastes, however, the minor quantity was considered to be consistent with the ‘Notes’ of the Mulch Order 2016 which allows *"extremely low and incidental amounts"*.

Ongoing management of residual contamination capped on the site is required, as discussed in Section 13, to ensure that the risks associated with contaminated soils retained on site remain low and acceptable during the day-to-day use of the site.

11. CONTAMINATION MIGRATION POTENTIAL

Fill materials containing elevated concentrations of PAHs, lead and asbestos were identified at the site. Remediation of the site was undertaken comprising a combination of capping/containment of identified contamination and/or the excavation and offsite disposal of surplus soils to enable capping. An EMP has been prepared to manage capping/marker layers. The capping layer and low permeability of underlying clay soils will limit the potential for offsite migration of contaminants in dust or surface water and the potential leaching of contaminants from fill material to groundwater. It is further noted that asbestos is not a leachable contaminant.

In the Auditor's opinion, there is no evidence of significant migration of contamination under current conditions. Based on the site being largely capped with asphalt, migration of contamination from the site is unlikely, subject to appropriate management controls required by the EMP (Section 13).

12. ASSESSMENT OF RISK

12.1 Auditors Opinion

Remediation has been undertaken to address the contamination identified during investigations. Based on the remediation performed, the Auditor considers that contaminant concentrations remaining in soil do not pose a risk to site users or the environment under the proposed land use scenario. There is a potential risk to human receptors from dermal contact and inhalation of dust or asbestos fibres associated with contaminants in fill, if disturbed, however the risk is minimised by implementation and management of the capping layers under the EMP.

Groundwater conditions at the site have not been assessed, however groundwater contamination was not identified at the larger SMTF during previous audits and beneficial re-use of groundwater is not proposed at the site. The risks to the environment and human health are therefore low (i.e. no direct contact with seepage and no groundwater abstraction). Any future use of groundwater would require appropriate regulatory approvals from the NSW Office of Water.

13. ONGOING SITE MANAGEMENT

Alliance propose the ongoing management of remnant contamination at the site through the following document, which is attached to the SAS in Appendix B:

‘Environmental Management Plan, Road Infrastructure Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204’, dated 13 March 2024, prepared by Alliance Geotechnical Pty Ltd.

Table 13.1 presents an assessment of the EMP.

Table 13.1: Assessment of the EMP

Item	Auditor Comments
<p><i>Purpose of the EMP</i></p> <p>The purpose of the EMP was noted by Alliance to be to mitigate unacceptable human health exposure risks to users of the site from the residual land contamination, within the scope of the proposed land use scenario.</p> <p>Alliance reported that the EMP comes into effect immediately upon the site transitioning from a construction phase to an operational phase and will remain in force until such time that the EMP is superseded by a new or updated EMP or the residual contamination is remediated in such a way that ongoing management is no longer required.</p>	<p>The Auditor considers that the EMP is an appropriate standalone document that is specific to the site and the specified purpose is relevant/appropriate for the site and the retained contamination.</p>
<p><i>Objectives of the EMP</i></p> <p>The objective of the EMP was to provide a document to address land contamination risks from capped friable and bonded asbestos and benzo(a)pyrene TEQ impacted fill soil across the site, and material with a hydrocarbon odour in the north-eastern portion of the site.</p> <p>The EMP documents the site management requirements needed to facilitate the ongoing protection of onsite and offsite receptors.</p>	<p>The Auditor considers that the objectives of the EMP are relevant and appropriate.</p>
<p><i>The Nature and Location of Contamination Remaining</i></p> <p>Friable asbestos, bonded asbestos containing material (ACM), and BaP TEQ were observed within the residual fill material across the entire site. Hydrocarbon odour was also detected within residual fill material in the north-eastern portion of the site. The location of these impacted soils is shown on a plan in the EMP and presented in Attachment 6, Appendix A.</p> <p>Remaining contamination has been capped beneath capping layers (discussed below) in two distinct areas (public road area and landscaped area).</p>	<p>The extent of fill material retained beneath the capping layers is adequately outlined within the EMP.</p>
<p><i>Extent of Capping and Specification of the Cap</i></p> <p>The extent of capping was defined to be across the entire site consisting of two differing capping type areas (public road area and landscaped area). The location of these capping types are illustrated in Attachment 7, Appendix A.</p> <p>The following cap specifications were included in the EMP:</p> <p><u>Public Road Area</u></p> <p>Minimum 0.6 m thick capping overlying a white geofabric marker layer and contaminated soils. Capping layers comprised grey/dark grey gravelly sand, DGB20 aggregate, 7 mm emulsion primer seal and AC14 asphalt hardstand.</p> <p><u>Landscaped Areas</u></p> <p>Minimum 0.55 m thick capping overlying a white geofabric marker layer and contaminated soils. Capping layers</p>	<p>The capping details presented in the EMP are adequate.</p>

Item	Auditor Comments
<p>comprised grey/dark grey gravelly sand, topsoil followed by planting of grasses/shrubs and surface mulch/woodchips.</p> <p>Typical cross-sections of the capping specifications were included in the EMP and are shown in Attachment 8, Appendix A.</p>	
<p><i>Management Activities</i></p> <p>Section 7 of the EMP identifies management activities and management procedures for any future works (including installation/maintenance of services and landscaping) with the potential for disturbance of capped contaminated fill.</p> <p>Inspections will be undertaken every 6 months across the surface of the site to document the condition of the cap including the nature and extent of any grass dieback, erosion, potholes or cracking. Additional inspections will be undertaken following periods of heavy/prolonged rainfall or after works on site that disturb the capping layer.</p> <p>The EMP will be incorporated in the Operational Environmental Management Plan (OEMP), which has been prepared to address the SSI 7400 conditions of approval.</p> <p>On the basis that the methods do not require human intervention to ensure the ongoing performance, the management of residual contamination under the EMP was considered by Alliance to be passive in nature.</p> <p>Section 7.10 of the EMP outlined a contingency plan should the management strategy not perform. These contingencies include removal of the capping material, and reinstating with an alternatively designed capping system, and treatment of the impacted soils in a way that reduces the unacceptable land contamination risk to an acceptable level.</p>	<p>The Auditor notes that management activities are not required unless excavation activities are proposed beneath capping layers. The management activities outlined in the EMP are considered appropriate.</p> <p>Evidence has been provided that the EMP will be incorporated into the OEMP for the ongoing operation of the site (Appendix C).</p>
<p><i>EMP Review</i></p> <p>The EMP will be subjected to periodical management review by the responsible people (see below) to ensure its ongoing applicability, suitability and effectiveness.</p> <p>The review will be undertaken every 12 months or if there is a change in site use resulting in an impact to the subject area, from the date of implementation of this EMP.</p> <p>Should the review identify a need to modify this EMP, the MTS GM Safety, Quality, Risk and Environment (see below) will communicate that to the Landowner - Sydney Metro.</p>	<p>The EMP review process is considered appropriate.</p>
<p><i>Responsibilities</i></p> <p>Table 7.4 in the EMP defines the responsible parties and tasks for the landowner, site occupant, employees, contractors and visitors. The responsibilities and tasks included:</p> <p><u>Landowner (Sydney Metro)</u></p> <ul style="list-style-type: none"> • Overall ownership of and responsibility for this EMP. • Provide a copy of this EMP to the site occupant and contractors on site. • Induct into, and train the site occupant (Metro Train Sydney, General Manager Safety, Quality, Risk and Environment) and contractors on the relevant aspects of this EMP. • Ensure the implementing of relevant protocols and procedures in this EMP. • Overall modification and management review of this EMP. • Implement relevant protocols and procedures in this EMP. <p><u>Site Occupant - Metro Train Sydney (MTS) General Manager (GM) Safety, Quality, Risk and Environment.</u></p>	<p>The EMP provides a clear indication of those responsible for environmental management, including who will implement the EMP.</p> <p>Written confirmation has been provided from the site owner accepting responsibility for implementation of the EMP (Appendix C).</p>

Item	Auditor Comments
<ul style="list-style-type: none"> • Provide a copy of the EMP to MTS GM Operations & Customer Experience, and MTS GM Engineering & Maintenance Delivery. • Induct into, and train contractors on, the relevant aspects of the EMP. • Ensure the MTS GM Operations & Customer Experience, and MTS GM Engineering & Maintenance Delivery is implementing the relevant protocols and procedures in this EMP. • Initial management review of the EMP. • Implement relevant protocols and procedures in the EMP. <p><u>MTS General Manager Operations & Customer Experience; and Engineering & Maintenance Delivery</u></p> <ul style="list-style-type: none"> • Provide a copy of this EMP to the Environment and Sustainability Advisor, prior to any works commencing on site. • Ensure the site supervisor is implementing the relevant protocols and procedures in the EMP. <p><u>MTS Environment and Sustainability Advisor</u></p> <ul style="list-style-type: none"> • Induct into and train employees, contractors and visitors on the relevant aspects of the EMP. • Inspection of the surface of the capped area (as required and outlined). <p><u>Employees, Contractors and Visitors</u></p> <ul style="list-style-type: none"> • Implement relevant protocols and procedures in the EMP. 	
<p><i>How will the EMP be made legally enforceable?</i> This EMP is considered to be enforceable based on:</p> <ul style="list-style-type: none"> • Appropriate public notification of restrictions applying to the land, to ensure potential purchasers or other interested individuals are aware of the restrictions, has been made. Those notifications have included an appropriate notation on the planning certificate issued under s. 10.7 of the Environmental Planning and Assessment Act; and • A covenant registered on the title to the land under s. 88B of the Conveyancing Act. 	<p>The Auditor considers the EMP is legally enforceable under the conditions of development consent and as a covenant registered on the title to the land under s. 88B of the Conveyancing Act. The EMP can be made legally enforceable in the event of future development via a condition of any future development consent.</p> <p>Written confirmation has been provided from the site owner outlining the intent to register the EMP on the title to the land under s. 88B of the Conveyancing Act (Appendix C).</p>
<p><i>Public notification mechanisms to ensure potential purchasers or other interested parties are aware of contamination and EMP</i></p> <p>There has been appropriate public notification of any restrictions applying to the land to ensure that potential purchasers or other interested individuals are aware of the restrictions, including appropriate notations on the planning certificate issued under s.10.7 (2) of the Environmental Planning and Assessment Act and a covenant registered on the title to land under s.88B of the Conveyancing Act 1919.</p>	<p>The Auditor considers the public notification mechanism to be adequate. A copy of the SAS and EMP will be submitted to Council so that it can be recorded on the Planning Certificate issued under Section 10.7 of the <i>Environmental Planning & Assessment Act 1979</i>.</p> <p>Written confirmation has been provided from the site owner outlining the intent to register the EMP on the title to the land under s. 88B of the Conveyancing Act (Appendix C).</p>
<p><i>Are the Council in agreement with the EMP?</i> Not discussed</p>	<p>A copy of the SAS and EMP will be given to Council to be recorded on the Section 10.7 Planning Certificate.</p>

The appropriate conditions for the implementation of a Environmental Management Plan stated under Section 3.4.6 of NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Ed.)* have been met, namely:

- The EMP has been reviewed by the Auditor.

- The EMP can reasonably be made to be legally enforceable (i.e. Development Consent conditions) in site redevelopment.
- There will be appropriate public notification of restrictions applying to the site through a notification on the Section 10.7 Certificate for the site.
- The remnant contamination is not considered to pose an unacceptable risk to onsite or offsite environments.

13.1 Auditor's Opinion

Based on the above, the Auditor considers that the EMP will provide an adequate framework for the management of the remnant contamination at the site.

14. COMPLIANCE WITH REGULATORY GUIDELINES AND DIRECTIONS

14.1 General

The Auditor has used guidelines currently made and approved by the EPA under section 105 of the NSW *Contaminated Land Management Act 1997*.

The investigation and remediation of the site was generally conducted in accordance with SEPP 55 Planning Guidelines and reported in accordance with the NSW EPA (2020) *Consultants Reporting on Contaminated Land*.

14.2 Resilience and Hazards State Environment Planning Policy (2021)

The investigations were generally conducted in accordance with Chapter 4 Remediation of Land in SEPP R&H (formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) *Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land*. Documents that may be required by SEPP R&H and the status of these are summarised in Table 14.1.

Table 14.1: Reports Anticipated by SEPP R&H

Item	Auditor’s Opinion
Assessment of site contamination which may include a <ul style="list-style-type: none"> - Preliminary Site Investigation 	Addressed by the PSI which identifies past or present potentially contaminating activities and provides a preliminary assessment of the extent and nature of site contamination and includes a detailed appraisal of the site history.
<ul style="list-style-type: none"> - Detailed Site Investigation 	Addressed by the DSI. This investigation was undertaken to define the nature, extent and degree of contamination; assess the potential risk posed by contaminants to human health and the environment by considering the likelihood of exposure to contaminants of concern and the potential effect of such exposure; and obtain sufficient information for the development of a remediation plan (if necessary).
Remediation Action Plan	Addressed by the RAP which included detailed capping thickness specifications.
Validation Report	Addressed by two validation reports (UPSS Validation Report and the Validation Report) documenting the successful remediation and validation at the site.
Environmental Management Plan	Addressed by the EMP which provides a framework for the management of impacted fill remaining at the site.

14.3 Notification

Alliance indicated that the remediation works were classified ‘Category 2’ Remediation Works not requiring consent.

14.4 Development Approvals

SSI 15_7400 was approved by the NSW Minister for Planning on 9 January 2017 for the construction and operation of a metro rail line, approximately 16.5 km long (of which approximately 15.5 km is located in underground rail tunnels) between Chatswood and Sydenham, including the construction of a tunnel under Sydney Harbour, links with the existing rail network, seven metro stations and associated ancillary infrastructure. Condition E67 of the SSI development approval relates to contamination and requires a site audit as follows:

"If a Site Contamination Report prepared under Condition E66 finds such land contains contamination, a site audit is required to determine the suitability of a site for a specified use. If a site audit is required, a Site Audit Statement and Site Audit Report must be prepared by a NSW EPA Accredited Site Auditor. Contaminated land must not be used for

the purpose approved under the terms of this approval until a Site Audit Statement is obtained that declares the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with."

This SAR and accompanying SAS has been completed in order to comply with this condition.

14.5 Duty to Report

Consideration has been given to the requirements of the EPA (2015) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*. Alliance considered in the Validation Report that, based on the site conditions and the implementation of a long term EMP, the site is considered to be suitable for the proposed intended land use. Alliance further noted that "a trigger for the duty to report for the owner and/or occupier of the site, may have been met, subject to an assessment of whether a person:

- *has been, or foreseeably will be, exposed to the benzo(a)pyrene TEQ or a by-product of it; or*
- *has been, or foreseeably will be, exposed to elevated levels of asbestos fibres by breathing them into their lungs.*

The client should take reasonable steps to inform the site owner and/or occupier to seek further advice on that matter, however, it is noted that on the assumption that a site audit statement will be issued certifying that the site is suitable for the proposed land use, no potentially contaminating activities have since been carried out and there are no offsite impacts, then duty to report obligations under the CLM Act, as set out in NSW EPA (2015), may not apply."

Based on the findings presented in this SAR, the Auditor considers that the site is not required to be notified under the Duty to Report requirements.

14.6 Waste Management

In accordance with Section 4.3.7 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor has checked the following aspects relating to waste disposal.

14.6.1 Waste Classification

As noted in Section 11.4.4, four waste classification letters were prepared by Alliance and included within the validation report. It was reported that wastes were classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*. The adopted waste classification strategy included sampling from stockpiles of excavated soils and in-situ material. Material disposed was classified as follows:

- GSW - Special Waste (Asbestos) for all in situ fill material and soil stockpile
- RSW for soil stockpile generated from the UST removal.

Alliance reported that the concrete stockpile was pre-classified as GSW for offsite disposal.

The Auditor considers that the waste classification letters were prepared appropriately and were consistent with the material disposed.

14.6.2 Waste Volumes, Disposal Receipts and Disposal Facilities

89 waste dockets and a material tracking register were appended to the Validation Report documenting the off-site disposal of approximately 3,354.53 t of between material 21 June 2022 and 8 February 2023 including 3,201.07 t of GSW - Special Waste (Asbestos), 75.52 t of RSW and 77.74 t of GSW.

Based on the information provided in the waste dockets and the materials tracking register, the Auditor has summarised the waste disposal information for material disposed offsite to several

waste management facilities that are licensed to receive the specified waste under their Environmental Protection Licence (EPL) in Table 14.2.

Table 14.2: Summary of Waste Disposal

Waste Classification	Tonnage (t)	Disposal Facility	EPL No.
GSW (non-putrescible) and Special waste (Asbestos)	3,201.07	Erskine Park Landfill (Enviroguard Pty Ltd)	4865
General solid waste (building and demolition waste)	77.74	Boral Recycling Wetherill Park	11815
RSW (non-putrescible)	75.52	Cleanaway Kemps Creek	4068

14.6.3 Auditor's Opinion

The Auditor considers that the waste management assessed as part of the remedial works was undertaken in accordance with the relevant guidelines and regulations.

14.7 VENM and Other Imported Materials

Based on the information in Section 11.4.5 and the site visit on 25 August 2023, the Auditor is of the opinion that the materials imported to the site were suitable for use at the site from a contamination perspective.

As documented in Section 11.4.5, mulch was imported to the site which contained minor inclusions of engineered wood and plastic which does not meet the requirements of Section 5.1.1 of the Mulch Order 2016, however, the minor quantity was considered to be consistent with the 'Notes' of the Mulch Order 2016 which allows "*extremely low and incidental amounts*". The mulch was considered unlikely to present a risk to human health or the environment and was therefore considered suitable to remain onsite.

14.8 Licenses

Alliance reported that excavation and removal of asbestos fibre contaminated soils were conducted by Australasian Technical Services NSW Pty Ltd who hold a Class A Asbestos Removal Licence. Copies of the appropriate licences were not appended to the Validation Report. However, the Auditor checked the Service NSW 'Verify a Licence' register (<https://verify.licence.nsw.gov.au/home>) on 27 November 2023 and notes that Australasian Technical Services NSW Pty Ltd are a current licensed asbestos removal contractor (Licence No AD212177).

14.9 Conflict of Interest

The Auditor has considered the potential for a conflict of interest in accordance with the requirements of Section 3.2.3 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme*.

The Auditor considers that there are no conflicts of interest, given that:

1. The Auditor is not related to a person by whom any part of the land is owned or occupied.
2. The Auditor does not have a pecuniary interest in any part of the land or any activity carried out on any part of the land.
3. The Auditor has not reviewed any aspect of work carried out by, or a report written by, the site auditor or a person to whom the site auditor is related.

15. CONCLUSIONS AND RECOMMENDATIONS

Alliance made the following conclusions in the Validation Report: *"The site is considered to be suitable for the following land use scenario:*

- *Public open space such as parks, playgrounds, playing fields, (e.g. ovals), secondary schools and footpaths (but does not include undeveloped public open space such as urban bushland and reserves, which should be subject to site specific assessment where appropriate),*

subject to:

- *the implementation of an environmental management plan (EMP) to address residual asbestos, benzo(a)pyrene TEQ and hydrocarbon odour associated with uncontrolled fill."*

The EMP concludes that *"Alliance considers that the residual friable and bonded asbestos, benzo(a)pyrene TEQ and hydrocarbon odour in soil land contamination identified at the site, would not present an unacceptable human health risk (in the context of the adopted land use scenario), subject to compliance with this environmental management plan."*

Based on the information presented in Alliance reports and observations made on site, and following the Decision-making process for assessing urban redevelopment sites in NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor concludes that the site is suitable for the purposes of 'commercial/industrial' land use subject to compliance with the following environmental management plan:

- 'Environmental Management Plan, Road Infrastructure Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204', dated 13 March 2024, prepared by Alliance Geotechnical Pty Ltd.

Groundwater has not been assessed for any beneficial re-use. Any future use of groundwater would require appropriate assessment and regulatory approvals from the NSW Office of Water.

16. OTHER RELEVANT INFORMATION

This Audit was conducted on the behalf of Systems Connect Line-wide for the purpose of assessing whether the land is suitable for the proposed commercial/industrial uses, i.e. a "Site Audit" as defined in Section 4 (definition of a 'site audit' (b)(iii)) of the CLM Act.

This summary report may not be suitable for other uses. Alliance included limitations in their reports. The Audit must also be subject to those limitations. The Auditor has prepared this document in good faith, but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check.

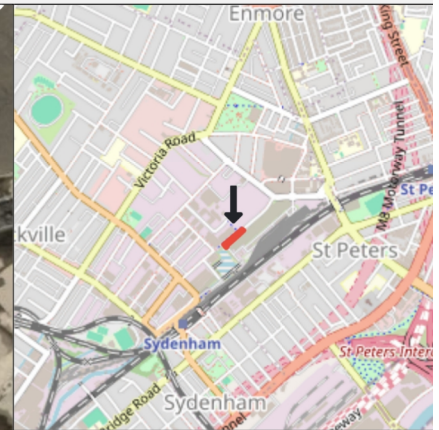
The Auditor has relied on the documents referenced in Section 1 of the Site Audit Report in preparing the Auditor's opinion. If the Auditor is unable to rely on any of those documents, the conclusions of the audit could change.

It is not possible in a Site Audit Report to present all data which could be of interest to all readers of this report. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

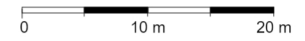
APPENDIX A ATTACHMENTS

- Attachment 1: Site Location
- Attachment 2: Overview of Adjoining Site Features
- Attachment 3: Alliance Sample Locations
- Attachment 4: UPSS Validation Sample Locations
- Attachment 5: Capping Survey Plan
- Attachment 6: Location of Remaining Contamination
- Attachment 7: Inferred Extents of Capping
- Attachment 8: Cross Section of Capping Layers
- Attachment 9: MIAA Sample Locations

Attachment 1: Site Location



Legend
□ Approximate Site Boundary

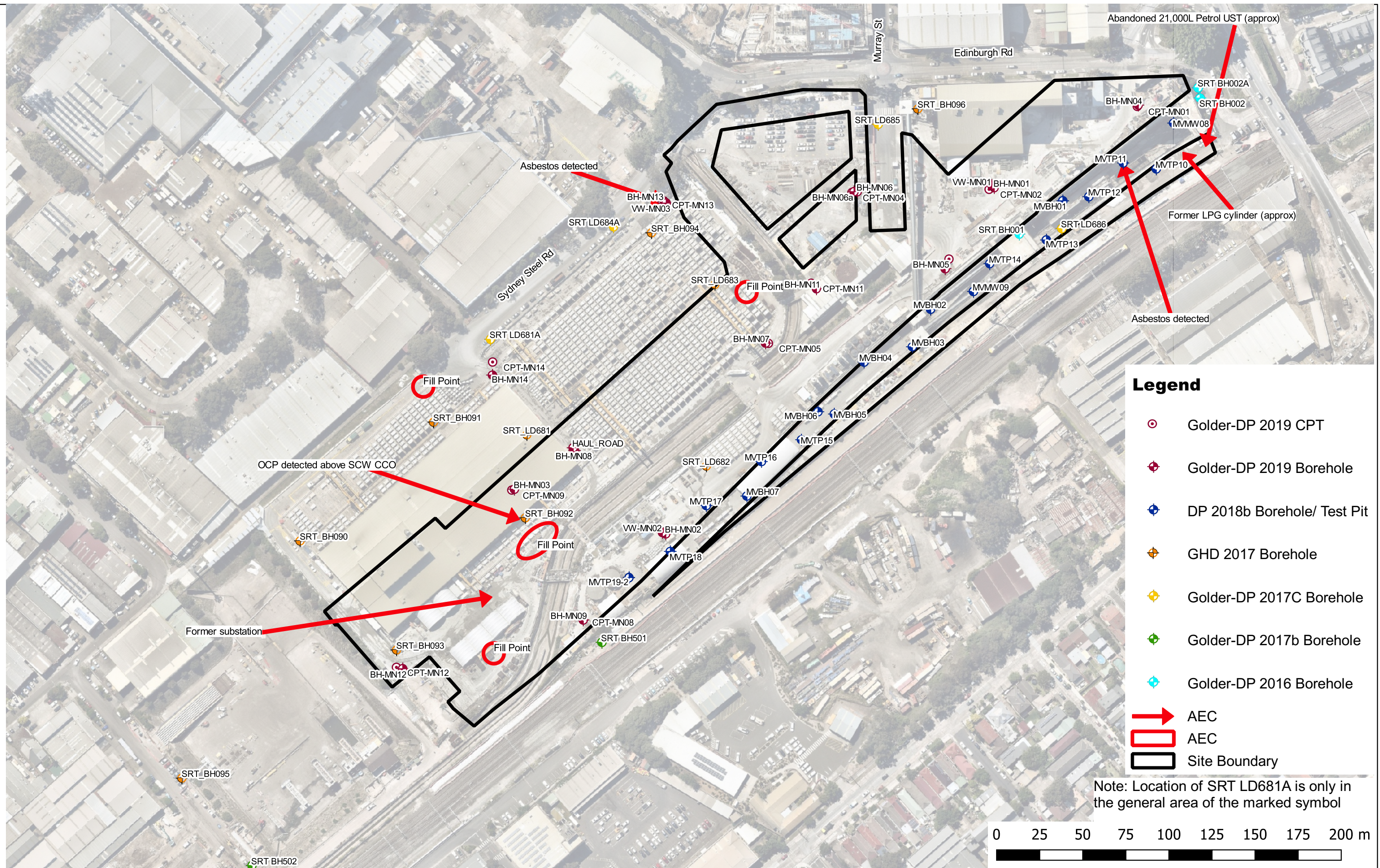


Basemap: © Nearmap

alliance

Copyright of Alliance Geotechnical

Title: Remedial Works Site Boundary	
Client: Systems Connect Line-Wide (CPB Contractors & UGL Engineering)	Drawn: SI Checked: SI
Project: Gate S1 - Sydney Steel Road, Marrickville NSW	Site: SMTF-S Site - Visual Clearance Inspection
Date: 04-06-2024	Figure No: 1
Report Reference: 0	Scale: 1:600



Note: Location of SRT LD681A is only in the general area of the marked symbol





Scale: 20.00 m


Sampling Point Layout Plan

	Client Name:	CPB CONTRACTORS PTY LIMITED & UGL ENGINEERING PTY LIMITED As Systems Connect Line-wide	Figure Number:	3	
	Project Name:	DSI – Proposed Road Construction	Figure Date:	13-10-22	
	Project Location:	1C Sydney Steel Road, Marrickville	Report Number:	9198.27-ER-3-3	



LEGEND

-  Approx. Location of UST Tank Pit
-  Approximate Test Pit Location



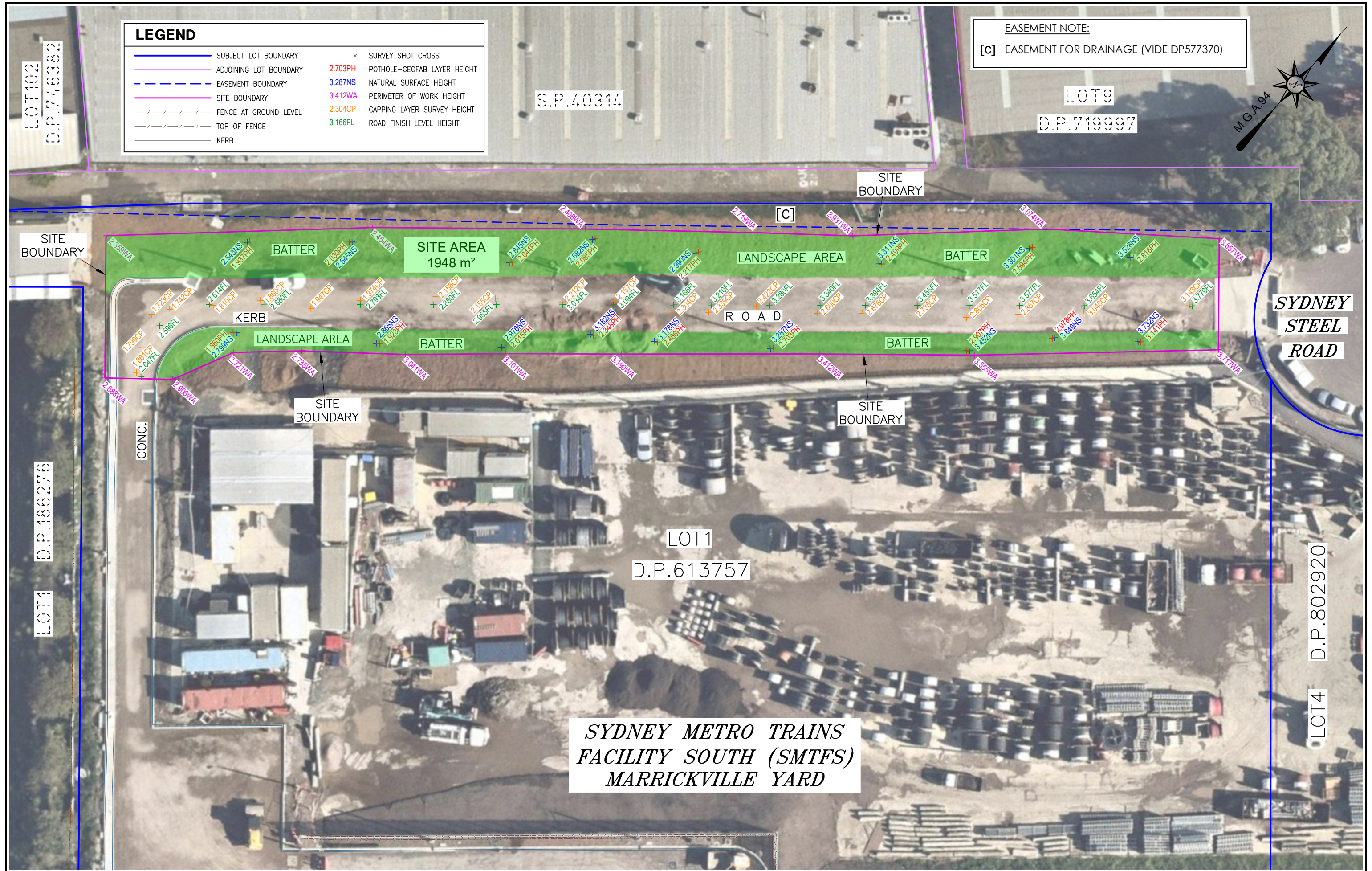
SCALE:  5.0 m

UST Tank Pit Exceedances - Soil (Chemical)

	Client Name:	CPB CONTRACTORS PTY LIMITED & UGL ENGINNERING PTY LIMITED As Systems Connect	Figure Number:	4c	
	Project Name:	DSI - Proposed Road Construction	Figure Date:	24/10/2022	
	Project Location:	1C Sydney Steel Road, Marrickville NSW 2204	Report Number:	9198.27-ER-3-3	

LEGEND			
	SUBJECT LOT BOUNDARY	×	SURVEY SHOT CROSS
	ADJOINING LOT BOUNDARY	2.703PH	POTHOLE-GEOFAB LAYER HEIGHT
	EASEMENT BOUNDARY	3.287NS	NATURAL SURFACE HEIGHT
	SITE BOUNDARY	3.412WA	PERIMETER OF WORK HEIGHT
	FENCE AT GROUND LEVEL	2.304CP	CAPPING LAYER SURVEY HEIGHT
	TOP OF FENCE	3.166FL	ROAD FINISH LEVEL HEIGHT
	KERB		

EASEMENT NOTE:
 [C] EASEMENT FOR DRAINAGE (VIDE DP577370)



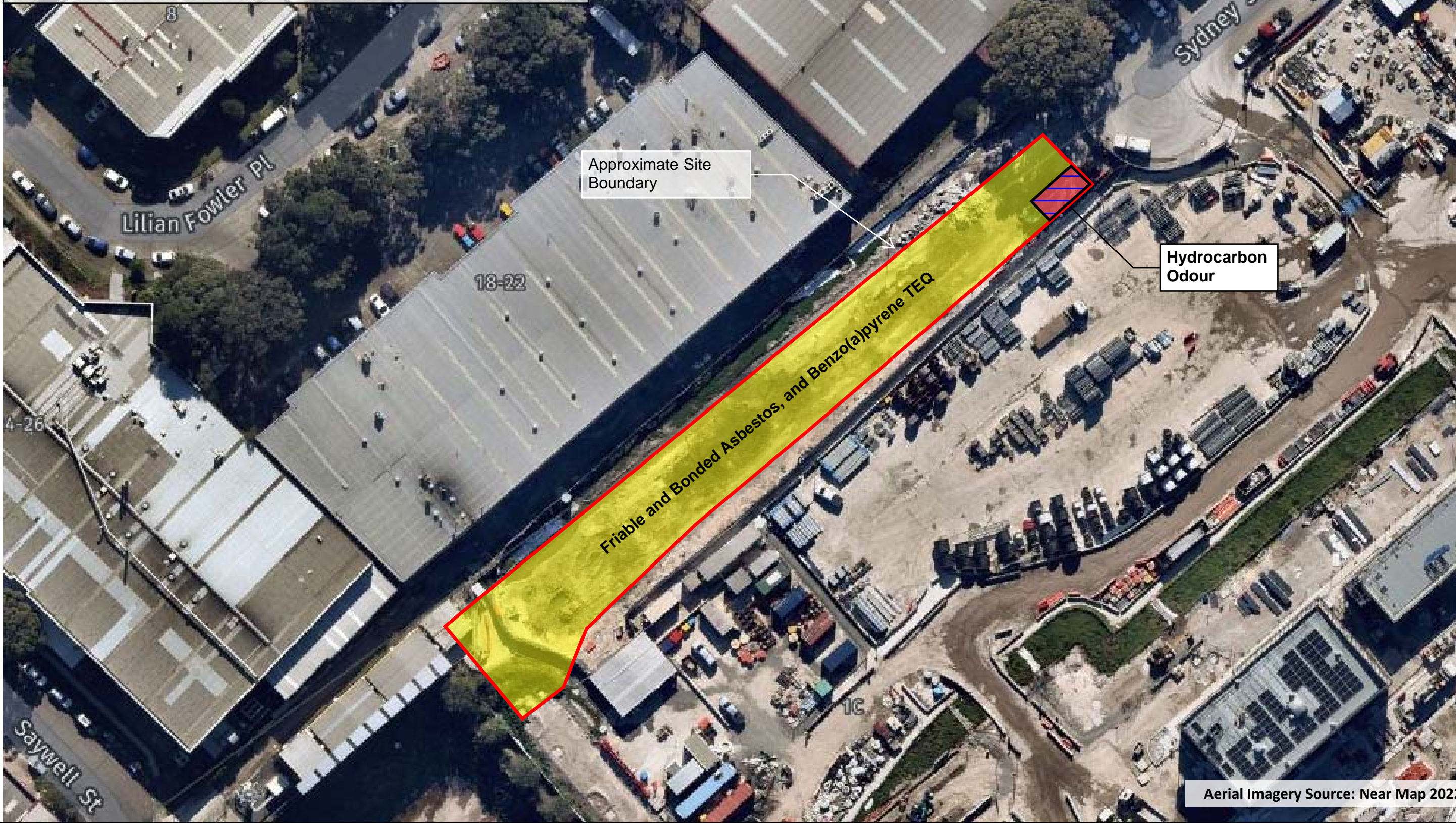
SYDNEY METRO TRAINS FACILITY SOUTH (SMTFS) MARRICKVILLE YARD

	SYSTEMS CONNECT LEVELS 1, 116 MILLER ST, NORTH SYDNEY NSW 2060		HORIZONTAL DATUM: CO-ORDINATE SYSTEM: M.G.A.94 MARKS ADOPTED:	VERTICAL DATUM: DATUM: A.H.D. B.M. ADOPTED: R.L. SOURCE:	PLAN : SHOWING POTHOLING DATA OF ASBESTOS CAPPING AREA FOR, SYDNEY STEEL ROAD , MARRICKVILLE NSW 2204	A3 L.G.A.: INNER WEST	SHEET 1 OF 1		
	B ROAD SURVEY DATA ADDED 27/06/23	A FINAL ISSUE 26/06/23	SURVEYED DSP	MODELLED/DRAWN K.S.	CHECKED J.P.	APPROVED P.G.	SURVEY REFERENCE 35671	SCALE 1:400	DATE 27/06/23
	REV. AMENDMENTS DATE	DRAWING NUMBER 35671-SMTFS-STEEL-RD-PHOLE.DWG	REV. B						

Attachment 6: Location of Remaining Contamination

LEGEND

- Approx. Site Boundary
- Approx. Location of Friable and Bonded Asbestos, and Benzo(a)pyrene TEQ
- Approx. Location of Hydrocarbon Odour



Scale:
←
→
 20.00 m

Area of Environmental Concern Plan



	Client Name: CPB Contractors PTY Limited & UGL Engineering Limited As Systems Connect Line-wide	Figure Number: 2	
	Project Name: Environmental Management Plan – Road Infrastructure	Figure Date: 05 October 2023	
	Project Location: 1C Sydney Steel Road, Marrickville	Report Number: 9198.27-ER-3-6	




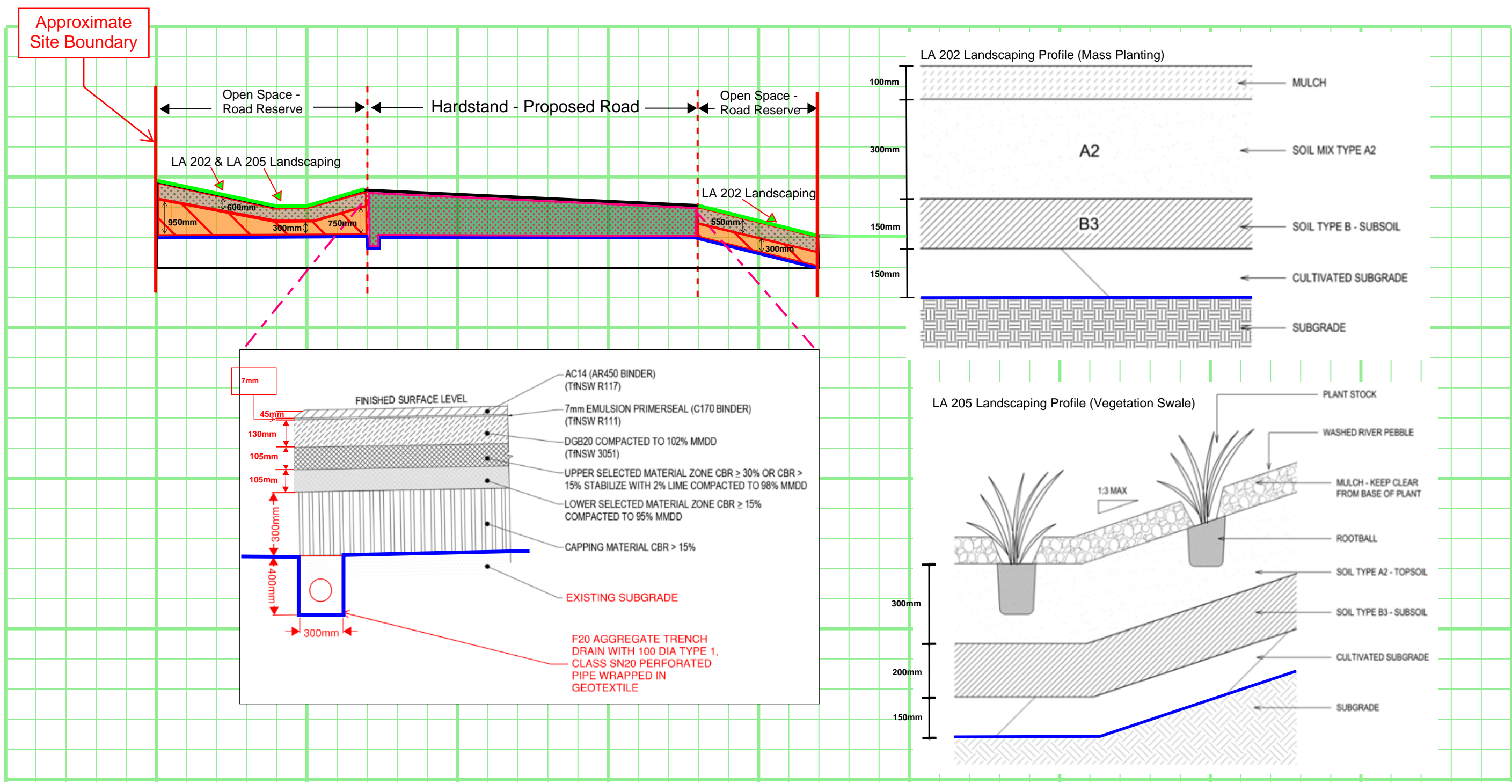
Aerial Imagery Source: Near Map 2022

Scale: ← 20.00 m →

Lateral - Inferred Extent of Capping Layers



	Client Name:	CPB Contractors PTY Limited & UGL Engineering PTY Limited As Systems Connect Line-wide	Figure Number:	4	
	Project Name:	Environmental Management Plan – Road Infrastructure	Figure Date:	05 October 2023	
	Project Location:	1C Sydney Steel Road, Marrickville	Report Number:	9198.27-ER-3-6	

LEGEND
 Marker Layer / Geotextile Fabric

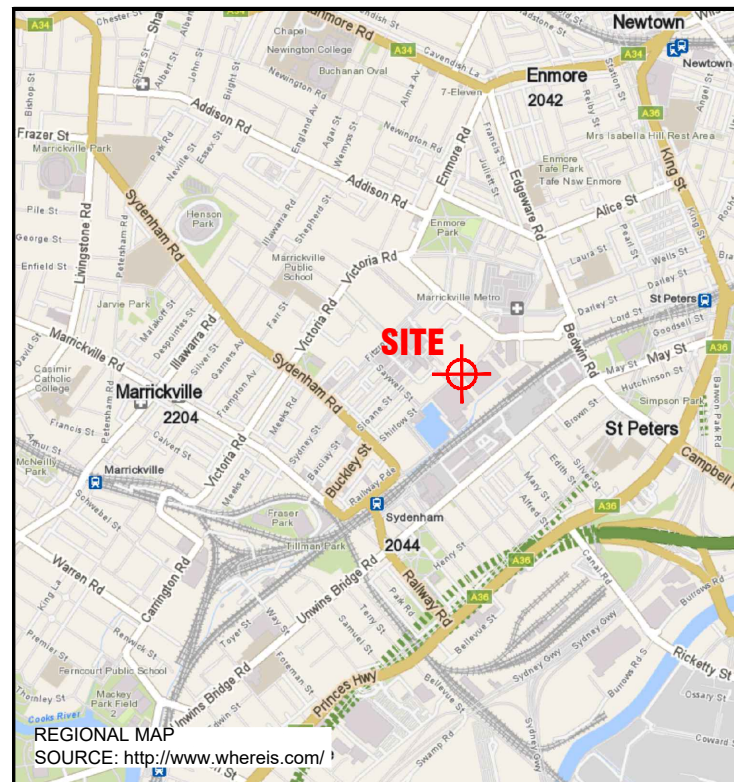


Note: All dimension are in millimetres (mm)

Cross-Sectional View of Capping Layers

	Client Name:	CPB Contractors PTY Limited & UGL Engineering PTY Limited As Systems Connect Line-wide	Figure Number:	5	
	Project Name:	Environmental Management Plan – Road Infrastructure	Figure Date:	05 October 2023	
	Project Location:	1C Sydney Steel Road, Marrickville	Report Number:	9198.27-ER-3-6	

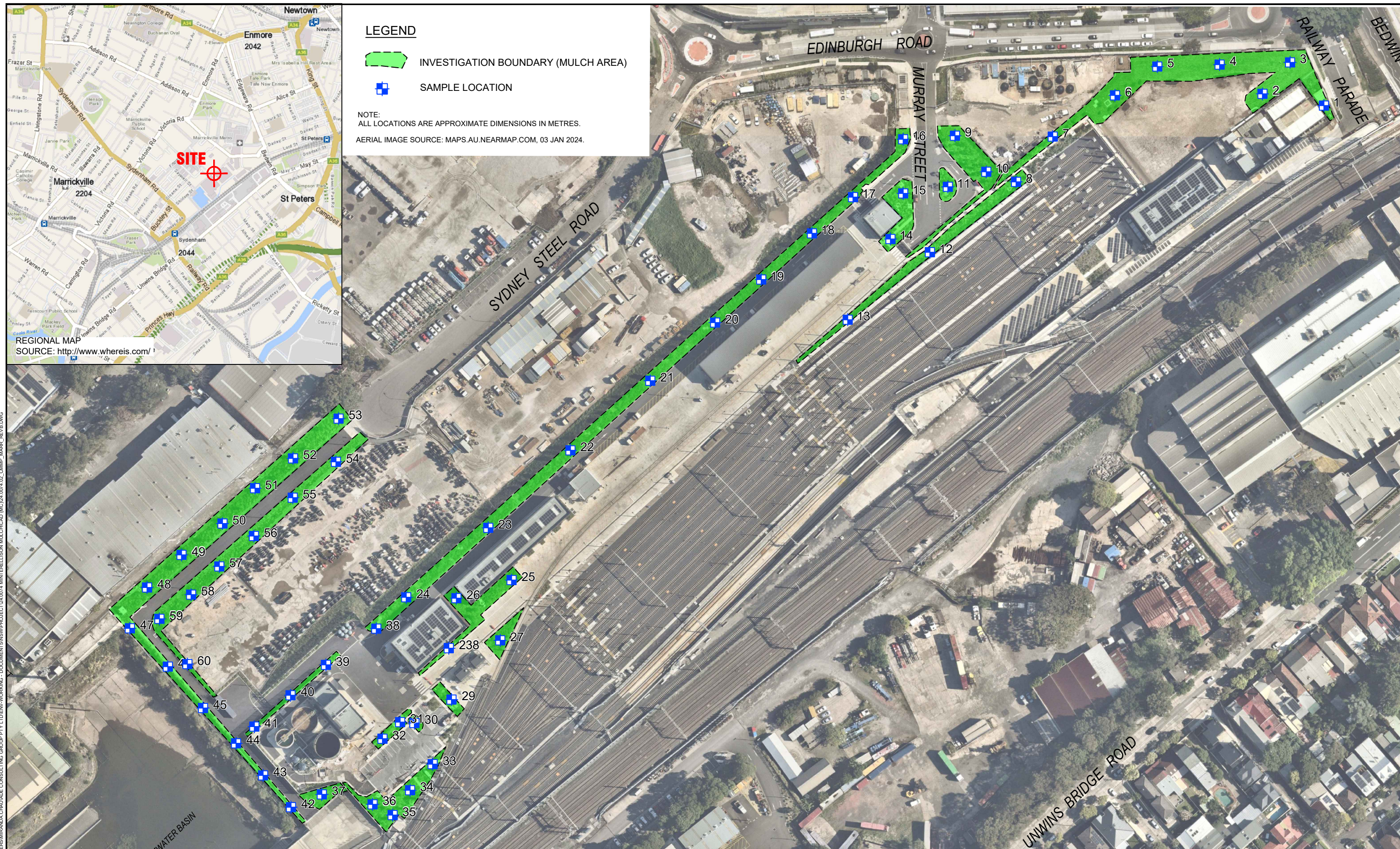
Attachment 9: MIAA Sample Locations



LEGEND

- INVESTIGATION BOUNDARY (MULCH AREA)
- SAMPLE LOCATION

NOTE:
ALL LOCATIONS ARE APPROXIMATE DIMENSIONS IN METRES.
AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 03 JAN 2024.



no.	description	drawn	approved	date
A	FIRST ISSUED	MC	MT	17/04/24
B	SAMPLE INSTALLED	MC	MT	13/05/24

SCALE 1:1600 @A3 METRES

drawn	MC	client:	MINTERELLISON
approved	MT	project:	CONTAMINATED MULCH MANAGEMENT PLAN ASSESSMENT MARRICKVILLE STABLING YARD MURRAY STREET, MARRICKVILLE, NSW
date	13/05/2024	title:	SAMPLE LOCATION PLAN
scale	AS SHOWN	project no:	A101024.0074.02
original size	A3	figure no:	FIGURE 1
		rev:	B

ADE CONSULTING GROUP

Sydney Office
ADE Consulting Group Pty Ltd
Unit 6 / 7 Millennium Court, Silverwater, NSW 2128
www.ADE.group | info@ade.group | 1300 976 922

PLOT DATE: 13/05/2024 4:11:33 PM DWG FILE: C:\USERS\MIRANDA CHAUVADE CONSULTING GROUP\PTV LTD\ENR\WORKING - DOCUMENTS\PROJECTS\0074 MINTERELLISON MULCH\CAD (MC)\24.0074.02_CAMP_MARR_REV.DWG

APPENDIX B
SITE AUDIT STATEMENT



NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. TO-105

This site audit is a:

- statutory audit
- non-statutory audit

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name: Tom Onus

Company: Ramboll Australia Pty Ltd

Address: Level 3, 100 Pacific Highway, North Sydney

Postcode: 2060

Phone: 02 9954 8133

Email: tonus@ramboll.com

Site details

Address: Part 1C Sydney Steel Road, Marrickville

Postcode: 2204

Property description

(Attach a separate list if several properties are included in the site audit.)

Lot 1 DP613757 (See surveyed boundary of site at the end of Part I)

Local government area: Inner West Council

Area of site (include units, e.g. hectares): 1,948 m²

Current zoning: IN1 General Industrial

Regulation and notification

To the best of my knowledge:

the site is the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*, as follows: (provide the no. if applicable)

Declaration no.

Order no.

Proposal no.

Notice no.

the site is not the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*

the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name: Tristan McCormick

Company: Systems Connect Line-wide

Address: Level 1, 116 Miller Street, North Sydney

Postcode: 2060

Phone: 0448 453 366

Email: Tristan.mccormick@sclww.com.au

Contact details for contact person (if different from above)

Name: NA

Phone:

Email:

Nature of statutory requirements (not applicable for non-statutory audits)

- Requirements under the *Contaminated Land Management Act 1997* (e.g. management order; please specify, including date of issue)

- Requirements imposed by an environmental planning instrument (please specify, including date of issue)

- Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

Condition E67 of State Significant Infrastructure (SSI) development application (SSI 15_7400) approved by the NSW Minister for Planning on 9 January 2017

- Requirements under other legislation (please specify, including date of issue)

Purpose of site audit

- A1** To determine land use suitability

Intended uses of the land:

OR

- A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan

Intended uses of the land: Road within a commercial/industrial facility

OR

(Tick all that apply)

- B1** To determine the nature and extent of contamination
- B2** To determine the appropriateness of:
- an investigation plan
 - a remediation plan
 - a management plan
- B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*
- B4** To determine the compliance with an approved:
- voluntary management proposal** or
 - management order** under the *Contaminated Land Management Act 1997*
- B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.

Intended uses of the land:

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Douglas Partners Pty Ltd (Douglas)

Alliance Geotechnical Pty Ltd (Alliance)

ADE Consulting Group Pty Ltd (ADE)

Titles of reports reviewed:

'Report on Preliminary Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Marrickville Dive, Murray Street, Marrickville', 21 March 2018, Douglas.

'Waste Classification Report', 30 May 2022, Alliance.

'Waste Classification Report', 29 June 2022, Alliance.

'Waste Classification and Virgin Excavated Natural Material Report', 3 August 2022, Alliance.

'Waste Classification Report', 15 September 2022, Alliance.

'Underground Petroleum Storage System, Tank Pit Validation, 1C Sydney Steel Road, Marrickville NSW 2204', 11 October 2022, Alliance.

'Sampling & Analysis Quality Plan, Proposed Road Construction, 1C Sydney Steel Road, Marrickville NSW 2204', 21 October 2022, Alliance.

'Detailed Site Investigation Report, Proposed Road Construction, 1C Sydney Steel Road, Marrickville NSW 2204', 16 November 2022, Alliance.

'Remedial Action Plan, Proposed Road Construction, 1C Sydney Steel Road, Marrickville NSW 2204', 25 November 2022, Alliance.

'Site Remediation and Validation Report, Proposed Road Construction, Portion 1C Sydney Steel Road, Marrickville NSW 2204' 22 September 2023, Alliance.

'Environmental Management Plan, Road Infrastructure Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204', 13 March 2024, Alliance.

'Mulch Inspection and Analysis Assessment, Marrickville Stabling Yard, 36 Murray Street, Marrickville, NSW 2204', 23 May 2024, ADE.

Other information reviewed, including previous site audit reports and statements relating to the site:

'Site Audit Report, Marrickville Dive, Murray Street, Marrickville NSW' and SAS TO-024-3 dated 18 September 2020 prepared by Tom Onus of Ramboll Australia Pty Ltd.

'Site Audit Report, Auditable Areas of the Culvert Realignment and Associated Works – Sydney Metro Marrickville Stabling Yard' and SAS TO-024-7 dated 25 May 2021 prepared by Tom Onus of Ramboll Australia Pty Ltd.

Site audit report details

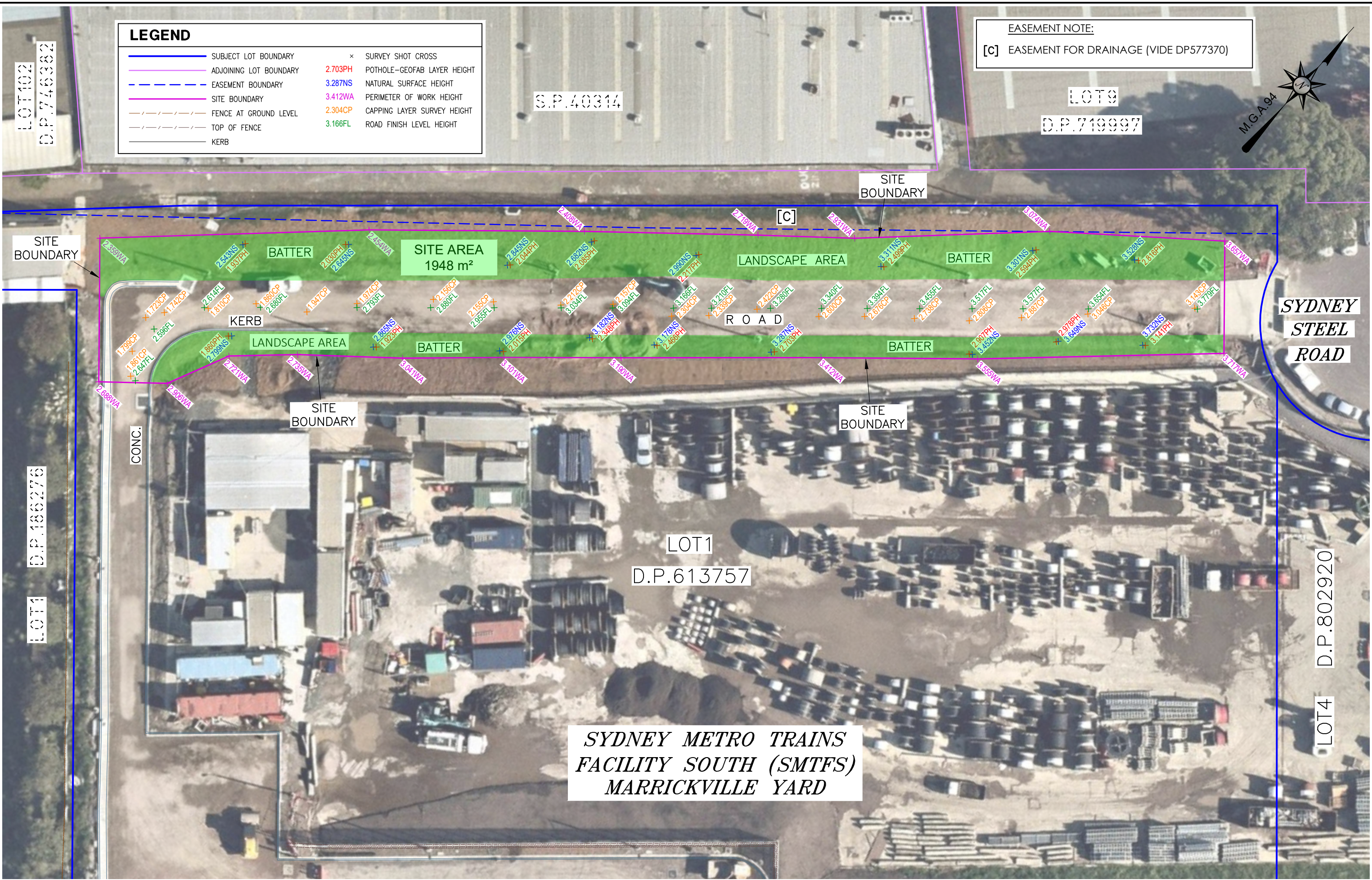
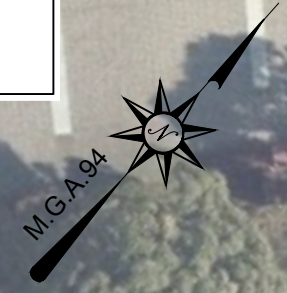
Title: Site Audit Report – Road Infrastructure at 1C Sydney Steel Road, Marrickville

Report no.: TO-105 (Ramboll Ref: 318001281-001) Date: 7 June 2024

LEGEND

	SUBJECT LOT BOUNDARY		SURVEY SHOT CROSS
	ADJOINING LOT BOUNDARY	2.703PH	POTHOLE-GEOFAB LAYER HEIGHT
	EASEMENT BOUNDARY	3.287NS	NATURAL SURFACE HEIGHT
	SITE BOUNDARY	3.412WA	PERIMETER OF WORK HEIGHT
	FENCE AT GROUND LEVEL	2.304CP	CAPPING LAYER SURVEY HEIGHT
	TOP OF FENCE	3.166FL	ROAD FINISH LEVEL HEIGHT
	KERB		

EASEMENT NOTE:
 [C] EASEMENT FOR DRAINAGE (VIDE DP577370)



**SYDNEY METRO TRAINS
 FACILITY SOUTH (SMTFS)
 MARRICKVILLE YARD**

	SYSTEMS CONNECT LEVELS 1, 116 MILLER ST, NORTH SYDNEY NSW 2060		HORIZONTAL DATUM: CO-ORDINATE SYSTEM: M.G.A.94 MARKS ADOPTED:		VERTICAL DATUM: DATUM: A.H.D. B.M. ADOPTED: R.L. SOURCE:		PLAN : SHOWING POTHOLING DATA OF ASBESTOS CAPPING AREA FOR, SYDNEY STEEL ROAD , MARRICKVILLE NSW 2204		A3 L.G.A.: INNER WEST SURVEYED DSP SURVEY REFERENCE 35671 DRAWING NUMBER 35671-SMTFS-STEEL-RD-PHOLE.DWG		SHEET 1 OF 1 CHECKED J.P. SCALE 1:400 DATE 27/06/23 APPROVED P.G. DATE 27/06/23 REV B	
	B	ROAD SURVEY DATA ADDED	27/06/23									
	A	FINAL ISSUE	26/06/23									
	REV.	AMENDMENTS	DATE									

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section. (Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
 - (B1) the nature and extent of contamination, and/or
 - (B2) the appropriateness of an investigation, remediation or management plan¹, and/or
 - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
 - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
 - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

¹ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

~~I certify that, in my opinion:~~

The ~~site is suitable~~ for the following uses:

~~(Tick all appropriate uses and strike out those not applicable.)~~

- ~~Residential, including substantial vegetable garden and poultry~~
 - ~~Residential, including substantial vegetable garden, excluding poultry~~
 - ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
 - ~~Day care centre, preschool, primary school~~
 - ~~Residential with minimal opportunity for soil access, including units~~
 - ~~Secondary school~~
 - ~~Park, recreational open space, playing field~~
 - ~~Commercial/industrial~~
 - ~~Other (please specify):~~
-

OR

- ~~I certify that, in my opinion, the site is not suitable for any use due to the risk of harm from contamination.~~

Overall comments:

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan² (EMP), the site is suitable for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

- ~~Residential, including substantial vegetable garden and poultry~~
- ~~Residential, including substantial vegetable garden, excluding poultry~~
- ~~Residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
- ~~Day care centre, preschool, primary school~~
- ~~Residential with minimal opportunity for soil access, including units~~
- ~~Secondary school~~
- ~~Park, recreational open space, playing field~~
- Commercial/industrial
- ~~Other (please specify):~~

EMP details

Title: Environmental Management Plan, Road Infrastructure Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204

Author: Alliance Geotechnical Pty Ltd

Date: 13 March 2024

No. of pages: 35

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

- ~~requires operation and/or maintenance of **active** control systems³~~
- requires maintenance of **passive** control systems only³.

² Refer to Part IV for an explanation of an environmental management plan.

³ Refer to Part IV for definitions of active and passive control systems.

Purpose of the EMP:

The purpose of the EMP is to facilitate the mitigation of unacceptable human health exposure risks to users of the site from the residual land contamination, within the proposed land use scenario.

Description of the nature of the residual contamination:

Friable asbestos, bonded asbestos containing material (ACM), and carcinogenic polycyclic aromatic hydrocarbons (PAHs) were present within the residual fill material across the entire site. Hydrocarbon odour was also detected within residual fill material in the north-eastern portion of the site. Contaminated fill material remaining on the site has been capped beneath capping layers in two distinct capping type areas (road area and landscaped area).

Summary of the actions required by the EMP:

Management activities are not required unless excavation activities are proposed beneath capping layers.

Inspections will be undertaken every 6 months across the surface of the site to document the condition of the cap, including the nature and extent of any grass dieback, erosion, potholes or cracking. Additional inspections will be undertaken following periods of heavy/prolonged rainfall or after works on site that disturb the capping layer.

The EMP will be subjected to periodical management review undertaken every 12 months or if there is a change in site use.

The EMP will be incorporated in the Operational Environmental Management Plan (OEMP), which has been prepared to address the CSSI 7400 conditions of approval.

How the EMP can reasonably be made to be legally enforceable:

The EMP is legally enforceable under the conditions of development consent and will have a covenant registered on the title to the land under s. 88B of the Conveyancing Act. The EMP can be made legally enforceable in the event of future development via a condition of any future development consent.

How there will be appropriate public notification:

A copy of the SAS and EMP will be submitted to Council so that it can be recorded on the Planning Certificate issued under Section 10.7 of the *Environmental Planning & Assessment Act 1979*.

Overall comments:

Development works initially required excavation and offsite disposal of surplus soils to achieve design levels. These works identified an underground storage tank (UST) in the

north-eastern portion of the site and waste classification assessment works identified the presence of asbestos and elevated concentrations of PAHs and metals. The UST was removed, and the resulting remedial excavation was validated. Based on the results of the tank pit validation, Alliance recommended additional investigations be undertaken of soils adjacent to the tank pit. Additional in situ investigations identified fill impacted by asbestos (bonded and/or friable) and carcinogenic PAHs across the entire site. Hydrocarbon odours were considered to present an aesthetic issue in the vicinity of the former UST along with aesthetic issues associated with two stockpiles (concrete and soil).

A remediation action plan (RAP) was prepared for the remediation of the identified asbestos (bonded and/or friable), carcinogenic PAHs and aesthetic issues associated with two stockpiles.

Remediation of fill at the site relied on the placement of a capping layer of specified form and thickness across the site to separate site users from residual soil contamination. The capping layer generally comprised the placement of a geotextile fabric material (to act as a separation and marker layer) prior to placement of capping materials (including imported materials).

To allow for the installation of the physical separation capping layers, remedial works included some limited earthworks for underground services. In addition, the soil stockpile and concrete stockpile identified in the RAP were disposed offsite.

An environmental management plan (EMP) has been prepared for the management of capping layers and the retained contamination.

Groundwater has not been assessed for any beneficial re-use. Any future use of groundwater would require appropriate assessment and regulatory approvals from the NSW Office of Water.

Section B

Purpose of the plan⁴ which is the subject of this audit:

I certify that, in my opinion:

(B1)

- ~~The nature and extent of the contamination **has** been appropriately determined~~
- ~~The nature and extent of the contamination **has not** been appropriately determined~~

AND/OR (B2)

- ~~The investigation, remediation or management plan **is** appropriate for the purpose stated above~~
- ~~The investigation, remediation or management plan **is not** appropriate for the purpose stated above~~

AND/OR (B3)

- ~~The site testing plan:~~
 - ~~**is** appropriate to determine~~
 - ~~**is not** appropriate to determine~~

~~if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

AND/OR (B4)

~~The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):~~

- ~~**have been** complied with~~
- ~~**have not** been complied with.~~

~~*voluntary management proposal no.~~

~~**management order no.~~

AND/OR (B5)

~~The site **can be made suitable** for the following uses:~~

~~(Tick all appropriate uses and strike out those not applicable.)~~

- ~~Residential, including substantial vegetable garden and poultry~~
- ~~Residential, including substantial vegetable garden, excluding poultry~~

⁴ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

- Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
- Day care centre, preschool, primary school
- Residential with minimal opportunity for soil access, including units
- Secondary school
- Park, recreational open space, playing field
- Commercial/industrial
- Other (please specify):

IF the site is remediated/managed* in accordance with the following plan (attached):

*Strike out as appropriate

Plan title

Plan author

Plan date

No. of pages

SUBJECT to compliance with the following condition(s):

Overall comments:

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997*.

Accreditation no. 1505

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997*, and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.



Signed

Date 7 June 2024

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of the *Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority:**
nswauditors@epa.nsw.gov.au or as specified by the EPA

AND

- the **local council** for the land which is the subject of the audit.



Environmental Management Plan

Project
Road Infrastructure
Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204

Prepared for
CPB Contractors PTY Limited & UGL Engineering PTY Limited
as Systems Connect Line-wide

Date
13/03/2024

Report No
9198.27-ER-3-6



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Document Control

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Final	13/03/2024	S. Inameti	C. Cowper	S. Inameti

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This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to Alliance's engagement. The report must not be used for any purpose other than the purpose specified at the time Alliance was engaged to prepare the report.

The findings presented in this report are based on specific data and information made available during the course of this project. To the best of Alliance's knowledge, these findings represent a reasonable interpretation of the general condition of the site at the time of report completion.

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.

Logs, figures, and drawings are generated for this report based on individual Alliance consultant interpretations of nominated data, as well as observations made at the time fieldwork was undertaken.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

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.

TABLE OF CONTENTS

1	Introduction	4
1.1	Background.....	4
1.2	Objectives	4
1.3	Scope of Work	4
2	Purpose.....	5
2.1	Reason, Purpose and Timeframe.....	5
2.2	Enforceability	5
2.3	Active or Passive	5
2.4	Responsible Parties.....	6
2.5	Location of Plan	6
3	Site Identification	7
3.1	Site Details.....	7
3.2	Site Layout.....	7
4	Site Environmental Setting.....	8
4.1	Geology.....	8
4.2	Site Topography and Elevation	8
5	Site Contamination History Relevant to EMP	9
6	Residual Contamination	10
6.1	Health Effects	10
6.1.1	Asbestos.....	10
6.1.2	PAH (as BaP TEQ)	10
6.1.3	Odour	11
6.2	Locations and 'As Constructed' Management.....	11
6.2.1	Public Road Area	11
6.2.2	Landscaped Areas	12
7	Management Activities	15
7.1	Register of Contacts	15
7.2	Consistency With Conditions of Consent	15
7.3	Existing Environmental Management System.....	15
7.4	Management Structure and Responsibilities	15
7.5	Approvals and Licensing.....	16
7.6	Operating Hours	16
7.7	Training.....	17
7.8	Planned Activities and Procedures.....	17
7.8.1	Safe Work Method Statements	17

7.8.2	Personal Protective Equipment (PPE)	17
7.8.3	Site Works	18
7.8.4	Workplace Asbestos Clearance	21
7.8.5	Decontamination	22
7.9	Monitoring of Site Conditions and Management Measures	22
7.10	Contingency Plans	22
7.11	Covenant and Notation	22
8	Management Review	23
8.1	Review of Plan and Reporting	23
8.2	Plan Amendment and Cessation	23
9	Conclusions	25
10	References	26

FIGURES

Figure 1	Site Locality & Layout Plan
Figure 2	Areas of Environmental Concern
Figure 3	Lateral Inferred Extent of Remediation
Figure 4	Lateral Inferred Extent of Capping Layers
Figure 5	Cross-sectional View of Capping Layers

APPENDICES

APPENDIX A – Survey Plan (Public Road and Landscaped Area Capping System)

1 Introduction

1.1 Background

Alliance Geotechnical Pty Ltd (Alliance) was engaged by CPB Contractors Pty Limited & UGL Engineering Pty Limited trading as Systems Connect Line-wide to prepare an environmental management plan (EMP) for a parcel of land at 1C Sydney Steel Road, Marrickville NSW 2204 (refer to the site location and boundary outlined in **Figure 1**).

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

- The subject site is comprised of a portion of Lot 1 in DP613757 (referred to as 'the site' from hereon) and covers an area of approximately 1,948m²;
- The site is road infrastructure and associated landscape strip/batter, which consists of paved surfaces and open space strips/ batters. The road will be used transiently by metro train maintenance facility workers to access the maintenance facility, while the open space strips / batters will provide transient pedestrian access between the road and the maintenance facility. In the context of NEPC (2013a), this is considered to be a land use scenario¹ that is reasonably compatible with:
 - Public open space such as parks, playgrounds, playing fields, (e.g. ovals), secondary schools and footpaths (but does not include undeveloped public open space such as urban bushland and reserves, which should be subject to site specific assessment where appropriate); and
 - This EMP is required to facilitate the ongoing management of residual friable and bonded asbestos, benzo(a)pyrene TEQ and hydrocarbon odour in soil land contamination risks that remain on site, so that the site remains suitable for the proposed land use scenario.

1.2 Objectives

The objectives of this project were to:

- Prepare an environmental management plan (EMP) for the site to address the following land contamination risks:
 - Friable and bonded asbestos, and benzo(a)pyrene TEQ impacted fill soil across the site; Hydrocarbon odour impacted material in the north-eastern portion of the site; and
- Document the site management requirements needed to facilitate the ongoing protection of onsite and offsite receptors.

1.3 Scope of Work

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

- A desktop review of previous reports; and
- Data assessment and reporting.

The nominated scope of works was undertaken with reference to relevant sections of NEPC (2013), NSW EPA (2020b), DIPNR (2004), and WA DOH (2009) as well as other references presented in **Section 10**.

¹ Adopted from Section 2.2 of NEPC (2013a) and Section 3 of NEPC (2013f)

2 Purpose

2.1 Reason, Purpose and Timeframe

The reason for this EMP is to provide a strategy for the management of residual land contamination at the site.

The purpose of this EMP is to facilitate the mitigation of unacceptable human health exposure risks to users of the site from the residual land contamination, within the scope of the proposed land use scenario.

This EMP:

- comes into effect immediately upon the site transitioning from a construction phase to an operational phase;
- will remain in force until such time as one or more of the following occurs:
- this EMP is superseded by a new or updated EMP; or
- the contamination is remediated in such a way that ongoing management is no longer required.

In the event that ongoing management of contamination is no longer required, then it may be appropriate to remove the notation on the site's planning certificate and/or covenant on title, of the requirement for this EMP.

2.2 Enforceability

This EMP is considered to be enforceable based on:

- opinions sought from the relevant authority (i.e., the local planning consent authority) on the legality of the EMP;
- advice from the local planning consent authority that exempt and complying development permitted on the land that this site falls on, will not be affected by the residual contamination;
- appropriate public notification of restrictions applying to the land, to ensure potential purchasers or other interested individuals are aware of the restrictions, has been made. Those notifications have included:
 - an appropriate notation on the planning certificate issued under s. 10.7 of the Environmental Planning and Assessment Act; and
 - a covenant registered on the title to the land under s. 88B of the Conveyancing Act.

The local planning consent authority does not require financial assurance in the context of implementing this EMP.

The implementation of the EMP will comply with all applicable legislation and regulatory instruments, standards, and frameworks in practice at the time of its application. The EMP will remain in force for the life of the proposed development, or until any remediation of the soil renders the area suitable for the intended land use(s) without the need for the containment and capping of potentially impacted soils.

2.3 Active or Passive

The method being implemented to manage residual contamination are considered to be passive in nature, on the basis that the methods implemented (if left undisturbed) do not require human intervention to ensure the ongoing performance of those methods.

2.4 Responsible Parties

The parties responsible for implementation and review / maintenance of this EMP, and their associated tasks, are set out in **Section 7**.

2.5 Location of Plan

The controlled master copy of this EMP will be held at Metro Trains Sydney (MTS) Site Office, located at 47 Tallawong Road, Rouse Hill NSW 2155.

3 Site Identification

3.1 Site Details

Site identification details are presented in **Table 3.1**.

Table 3.1 Site Identification Details

Cadastral Identification	Portion of Lot 1 in DP613757
Geographic Coordinates (Google Earth)	33°54'37.79"S and 151°10'8.48"E
Site Area	Approximately 1,948m ²
Local Government Authority	Inner West Council
Current Zoning	IN1 – General Industrial

3.2 Site Layout

The layout of the site is present in **Figure 1**.

4 Site Environmental Setting

4.1 Geology

A summary of the conditions at the site is presented in **Table 4.1**.

Table 4.1. Site Specific Geology

Unit	Description	Depth (m bgl)
Pavement	Asphalt Slab. (Road portion only)	0.0-0.2
Mulch	Wood chip, leaves, bark chip. (landscape portion only)	0.0-0.1
Topsoil	SILT, low plasticity, dark brown with some sand, clay, trace wood chip, moist. (landscape portion only)	0.0-0.2
Capping Layer Fill	Gravelly SAND, fine to coarse grained, grey/dark grey with gravel & cobbles of sandstone, trace shotcrete, some clay, moist.	0.2-0.95
Marker Layer	White geo-textile fabric	0.2-0.95
Fill	Gravelly SAND, fine to coarse grained, dark brown/brown/grey/black with some silt, trace clay, gravel and cobbles of sandstone, strip of metal, concrete fragments, terracotta bricks, boiler ash, fragments of glass, wood, shale, geotextile fabric, plastic, moist.	0.55-2.0
Fill	Gravelly CLAY, medium to high plasticity, grey/brown with terracotta bricks, gravel of sandstone, fragments of tiles, moist.	0.55-2.0
Fill	Sandy CLAY, low to high plasticity, brown/grey/orange with gravel and cobbles of sandstone, terracotta bricks, fragments of ceramic pipes, tiles, moist.	1.5-2.0
Fill	Clayey SAND, fine to coarse grained, grey/brown with trace silt, gravel of sandstone, terracotta bricks, fragments of ceramic pipe, tiles, boiler ash, moist.	2.0-2.1
Natural	CLAY, high plasticity, grey/brown mottled brown/orange, moist	>0.5

4.2 Site Topography and Elevation

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

- the topography of the site is gently sloping towards the south-west; and
- the surface of the site was located at an elevation of 2.647m Australian Height Datum (AHD) in the south-west and 3.779m AHD in the north-east.

A registered survey of the site boundary is presented in **Appendix A**.

5 Site Contamination History Relevant to EMP

A copy of the following reports, considered relevant to this EMP, were reviewed:

- Alliance 2022a, 'Underground Petroleum Storage System – Tank Pit Validation, 1C Sydney Steel Road, Marrickville NSW' dated 11 October 2022, ref: 9198.27-ER-3-1;
- Alliance 2022b, 'Detailed Site Investigation, 1C Sydney Steel Road, Marrickville NSW' dated 27 October 2022, ref: 9198.27-ER-3-3;
- Alliance 2022c, 'Remedial Action Plan, 1C Sydney Steel Road, Marrickville NSW' dated 25 November 2022, ref: 9198.27-ER-3-4_Rev02; and
- Alliance 2023, 'Site Remediation and Validation Report, Portion of 1C Sydney Steel Road, Marrickville NSW' dated 22 September 2023, ref: 9198.27-ER-3-5_Rev02.

Based on the review of previous assessments conducted at the site, in the context of land contamination risks at the site, Alliance provides the following site history summary relevant to existing contamination requiring management:

- An underground petroleum storage system (UPSS), used for storage and dispensing of unleaded petrol, located adjacent to the north-eastern property boundary, was decommissioned and removed from the site. Following the decommission and removal works, a validation assessment of the UPSS pit was reported in Alliance (2022a);
- Evidence of tank leakage in soil and tank pit validation laboratory analytical results, was not observed. Evidence of potential land contamination was identified within soils (specifically lead and benzo(a)pyrene TEQ) in the tank pit, likely associated with uncontrolled fill;
- Following the UPSS pit validation works, a detailed site investigation of the site was reported in Alliance (2022b). Concentrations of bonded and friable asbestos, B(a)P TEQ and hydrocarbon odour (likely associated with previous removed UPSS) were identified above the site assessment criteria. It was recommended that a remedial action plan (RAP) be prepared to address the identified unacceptable human health exposure risks and odour aesthetic risk; and
- Remedial works included onsite containment of the sources identified, with a capping system comprising:
 - the installation of a white geotextile fabric marker layer, placement of imported subgrade material (Gravelly SAND), DGB20 aggregate, 7mm emulsion primer seal and AC14 asphalt hardstand layer across the road portion (as a capping layer);
 - the installation of a white geotextile fabric marker layer and placement of imported subgrade material (Gravelly SAND and topsoil) across the landscaped portion, as a capping layer; and
 - lining of trenches, footings and pits associated with proposed in-ground services, light poles and drains respectively with the white geotextile fabric marker layer and extending the white geotextile fabric marker layer approximately 0.5m beyond the edges of those excavations, prior to installation of capping system.
- Remediation and validation work commenced on site on 29 November 2022 and was completed on 5 May 2023. The remediation objective was achieved on the basis the identified unacceptable human health exposure risks and odour aesthetic risk (exposure pathways) were controlled by onsite containment with long term management required.

6 Residual Contamination

Residual land contamination risks at the site, that are the subject of this EMP, are summarised below.

6.1 Health Effects

6.1.1 Asbestos

The Agency for Toxic Substances and Disease Registry (<https://www.atsdr.cdc.gov/>) advises that:

- Breathing asbestos can cause tiny asbestos fibres to get stuck in the lungs and irritate lung tissues.
- Scientific studies have shown that the following non-cancer diseases can be caused by breathing asbestos:
 - Asbestosis is scarring in the lungs caused by breathing asbestos fibres. Oxygen and carbon dioxide do not pass in and out of scarred lungs easily, so breathing becomes harder. Asbestosis usually occurs in people who have had very high exposures over a long time, but years may pass before any symptoms appear.
 - Pleural disease is a non-cancerous lung condition that causes changes in the membrane surrounding the lungs and chest cavity (pleura). The membrane may become thicker throughout (diffuse pleural thickening) or in isolated areas (pleural plaques), or fluid may build up around the lungs (known as a pleural effusion). Not everyone with pleural changes will have problems breathing, but some may have less efficient lung function.
- Asbestos exposure also increases the risk of developing certain cancers:
 - Lung cancer is a malignant tumour that invades and blocks the lung's air passages. Smoking tobacco combined with asbestos exposure greatly increases the chance of developing lung cancer.
 - Mesothelioma, is a rare cancer of the membrane that covers the lungs and chest cavity (pleura), the membrane lining the abdominal cavity (peritoneum), or membranes surrounding other internal organs. Signs of mesothelioma may not appear until 30 to 40 years after exposure to asbestos.

In addition to lung cancer and mesothelioma, asbestos exposure can also cause cancer of the larynx and ovary. Current evidence also suggests asbestos exposure may cause cancer of the pharynx, stomach, and colorectum.

6.1.2 PAH (as BaP TEQ)

The Agency for Toxic Substances and Disease Registry (<https://www.atsdr.cdc.gov/>) advises that:

- The most significant endpoint of PAH toxicity is cancer.
- PAHs generally have a low degree of acute toxicity to humans. Some studies have shown noncarcinogenic effects that are based on PAH exposure dose.
- After chronic exposure, the non-carcinogenic effects of PAHs involve primarily the:
 - pulmonary,
 - gastrointestinal,
 - renal, and dermatologic systems.
- Many PAHs are only slightly mutagenic or even non-mutagenic in vitro; however, their metabolites or derivatives can be potent mutagens.

6.1.3 Odour

The Agency for Toxic Substances and Disease Registry (<https://www.atsdr.cdc.gov/>) advises that:

- Unpleasant odours can be a warning sign of potential risks to human health;
- Community members have reported that smelling odours in the air decreases their quality of life and sense of wellbeing; and
- Odours from environmental sources might also cause health symptoms, depending on individual and environmental factors.

6.2 Locations and 'As Constructed' Management

Friable asbestos, bonded asbestos containing material (ACM), and Benzo(a)pyrene TEQ (BaP TEQ) were observed within the residual fill material across the entire site. The friable asbestos, bonded ACM and BaP TEQ detected were likely associated with previous uncontrolled demolition of former structures and uncontrolled filling on the site. The total contamination management works was nominally 1,948m² to a depth of 1.5m, with an indicative volume of ~2,920m³. The location of these impacted soils is presented in **Figure 2**.

Hydrocarbon odour was also detected within residual fill material in the north-eastern portion of the site. This was likely associated with previous underground petroleum storage system (UPSS) on site, which has been removed and validated. The total contamination management works was nominally 100m² to a depth of 0.5m, with an indicative volume of 50m³. The location of these impacted soils is presented in **Figure 2**.

6.2.1 Public Road Area

Contamination management works for public road location included:

- Placement of a marker layer across the extent of the public road area, where friable asbestos, bonded (ACM), BaP TEQ, and hydrocarbon odour impacted soils are located. The marker layer was comprised of a white geotextile membrane, with each sheet of membrane overlapped by approximately 0.3m to 0.4m, and each sheet pinned to the underlying soil. The elevation and extent of the marker layer was surveyed, and a copy of the survey drawing is presented in **Appendix A**;
- Placement, spreading and compaction of a minimum 0.608m thick layer of grey/dark grey subgrade material (Gravelly SAND), DGB20 aggregate, 7mm emulsion primer seal and AC14 asphalt hardstand, to act as a capping layer. The elevation and extent of the capping layer was surveyed, and a copy of the survey drawing is presented in **Appendix A**; and
- The elevation and extent of the asphalt layer was surveyed, and a copy of the survey drawing is presented in **Appendix A**.

The capping layer prevents the exposure pathway between the friable asbestos, bonded (ACM), BaP TEQ, and hydrocarbon odour impacted soils, and site users identified as part of the land use scenario for the site, from becoming complete. The lateral extent of the public road area is presented in **Figure 4** and the cross-sectional extent of the public road is presented in **Figure 5**.

Image 6.2.1.1 View of geo-textile marker layer across public road facing portion north-east showing overlap.



Image 6.2.1.2 View of subgrade material placed across public road portion.



Image 6.2.1.3 View of asphalt emulsion placed across road portion.



6.2.2 Landscaped Areas

Contamination management works for landscaped areas included:

- Placement of a marker layer across the extent of all landscaped areas, where friable asbestos, bonded (ACM), B(a)P TEQ and hydrocarbon odour impacted soils are located. The marker layer was comprised of a white geotextile membrane with each sheet of membrane overlapped by approximately 0.3m to 0.4m, and each sheet pinned to the underlying soil. The geotextile marker layer placed along the northern and southern boundary of the site was extended 0.5m beyond the site boundary, where

practical. It was however noted that some sections of the geotextile marker layer across the southern boundary could only be extended about 0.1m to 0.2m beyond the site boundary due to the presence of a fence, which marked the site boundary. The elevation and extent of the marker layer was surveyed, and a copy of the survey drawing is presented in **Appendix A**;

- Placement, spreading and compaction of a minimum 0.545m thick layer of grey/dark grey subgrade material (Gravelly SAND) and 'topsoil, to act as a capping layer, followed by planting of grass and shrub vegetation over the capping layer. A layer of mulch consisting of woodchips, leaves and bark chips was observed to have been spread over the planted vegetation (as indicated in **Section 4.1**), with trace sandstone gravels and fragments of ceramic tiles. The elevation and extent of the capping layer was surveyed, and a copy of the survey drawing is presented in **Appendix A**; and.
- The elevation and extent of the capping layer was surveyed, and a copy of the survey drawing is presented in **Appendix A**.

The capping layer prevents the exposure pathway between the friable asbestos, bonded (ACM), B(a)P TEQ, and hydrocarbon odour impacted soils, and site users identified as part of the land use scenario for the site, from becoming complete. The lateral extent of the landscaped area is presented in **Figure 4** and the cross-sectional extent of the landscaped area is presented in **Figure 5**.

Image 6.2.2.1 View of geotextile marker layer along the north-western boundary of landscaped area.



Image 6.2.2.2 View of subgrade material placed across landscaped area.



Image 6.2.2.3 View of topsoil material placed across landscaped area.



Image 6.2.2.4 View of finished landscaped area including mulch.



7 Management Activities

7.1 Register of Contacts

A register of contact details of stakeholders considered relevant to the project, is presented in **Table 7.1**.

Table 7.1 Register of Contacts

Role	Person	Stakeholder	Contact
Emergency Services	-	Police / Fire Ambulance	000
Planning Authority	-	NSW Department of Planning and Environment	1300 420 596
WHS Regulatory Authority	-	SafeWork NSW	131 050
Environmental Regulatory Authority	-	NSW EPA	131 555
Landowner	-	Sydney Metro	(02) 8265 9400
Site Occupant	-	Metro Train Sydney	(02) 9854 4844

7.2 Consistency With Conditions of Consent

The conditions of approval issued by NSW Department of Planning and Environment to meet Critical State Significant Infrastructure (ref: CSSI 7400²) included requirements in Section E66 and E67 for a site contamination report to be prepared and a site audit by a NSW EPA accredited site auditor to determine the suitability of the site for a specified use. This EMP addresses that condition of approval.

7.3 Existing Environmental Management System

This EMP will be incorporated in the client's Operational Environmental Management Plan (OEMP), which has been prepared to address the CSSI 7400 conditions of approval.

Sydney Metro will be responsible for notifying the appropriate stakeholders of the updates made to the OEMP, once this EMP comes into effect (immediately upon the site transitioning from a construction phase to an operational phase).

7.4 Management Structure and Responsibilities

The management structure (responsible parties) and responsibilities (tasks) for this EMP are presented in **Table 7.4**.

² CSSI 7400: Critical State Significant Infrastructure Sydney Metro City & Southwest Chatswood to Sydenham Conditions of Approval, NSW Government Department of Planning and Environment.

Table 7.4 Responsible Parties and Tasks

Responsible Party	Tasks
Landowner – Sydney Metro	<p>Overall ownership of and responsibility for this EMP.</p> <p>Provide a copy of this EMP to the site occupant (Metro Train Sydney, General Manager Safety, Quality, Risk and Environment.) and contractors on site.</p> <p>Induct into, and train Site Occupant and contractors on, the relevant aspects of this EMP.</p> <p>Ensure the implementing of relevant protocols and procedures in this EMP.</p> <p>Overall modification and management review of this EMP.</p> <p>Implement relevant protocols and procedures in this EMP.</p>
Site Occupant – Metro Train Sydney (MTS)	<p>Provide a copy of this EMP to MTS General Manager (GM) Operations & Customer Experience, and MTS GM Engineering & Maintenance Delivery.</p> <p>Induct into, and train contractors on, the relevant aspects of this EMP.</p> <p>Ensure the MTS General Manager (GM) Operations & Customer Experience, and MTS GM Engineering & Maintenance Delivery is implementing the relevant protocols and procedures in this EMP.</p>
General Manager Safety, Quality, Risk and Environment.	<p>Initial management review of this EMP.</p> <p>Implement relevant protocols and procedures in this EMP.</p>
MTS General Manager	<p>Provide a copy of this EMP to the Environment and Sustainability Advisor, prior to any works commencing on site.</p> <p>Ensure the MTS Environment and Sustainability Advisor is implementing the relevant protocols and procedures in this EMP.</p>
Operations & Customer Experience; and Engineering & Maintenance Delivery	
MTS Environment and Sustainability Advisor	<p>Induct into and train employees, contractors and visitors on, the relevant aspects of this EMP.</p> <p>Inspection of the surface of the capped area (as required and outlined).</p>
Employees	Implement relevant protocols and procedures in this EMP
Contractors	Implement relevant protocols and procedures in this EMP
Visitors	Implement relevant protocols and procedures in this EMP

7.5 Approvals and Licensing

Approval to manage the residual contamination at the site, has been provided by NSW Department of Planning and Environment, via CSSI7400 Condition of approval, including E67, and associated Site Audit Report and Site Audit Statement.

There are no licenses applicable to the operation of this EMP.

7.6 Operating Hours

The hours of operation at the site will be:

- 24 hours per day and 7 days a week.

7.7 Training

All employees and contractors undertaking works on, or in the immediate vicinity of, the land that is the subject of this EMP, will undergo training to ensure they understand their obligations under this EMP. Training will include:

- a site induction;
- familiarisation with the requirements of this EMP;
- familiarisation with site environmental controls; and
- targeted environmental training for specific personnel, for example, specific training in dust management, or use of relevant personal protective equipment (PPE); and
- environmental emergency response training.

Training records will be maintained, and will include:

- the date of the training;
- the name of the trainer;
- the scope of the training;
- the names of personnel trained on this EMP; and
- information on how competency was assessed.

The need for additional training or revised training will be assessed based on the outputs of monitoring and review of EMP implementation.

7.8 Planned Activities and Procedures

The following subsections provide guidance on planned disturbance of land that is the subject of this EMP.

The tasks to be undertaken must be planned in the context of this EMP, to enable assessment of what depth the capping system could be disturbed and what health and safety mitigation measures will need to be implemented. Any works that involve disturbance to impacted material below the white geo-textile marker layer will require as a minimum:

- an asbestos notification submitted to SafeWork NSW; and
- a class A asbestos removal supervisor.

7.8.1 Safe Work Method Statements

All parties intending to undertake planned disturbance in areas that are the subject of this EMP, will prepare a project specific 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.

7.8.2 Personal Protective Equipment (PPE)

Impacted soils will be encountered if excavation extends beyond the capping layer system, which could result in asbestos, benzo(a)pyrene TEQ and hydrocarbon odour exposure. The following personal protective equipment (PPE) will be worn (as a minimum) by all persons working on, or visiting, the site:

- 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);
- safety hard hat;
- disposable gloves and disposable boot covers (if required);
- disposable coveralls (type 5, category 3 (EN ISO 13982–1) or equivalent that would meet this standard;
- coveralls worn should be made from either 100% synthetic material or a mixed natural / synthetic fabric capable of providing adequate protection against fibre penetration. All fabrics must be capable of preventing the penetration of asbestos fibres down to a diameter of 0.5µm and to a maximum 1% penetration of all airborne asbestos fibres. Once worn, disposable overalls are not to be reused or laundered;
- disposable half-face particulate respirator (P2 rated): The respirator must conform to the requirements of AS/NZS 1716:2009 Selection, Use and Maintenance of Respiratory Protective Devices or its equivalent. These disposable respirators must be replaced at each decontamination event; 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.

7.8.3 Site Works

7.8.3.1 Installation and Maintenance of Underground Services

For the purpose of this section of the EMP, underground services include, but are not limited to gas, water, sewer, power and telecommunications.

In the event that new underground services need to be installed, or maintenance on existing underground services needs to be undertaken on the site, a notification of the intended works will be sent to the MTS GM Operations & Customer Experience and MTS GM Engineering & Maintenance Delivery for review and approval. Depending on the nature of the works, the following may also be required:

- approval from the relevant consent authority (e.g. development works); and
- an asbestos notification submitted to SafeWork NSW (e.g. removal works).

Prior to the commencement of the capping layer being disturbed, the work area will be fenced off, relevant signage put in place, and sediment controls installed (where appropriate).

Atmospheric monitoring will be undertaken (subject to the findings of the risk assessment in the relevant SWMS), or as may be recommended by a suitably experienced occupational hygienist or licensed asbestos assessor (LAA).

Installation and/or maintenance works involving soil disturbance beneath the capping and marker layers will be undertaken by suitably licensed asbestos contractors.

Soils excavated from above the capping layer should be stockpiled separately. Care should be taken during excavation works and stockpiling, as each layer needs to be reinstated in a comparable manner (including layering) and thickness to the existing capping layer.

Soils excavated from beneath the marker layer will be either:

- Stockpiled for burial beneath the marker layer during works completion (stockpiles will be placed on plastic sheeting, wetted down and covered with plastic); or
- Removed for offsite disposal, with reference to NSW EPA (2014a).

In the event any of the marker layer is removed during installation / maintenance works, that section of marker layer will be replaced with geofabric, prior to underground services being installed/reinstated (in the same manner as the original geofabric marker layer).

Service trenches will only be backfilled with either VENM and / or material that meets the definition of an appropriate NSW EPA resource recovery order/exemption. Excavated material from beneath the marker layer will not be placed in service trenches.

All sections of the capping layer will be reinstated to similar layer and thickness comparable to the existing capping layer as set out in **Section 6.2.1** and **Section 6.2.2**.

Vegetation will be reinstated with seeding and maintenance until soils are adequately covered and stabilised with grasses.

Wastes generated during installation and maintenance works will be removed from site for disposal, with reference to NSW EPA (2014a). The 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;
- the quantity of the load of waste removed from site;
- waste receipt docket from the waste receiving facility; and
- weighbridge docket from the waste receiving facility.

The following decontamination procedure will apply to all persons who undertake work below the capping layer:

- 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).

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

At the completion of the capping layer reinstatement works, an asbestos clearance certificate will be obtained from a licensed asbestos assessor (LAA).

A record of the location of the underground service that was installed or subjected to maintenance, including photographs of reinstatement of marker layers and capping layers, will be kept and submitted to the MTS GM Operations & Customer Experience and MTS GM Engineering & Maintenance Delivery.

7.8.3.2 Repairs Due to Aging and Deterioration

The soil capping system will be protected from general deterioration by maintaining grass cover across the capped landscaped area and asphalt cover across the public road area. General deterioration:

- in the landscaped areas may appear as grass dieback or erosion; and
- in the public road area, may appear as cracking or potholes.

Grass dieback will be repaired by planting new grass (and potentially replacement of the topsoil / growing medium).

Erosion will be filled, using engineered materials, by a suitably experienced contractor and placement of an appropriate topsoil / growing medium. Grass will be reinstated in repaired areas.

Cracks and potholes will be investigated to establish the cause, and rectification works undertaken, adopting similar practices (where applicable) to those set out in **Section 7.8.3.1** of this EMP. Rectification works will be undertaken by a suitably experienced contractor.

At the completion of the repair works, an asbestos clearance certificate will be obtained from a licensed asbestos assessor (LAA).

A record of the location of the repair, and the scope of work undertaken, including photographs of reinstatement of marker layers and capping layers, will be kept and submitted to MTS GM Operations & Customer Experience and MTS GM Engineering & Maintenance Delivery.

7.8.3.3 Installation and Maintenance of Landscape

For the purpose of this section of the EMP, landscape include, but are not limited to grass, shrubs, and trees.

In the event that new landscape needs to be installed, or maintenance on existing landscape needs to be undertaken on the site, a notification of the intended works will be sent to the MTS GM Operations & Customer Experience and MTS GM Engineering & Maintenance Delivery for review and approval. Depending on the nature of the works, the following may also be required:

- approval from the relevant consent authority (e.g. development); and
- an asbestos notification submitted to SafeWork NSW (e.g. removal works).

Prior to the commencement of the capping layer being disturbed, the work area will be fenced off, relevant signage put in place, and sediment controls installed (where appropriate).

Atmospheric monitoring will be undertaken (subject to the findings of the risk assessment in the relevant SWMS), or as may be recommended by a suitably experienced occupational hygienist or licensed asbestos assessor (LAA).

Installation and/or maintenance works involving soil disturbance beneath the capping and marker layers will be undertaken with a suitably licensed asbestos contractor present.

Soils excavated from above the capping layer should be stockpiled separately. Care should be taken during excavation works and stockpiling, as each layer needs to be reinstated in a comparable manner (including layering) and thickness to the existing capping layer.

Soils excavated from beneath the marker layer will be either:

- Stockpiled for burial beneath the marker layer during works completion (stockpiles will be placed on plastic sheeting, wetted down and covered with plastic); or

- Removed for offsite disposal, with reference to NSW EPA (2014a).

In the event any of the marker layer is removed during installation / maintenance works, that section of marker layer will be replaced with geofabric (where possible), prior to landscape being installed/reinstated (in the same manner as the original geofabric marker layer).

All sections of the capping layer will be reinstated to similar layer and thickness comparable to the existing capping layer.

Vegetation will be reinstated with seeding and maintenance until soils are adequately covered and stabilised with grasses.

Wastes generated during installation and maintenance works will be removed from site for disposal, with reference to NSW EPA (2014a). The 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;
- the quantity of the load of waste removed from site;
- waste receipt docket from the waste receiving facility; and
- weighbridge docket from the waste receiving facility.

The following decontamination procedure will apply to all persons who undertake work below the capping layer:

- 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).

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

At the completion of the capping layer reinstatement works, an asbestos clearance certificate will be obtained from a licensed asbestos assessor (LAA).

A record of the location of the landscape that was installed or subjected to maintenance, including photographs of reinstatement of marker layers and capping layers, will be kept and submitted to MTS GM Operations & Customer Experience and MTS GM Engineering & Maintenance Delivery.

7.8.4 Workplace Asbestos Clearance

A licensed asbestos assessor (LAA) will be required to conduct control asbestos air monitoring during any excavation works below the capping layer.

At the completion of works and reinstatement of the capping layer, the LAA is to complete the following:

- perform a clearance inspection of the works area;
- undertake clearance air monitoring show that any identified respirable asbestos fibre levels are below 0.01 fibres / ml; and
- issue an asbestos clearance certificate before the site area can be re-occupied.

7.8.5 Decontamination

The following decontamination procedure will apply to all persons who undertake work below the capping layer:

- 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).

The following decontamination procedure will apply to plant and equipment used to undertake work below the capping layer:

- A nominated decontamination area for plant and equipment will be erected during asbestos removal / handling work;
- At the completion of asbestos works, plant and equipment used during the works will be decontaminated by the licensed removalist contractor;
- At the completion of the decontamination works, the LAA or qualified occupational hygienist shall undertake an asbestos clearance inspection of decontaminated plant and equipment; and
- Records of these asbestos clearance inspections will be provided to the project owner by the LAA / qualified occupational hygienist once completed.

7.9 Monitoring of Site Conditions and Management Measures

Inspections will be undertaken across the surface of the capped area. The inspections will be undertaken by the Environment and Sustainability Advisor. The inspections will document the nature and extent of any grass dieback, erosion, pothole or cracking, and include a photographic record of the capped area (and the grass dieback, erosion, potholes and surface soil cracks observed).

Each record of inspection will be maintained by the Environment and Sustainability Advisor.

The inspection will be undertaken every 6 months, after the implementation date of this EMP. Additional inspections will be undertaken following periods of heavy / prolonged rainfall or after works on site that disturb the capping layer.

7.10 Contingency Plans

In the event that an environmental management strategy in this EMP does not performed as designed (e.g. excessive cracking, potholing or some other performance failure), one or more of the following contingency measures may be considered and implemented:

- removal of the capping material, and reinstating with a more suitable or alternatively designed capping system;
- treatment of the impacted soils in a way that reduces the unacceptable land contamination risk to an acceptable level;
- amend the land use scenario, to facilitate any alternative risk management strategy.

Relevant procedures in **Section 7.8** will be applied during implementation of contingency plans.

7.11 Covenant and Notation

There has been appropriate public notification of any restrictions applying to the land to ensure that potential purchasers or other interested individuals are aware of the restrictions, including appropriate notations on the planning certificate issued under s.10.7 (2) of the Environmental Planning and Assessment Act and a covenant registered on the title to land under s.88B of the Conveyancing Act 1919.

8 Management Review

8.1 Review of Plan and Reporting

The EMP will be subjected to periodical management review, to ensure its ongoing applicability, suitability and effectiveness.

The initial review will be undertaken by the MTS GM Safety, Quality, Risk and Environment, in consultation with the MTS Environment and Sustainability Advisor, MTS General Manager (GM) Operations & Customer Experience, and MTS GM Engineering & Maintenance Delivery.

The review will include:

- a check on whether relevant records (generated during inspections set out in **Section 7.9**) are being adequately maintained; and
- identification of opportunities for improvement on implementation of this EMP.

A review of the plan will be undertaken every 12 months or if there is a change in site use resulting in an impact to the subject area, from the date of implementation of this EMP.

Should the review identify a need to modify this EMP, the MTS GM Safety, Quality, Risk and Environment will communicate that need to the Landowner - Sydney Metro.

The report for the management review will include:

- Date of review and names of parties involved;
- Site identification details;
- A summary of planned disturbance work undertaken during the review period (if any);
- A summary of the findings of periodic inspections;
- A summary of unplanned disturbances and corrective / preventative actions implemented;
- Identification of opportunities for improvement; and
- Recommendations for amendments and/or removal of the EMP.

A record of each review report will be maintained by the Environment and Sustainability Advisor, and a copy of each review record forward to the Landowner - Sydney Metro.

8.2 Plan Amendment and Cessation

Should a management review of the plan identify:

- a need to amend the plan in order to address an opportunity for improvement; or
- that management of existing / residual contamination can be ceased.

Then a report containing

- information setting out the proposed amendment or intention to cease contamination management; and
- reasoning to support the change or intention to cease,

will be submitted to the relevant regulatory authority and/or consent authority.

The existing EMP will remain in force until approval to amend or cease has been received by the Landowner - Sydney Metro.

9 Conclusions

Alliance considers that the residual friable and bonded asbestos, benzo(a)pyrene TEQ and hydrocarbon odour in soil land contamination identified at the site, would not present an unacceptable human health risk (in the context of the adopted land use scenario), subject to compliance with this environmental management plan.

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

10 References

Alliance 2022a, 'Underground Petroleum Storage System – Tank Pit Validation, 1C Sydney Steel Road, Marrickville NSW' dated 11 October 2022, ref: 9198.27-ER-3-1.

Alliance 2022b, 'Detailed Site Investigation, 1C Sydney Steel Road, Marrickville NSW' dated 27 October 2022, ref: 9198.27-ER-3-3.

Alliance 2022c, 'Remedial Action Plan, 1C Sydney Steel Road, Marrickville NSW' dated 25 November 2022, ref: 9198.27-ER-3-4_Rev02.

Alliance 2023, 'Site Remediation and Validation Report, Portion of 1C Sydney Steel Road, Marrickville NSW' dated 22 September 2023, ref: 9198.27-ER-3-5_Rev02.

DIPNR 2004, 'Guideline for the Preparation of Environmental Management Plans'

Douglas Partners 2018 (DP (2018)), 'Preliminary Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Marrickville Dive, Murray Street, Marrickville, NSW' dated March 2018, ref: 85608.15.R.001.Rev0.

Douglas Partners 2020 (DP (2020a)), 'Detailed Site Investigation, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Marrickville Dive, Murray Street, Marrickville, NSW' dated March 2020, ref: 85608.16.R.001.Rev2.MVSY.

Douglas Partners 2020 (DP (2020b)), 'Remediation Action Plan, Sydney Metro City and South West, Tunnel and Station Excavation Works Package, Proposed Marrickville Dive, Murray Street, Marrickville, NSW' dated March 2020, ref: 85608.15.R.001.Rev0.

Douglas Partners 2021 (DP (2021)), 'Report on Validation of Remediation, Sydney Metro City & South West - TSE Works Package, Excavation Areas for Culvert Realignment and Associated Works, Murray Street, Marrickville', dated 24 May 2021, ref:85608.16.R.003.Rev0.

NSW DPIE 2021, 'State Environmental Planning Policy (Resilience and Hazards) 2021'

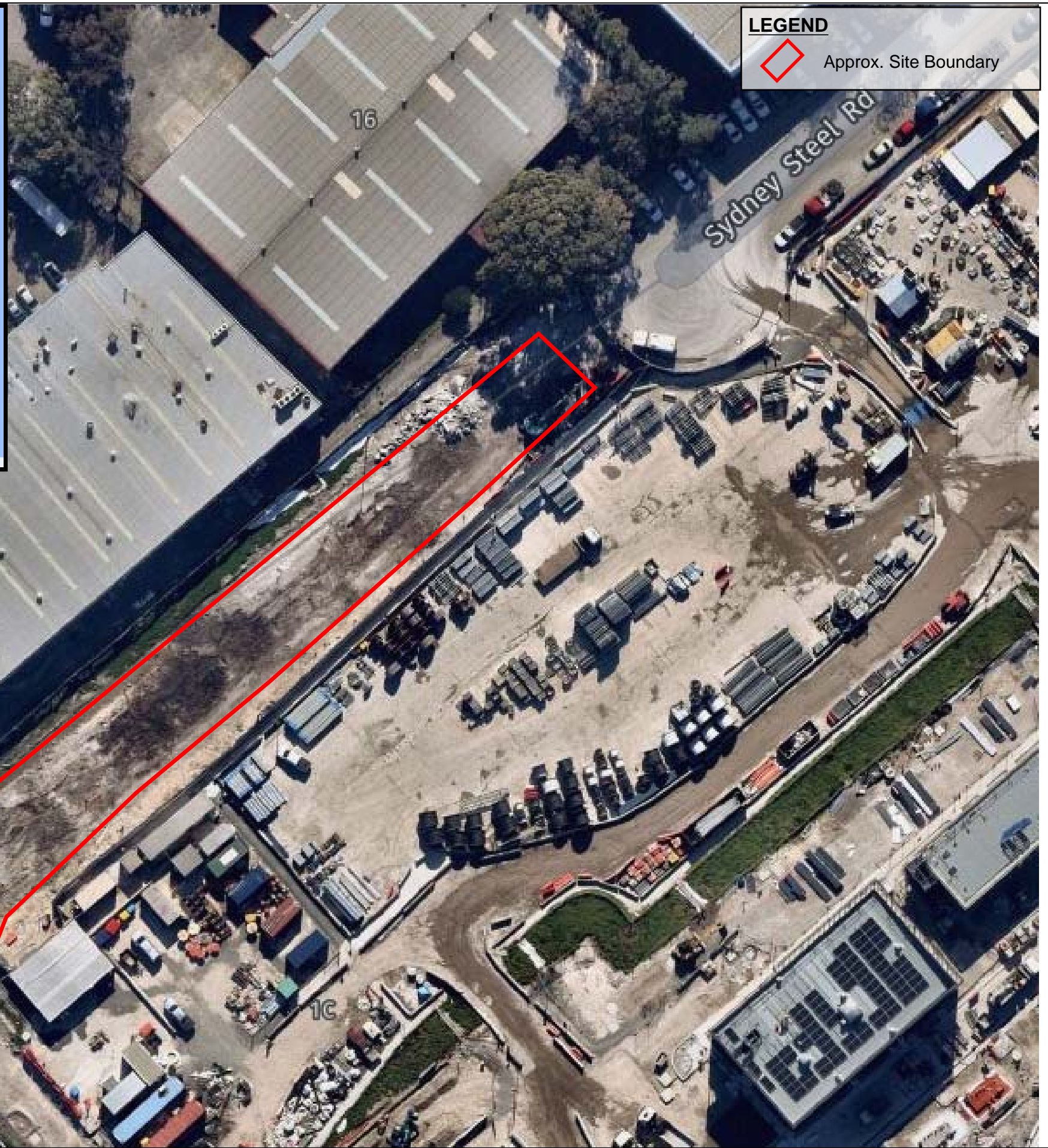
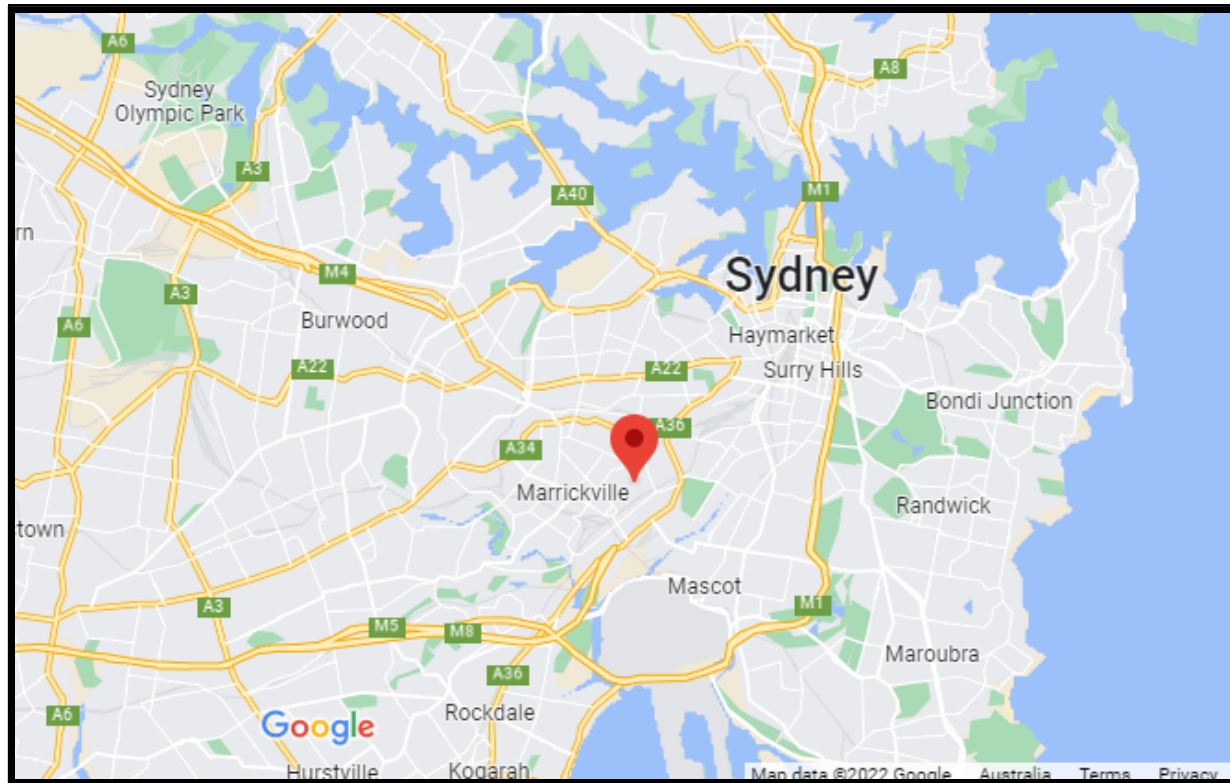
Site Auditor Scheme (3rd edition)', dated October 2017, ref: EPA 2017P0269.

NSW EPA 2020b, 'Contaminated Land Guidelines: Consultants reporting on contaminated land' dated May 2020, ref: EPA2020P2233.


Ramboll Australia Pty Ltd 2021 (Ramboll (2021)), 'Site Audit Report, Auditable areas of the Culvert Realignment & Associated Works – Sydney Metro Marrickville', dated 25 May 2021, ref: 318000323-009, Audit number TO-024-7.

WA DOH 2009, 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia', dated May 2009.

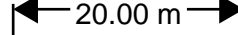
FIGURES





LEGEND

 Approx. Site Boundary



Scale:  20.00 m

Site Locality and Layout Plan

	Client Name:	CPB Contractors PTY Limited & UGL Engineering PTY Limited As Systems Connect Line-wide	Figure Number:	1	
	Project Name:	Environmental Management Plan – Road Infrastructure	Figure Date:	05 October 2023	
	Project Location:	1C Sydney Steel Road, Marrickville	Report Number:	9198.27-ER-3-6	

LEGEND

- Approx. Site Boundary
- Approx. Location of Friable and Bonded Asbestos, and Benzo(a)pyrene TEQ
- Approx. Location of Hydrocarbon Odour



Scale:
←
→
 20.00 m

Area of Environmental Concern Plan

	Client Name: CPB Contractors PTY Limited & UGL Engineering Limited As Systems Connect Line-wide	Figure Number: 2	
	Project Name: Environmental Management Plan – Road Infrastructure	Figure Date: 05 October 2023	
	Project Location: 1C Sydney Steel Road, Marrickville	Report Number: 9198.27-ER-3-6	

LEGEND

- Approximate site boundary
- Approximate Lateral Extent of Remediation

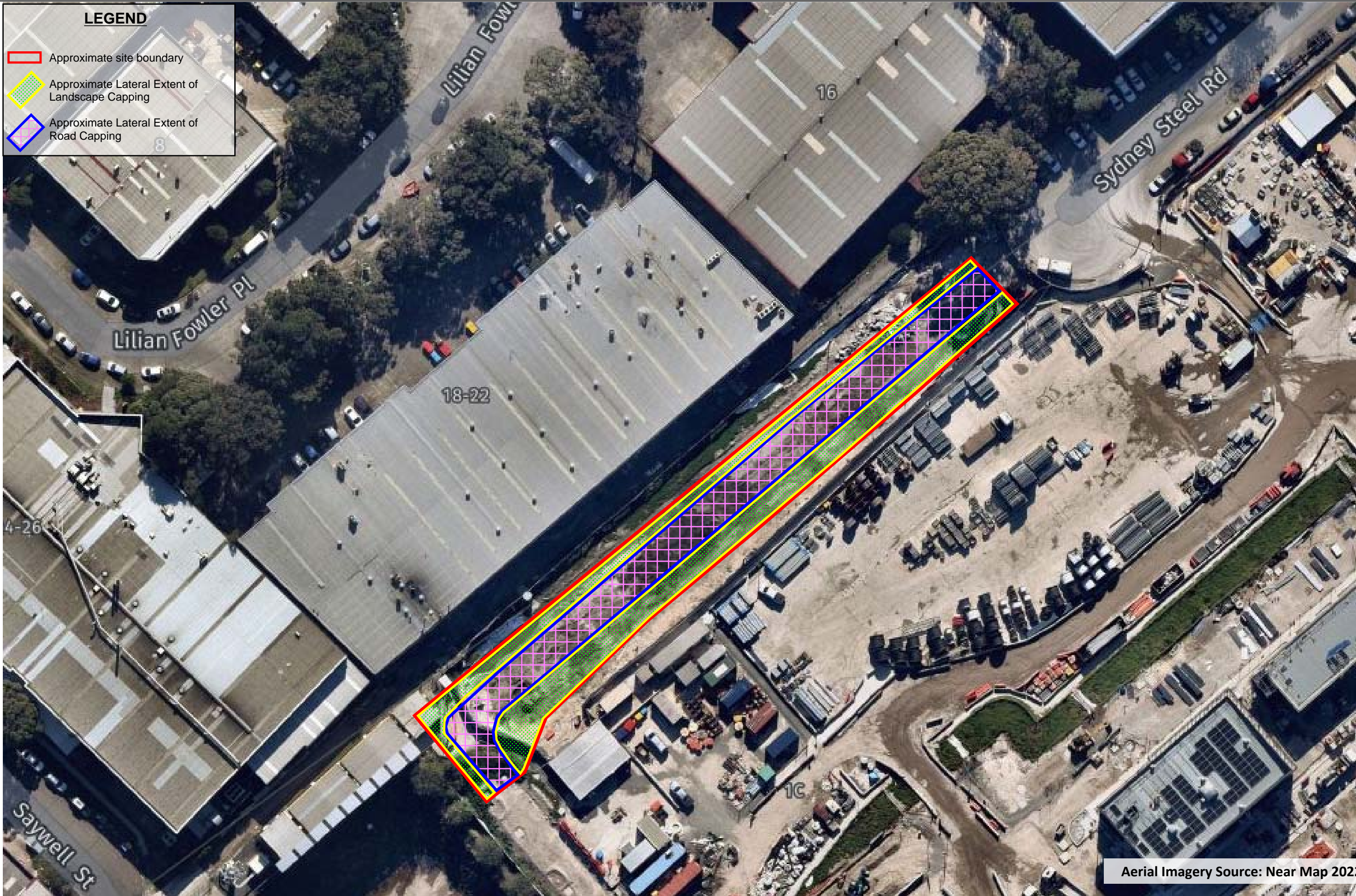


Aerial Imagery Source: Near Map 2022

Scale: 20.00 m

Lateral - Inferred Extent of Remediation



	Client Name:	CPB Contractors PTY Limited & UGL Engineering PTY Limited As Systems Connect Line-wide	Figure Number:	3	
	Project Name:	Environmental Management Plan – Road Infrastructure	Figure Date:	05 October 2023	
	Project Location:	1C Sydney Steel Road, Murrickville	Report Number:	9198.27-ER-3-6	




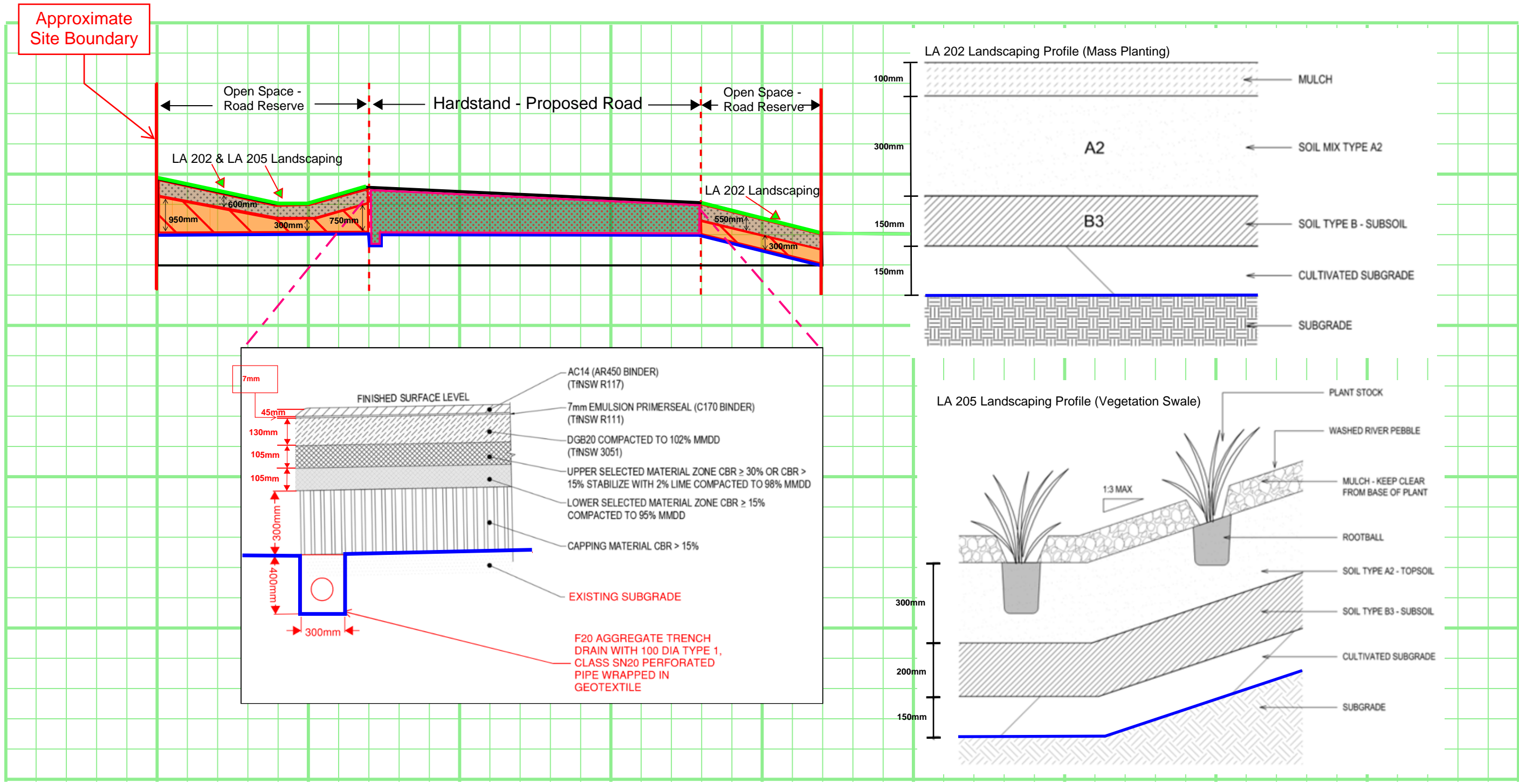
Aerial Imagery Source: Near Map 2022

Scale: ← 20.00 m →

Lateral - Inferred Extent of Capping Layers



	Client Name:	CPB Contractors PTY Limited & UGL Engineering PTY Limited As Systems Connect Line-wide	Figure Number:	4	
	Project Name:	Environmental Management Plan – Road Infrastructure	Figure Date:	05 October 2023	
	Project Location:	1C Sydney Steel Road, Marrickville	Report Number:	9198.27-ER-3-6	

LEGEND
 Marker Layer / Geotextile Fabric



Note: All dimension are in millimetres (mm)

Cross-Sectional View of Capping Layers

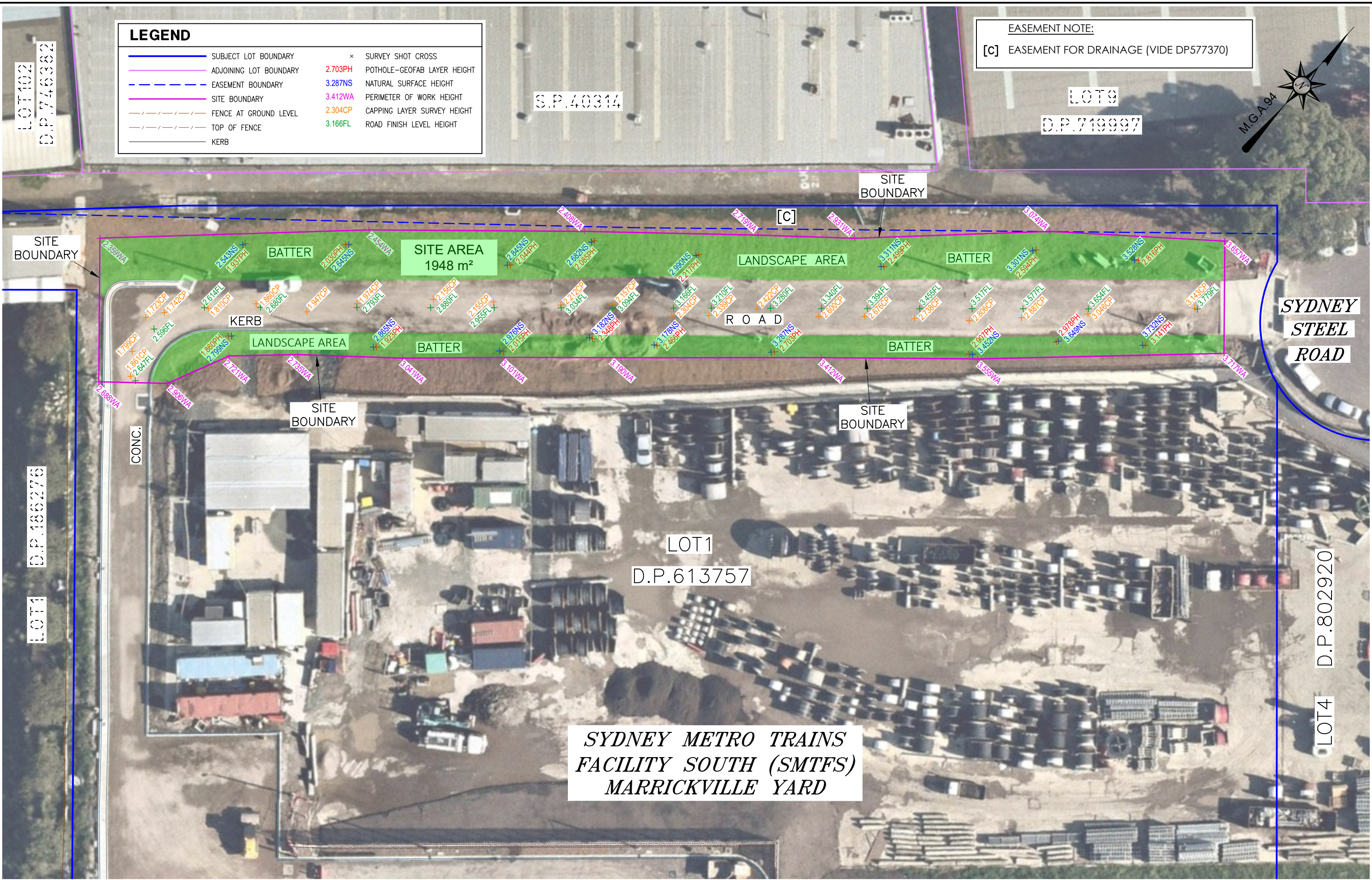
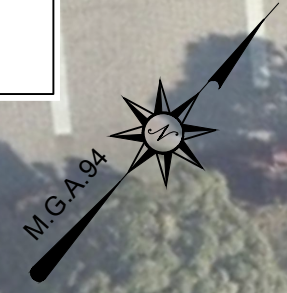
	Client Name:	CPB Contractors PTY Limited & UGL Engineering PTY Limited As Systems Connect Line-wide	Figure Number:	5	
	Project Name:	Environmental Management Plan – Road Infrastructure	Figure Date:	05 October 2023	
	Project Location:	1C Sydney Steel Road, Marrickville	Report Number:	9198.27-ER-3-6	

APPENDIX A – Survey Plan (Public Road and Landscaped Area Capping System)

LEGEND

	SUBJECT LOT BOUNDARY		SURVEY SHOT CROSS
	ADJOINING LOT BOUNDARY	2.703PH	POTHOLE-GEOFAB LAYER HEIGHT
	EASEMENT BOUNDARY	3.287NS	NATURAL SURFACE HEIGHT
	SITE BOUNDARY	3.412WA	PERIMETER OF WORK HEIGHT
	FENCE AT GROUND LEVEL	2.304CP	CAPPING LAYER SURVEY HEIGHT
	TOP OF FENCE	3.166FL	ROAD FINISH LEVEL HEIGHT
	KERB		

EASEMENT NOTE:
 [C] EASEMENT FOR DRAINAGE (VIDE DP577370)



**SYDNEY METRO TRAINS
 FACILITY SOUTH (SMTFS)
 MARRICKVILLE YARD**

	SYSTEMS CONNECT LEVELS 1, 116 MILLER ST, NORTH SYDNEY NSW 2060		HORIZONTAL DATUM: CO-ORDINATE SYSTEM: M.G.A.94 MARKS ADOPTED:		VERTICAL DATUM: DATUM: A.H.D. B.M. ADOPTED: R.L. SOURCE:		PLAN : SHOWING POTHOLING DATA OF ASBESTOS CAPPING AREA FOR, SYDNEY STEEL ROAD , MARRICKVILLE NSW 2204		L.G.A.: INNER WEST SURVEYED DSP MODELLER/DRAWN K.S. CHECKED J.P. APPROVED P.G. SURVEY REFERENCE 35671 SCALE 1:400 DATE 27/06/23		SHEET 1 OF 1 DRAWING NUMBER 35671-SMTFS-STEEL-RD-PHOLE.DWG REV B	
	B	ROAD SURVEY DATA ADDED	27/06/23									
	A	FINAL ISSUE	26/06/23									
	REV.	AMENDMENTS	DATE									

APPENDIX C CORRESPONDENCE

Tom Onus
 NSW EPA Accredited Site Auditor
 Ramboll Australia Pty Ltd.
 Level 3, 100 Pacific Highway
 North Sydney, Sydney, NSW 2060

Re: Environmental Management Plan - Sydney Steel Road (extension),
 Marrickville

10 May 2024

Dear Tom Onus,

Sydney Metro is writing to inform the intent of registering a covenant on title for the Environmental Management Plan (EMP), Attachment 1: *Alliance Environmental Management Plan, Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204* under s.88B of the Conveyancing Act. This covenant will sit within the operational land of the Sydney Metro project, as marked out on the site plan in Figure 1. Acceptance of the EMP for this parcel of land was agreed by the Operator (MTS) 4th April 2024 in Attachment 2: *Letter – MTS Approval of the EMP*.

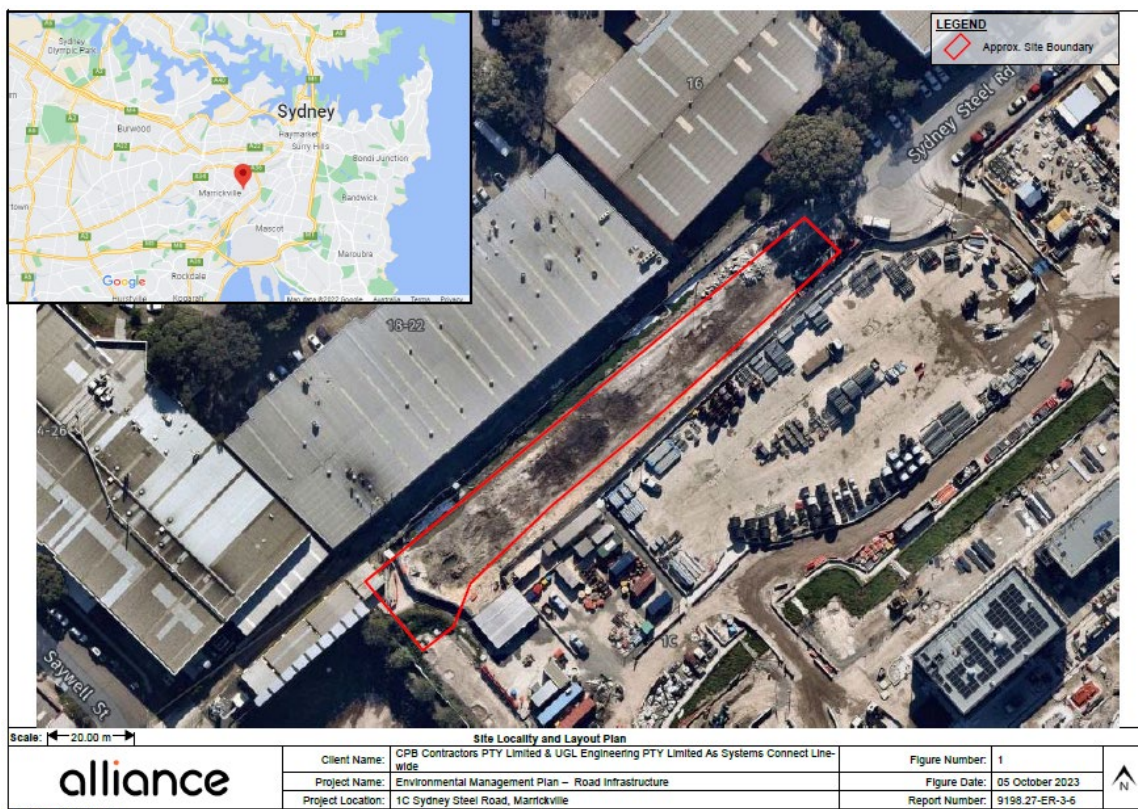


Figure 1: Site Plan

The project is currently commencing a broader subdivision process for the Sydney Steel Road site since its acquisition, which will require appropriate survey to determine new site boundaries and new easements required on site. Sydney Metro will be creating a Development Lot (to be divested) and a Station Lot (to be retained). However, given this process will require consultation with service providers such as Ausgrid and Sydney Water, Local Council and other parties, Sydney Metro anticipates registration of this strata plan and s.88b statement about three months from commencement of the subdivision and survey works.

Therefore, Sydney Metro will, as soon as reasonably possible, cause to be registered on title for the land that is the subject of the EMP, an appropriate dealing which notifies the public of the existence of the EMP and requires the landowner to comply with its terms as stated within the document.

Sydney Metro hopes its intent and timeframes outlined above address the outstanding comment from your email to Systems Connect dated 12 March (*Evidence of the covenant registered on title under s.88B of the Conveyancing Act*), and the approach agreed in a meeting held with Sydney Metro's Environment and Contamination team on 3rd April 2024, to allow for the issue of the Site Audit Report and Site Audit Statement.

Should you have any questions or comments on the subject of the letter or attachments, please do not hesitate to contact me.

Sincerely,



Aidan Rooney
Line-wide Delivery Director
City and Southwest
Sydney Metro



Metro Trains Sydney Pty Ltd
47 Tallawong Road
Tallawong NSW 2762
ABN 54 600 820 737

Date: 04 April 2024

To whom it may concern,

RE: MTS Approval of the EMP

MTS have reviewed the Alliance Geotechnical Pty Ltd Environmental Management Plan: Road Infrastructure, Parcel of Land at 1C Sydney Steel Road, Marrickville NSW 2204, Final version dated 13 March 2024 (the EMP). MTS approve the EMP and confirm that the EMP will be incorporated into the Chatswood-Sydenham Operational Environment Management Plan, required under CSSI 7400 planning approval conditions, and it will be implemented throughout the life of the MTS contract.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'Amanda Calvez', written in a cursive style.

Amanda Calvez
GM Safety, Quality, Risk & Environment

Tom Onus

From: Tom Onus
Sent: Friday, 24 May 2024 2:28 PM
To: info@epa.nsw.gov.au
Cc: McCormick, Tristan; Geoff Fletcher; Joanna Graham
Subject: Recycled Mulch containing engineered wood products and anthropogenic material

Director of Waste Compliance,

I am undertaking a contaminated land audit (TO-105) of a constructed road and associated landscaping area, which extends into a Sydney Metro stabling yard at 1C Sydney Steel Road, Marrickville NSW 2204. I provide the following notification to NSW EPA in accordance with Section 4.3.7 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd edition)*.

My client has provided information noting that recycled mulch was imported to the site in March 2023 from Bingo Industries. A letter included tax invoices and two supporting laboratory certificates from the mulch supplier. The batch testing results provided by the supplier indicate that the material is free from foreign materials and asbestos.

My inspection of the material after placement identified minor quantities of engineered wood products and anthropogenic wastes during a site visit in August 2023. A subsequent investigation of the mulch was undertaken by ADE (9 May 2024) in accordance with the NSW EPA Contaminated Mulch Management Plan (CMMP). The ADE investigation identified minimal foreign material, including MDF, concrete, PVC plastic, brick and glass. ADE concluded that the material is 'Category 2' as specified in the CMMP due to incidental foreign material and was suitable to remain at the site.

The aesthetic impact of these materials is not considered significant, however, the material supplied does not meet the requirements of s5.1.1 of the EPA Mulch Order 2016, i.e. "*the mulch does not contain asbestos, engineered wood products, preservative treated or coated wood residues, or physical contaminants, including but not limited to glass, metal, rigid plastics, flexible plastics, or polystyrene*".

Kind regards

Tom Onus

NSW EPA Accredited Site Auditor

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