SYDNEY METRO - WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

Orchard Hills Station
Remedial Action Plan

Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works

Project number	WSA-200-SBT
Document number	
TTMP Reference	SMWSASBT-CPBG-SWD-SW000-GE-RPT-040522
Revision date	24 November 2022
Revision	A03

Document approval

Rev	Date	Prepared by	Review and Approved by
A01	20/09/2022	[redacted]	[redacted]
A02	2/11/2022	[redacted]	[redacted]
A03	24/11/2022	[redacted]	[redacted]

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Abbreviations

Abbreviation	Definition
ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AEPR	Airports Environment Protection Regulations 1997
AHD	Australian height datum (0 AHD corresponds roughly to mean sea level)
AMP	Asbestos Management Plan
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
ATM	Airport Terminal Station
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, xylene
CEMP	Construction Environment Management Plan
COPC	Chemicals of potential concern
CPBG	CPB Contractors Ghella
DSI	Detailed Site Investigation
ENM	Excavated Natural Material
EPL	Environment Protection License
LOR	Limit of Reporting
mbTOC	Metres below Top of Casing
NSW EPA	Environment Protection Authority of New South Wales
OCP	Organochlorine Pesticides
OPP	Organophosphorous Pesticides
OHS	Orchard Hills Station
PAH	Polycyclic Aromatic Hydrocarbons
PFAS	Per- and poly-fluoroalkyl substances
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
POEO	Protection of the Environment Operations Act 1997
RAP	Remedial Action Plan
SMP	Soil Management Plan
SWMP	Soil and Water Management Plan

Abbreviation	Definition
TBM	Tunnel Boring Machine
TRH	Total Recoverable Hydrocarbons
TTMP	Tetra Tech Major Projects Pty Ltd
VENM	Virgin Excavated Natural Material

1. Introduction

1.1. General

Sydney Metro has engaged the CPB Ghella Joint Venture (CPBG) for the design and construction of the Station Boxes and Tunnelling Works (SBT Works) of the Sydney Metro Western Sydney Airport project (the 'Project').

The SBT Works involves the construction and operation of a new 23km metro rail line from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. The Project includes tunnels and civil structures, including a viaduct, bridges, and surface and open-cut troughs between the two tunnel sections. **Figure 1.1** shows the proposed alignment and key features of the Project.

The SBT Works are divided into two parts:

- SBT North: St Marys Station to Orchard Hills Station. St Marys Station is an existing heritage-listed suburban rail station. The Orchard Hills Station (OHS) ("the site") is a new station for the Sydney Metro line and will include the portal dive structure. The boundaries of the site are shown on Figure 1 in Appendix 1.
- SBT South: Airport business park dive structure to the Western Sydney Airport Aerotropolis station. This section of work is largely greenfield, with construction both on and off-airport land. The Airport Terminal Station (ATM) and Bringelly Services Facility (BSF) are included along the SBT South alignment.

Key elements on the SBT Works include:

- Two sections of twin tunnels with a combined length of approximately 9.8 km, plus associated portal structures. This includes one section from St Marys to Orchard Hills and the other under Western Sydney International (WSI) airport to the new Aerotropolis Station.
- Excavations at either end to enable trains to turn back, and stub tunnels to enable future extensions
- Station box excavations with temporary ground support for four stations at St Marys, Orchard Hills, Airport Terminal and Aerotropolis
- Excavations for two intermediate services facilities, one in each of the tunnel sections at Claremont and Bringelly.

CPBG has engaged Tetra Tech Major Projects Pty Ltd (TTMP) to provide geotechnical, hydrogeological and contaminated land services associated with the design and construction of the SBT Works.

This document describes the RAP for the site and has been prepared to satisfy the requirements of Section 12.20 of the Sydney Metro (2022) Sydney Metro - Western Sydney Airport, Station Boxes and Tunnelling Works Design and Construction Deed (the Deed). The RAP describes the controls which need to be undertaken during construction which are not specifically covered under the following plans prepared by CPBG: Soil and Water Management Sub-Plan; Waste and Recycling Management Sub-Plan; Spoil Management Sub-Plan and Asbestos Management Plan.

The site is subject to a Statutory Site Audit (Audit (TO-095)) by a NSW Environment Protection Authority (EPA) accredited Site Auditor, Tom Onus of Ramboll Australia Pty Ltd, under the NSW Contaminated Land Management Act 1997 (CLM Act).

Figure 1.1 Overview of SBT Works

1.2. Project Details and the Proposed Development Works on Site

1.2.1. Construction

The proposed layout of the OH site during construction is in **Appendix 1**. Construction of the site for the SBT Works includes the following:

Preparatory Works:

- Demolition of existing buildings and removal of septic tanks
- Removal of the AST (22-26 Lansdowne Road).
- Construction of temporary construction work facilities including:
  - Sediment basin
  - Water treatment plant
  - Crane pad and associated hardstands around the station box and portal structure
  - Laydown areas
  - Workshop
  - Offices and car parks
  - Substation
  - Haul and access roads
- Topsoil stripping and site levelling
- Piling

Bulk Excavation, Construction of Permanent Portal Structure and Tunnelling Support Works:

- Portal, station box and dive excavation using rippers and rock hammers
- Construction of cast-in-situ permanent portal structure
- The station box and dive structure is approximately 300 m long, 20 m wide, and 10 m deep (to approximately 27 m AHD). Excavation of the structure will generate approximately 60,000 m^3 of spoil (as in-situ volume) which requires off-site disposal
- TBM assembly, launch and tunnelling support works
- Cross passage construction support.

Construction of the temporary works areas will require clearing and grubbing of vegetation and surface soils. It is intended that soil materials stripped for the construction of the temporary works will be stockpiled within the site for either reuse on-site post construction, or disposal offsite. Materials which cannot be reused on-site will be disposed of off-site.

For the SBT Works the excavation of the station box and dive structure will be drained. The portal structure will be undrained (tanked), and the dive structure will be drained. A decision on whether the station box and dive structure is to be undrained (tanked) is to be made by another contractor in-conjunction with Sydney Metro.

The tunnels and associated cross passages and stub tunnels are to be undrained (tanked).

1.2.2. Dewatering

The Orchard Hills Station excavation is anticipated to extend to 27 m AHD allowing some over-excavation for the preparation of the floor for the casing of the base slab. A ramp to the ground surface will be constructed to the south and will provide construction access and will form part of the metro rail system. On completion, the reference design nominates undrained conditions are to be achieved for the station though the ramp would remain drained.

An ephemeral watercourse is present to the north of the station. This is considered as having little influence on groundwater levels. It is interpreted to act as a zone of groundwater discharge under pre-development conditions.

Based on the parameters outlined in the Hydrogeological Interpretative Report (HIR)[1] the sustained seepage to the station excavation and dive structure is assessed as 15 m^3/d (0.17 L/s) and the lateral extent of the drawdown impact is assessed to be within 350 m of the station. This zone of influence does not extend as far as South Creek to the east so no adverse impacts on South Creek are predicted. No existing groundwater bores have been identified within the assessed zone of influence.

Drawdown related settlement is assessed to be less than 5 mm (allowing a drained modulus of 35 MPa and a Poisson's Ratio of 0.3 for depressurisation of up to 5 m of residual soil).

Should the station be drained during operation the extent of the impact is as described above. Groundwater ingress to the drained station would need to be addressed possibly involving treatment and release to the surface water system. This would increase the requirements of the system which would otherwise need to deal with the seepage to the drained dive structure.

Construction of the station box and portal dive will require temporary dewatering during construction. An assessment of potential groundwater inflow during construction was reported in the HIR.

1.2.3. Re use of Excavated Material within the larger Airport Site

A large part of the larger Western Sydney Airport site is proposed to be filled by up to 8 m (designated the 'FS01 site'). All excavated material from this site which is assessed as suitable is intended to be utilised as fill at the FS01 Site.

CPBG will need to ensure relevant regulatory requirements (e.g., Protection of the Environment Operations (Waste) Regulation 2014 and Protection of the Environment Operations Act 1997) and / or the Federal Material Import and Reuse Procedures are complied with.

Material which cannot be re-used will be disposed off-site as waste.

1.3. Requirements of the Deed

The RAP has been prepared to address the requirements of the Deed where applicable to this site. Table 1 has been included in this document to summarise items in the Deed which are considered applicable to this site, and where the information has been included in the RAP.

This RAP is specific to the station box and portal dive and surface construction activities at the site (refer to Section 1.2).

[1] Tetra Tech Major Projects (2022a) *Hydrogeological Report (Project-wide)*, SMWSASBT-CPG-SWD-SW000-GE-RPT-040403, 5 July 2022.

Table 1: Requirements of the Deed

Deed Item			Included in RAP	Report Reference
(a)	The SBT Contractor must prepare and submit to the Principal's Representative and the Independent Certifier a Remediation Action Plan in respect of each Detailed Site Investigation performed in accordance with clause 12.19 prior to commencing any excavation activities (except in relation to Preliminary Works).		✓	This document
(b)	Except in relation to the Remediation Action Plan in respect of Orchard Hills East Station, the SBT Contractor may not submit a Remediation Action Plan under this clause unless and until the Detailed Site Investigation report for the relevant area has been submitted to the Principal's Representative and has not been the subject of a notice under clause 12.19(f)(ii) within the time period specified in clause 12.19(f)(ii) (or clause 12.19(g)) as applicable.		✓	This document
(c)	Each Remediation Action Plan must:			
	(i)	describe the nature and extent of Contamination based on the Detailed Site Investigation, the Information Documents and any other relevant information which is necessary to characterise the risk to the construction, operation and maintenance of Sydney Metro - Western Sydney Airport;	✓	Section 3
	(ii)	describe the manner in which the SBT Contractor will Remediate Contamination within the proposed areas of excavation and/or disturbance;	Note 1	Note 1
	(iii)	include a detailed risk assessment to determine and describe the requirements for Remediation of Contamination of land (including soil, groundwater, ground gas and vapour) within the Construction Site or Extra Land surrounding the areas of proposed excavation or disturbance with respect to potential exposure scenarios, including but not limited to migration of Contamination via groundwater, ground gas and odour into the areas of excavation or disturbance;	Note 1	Note 1
	(iv)	present a preferred Remediation option based on:		
		(A) whole-of-life costs;	Note 1	Note 1
		(B) to the extent practicable, maintaining the Overall D&C Program;	Note 1	Note 1
		(C) benefits (as far as is practicable based on available infrastructure design information); and	Note 1	Note 1
		(D) compliance with this deed;	Note 1	Note 1
	(v)	define what will constitute Remediation Practical Completion of the Remediation;	Note 1	Note 1
	(vi)	be prepared in accordance with Law, Approvals, applicable Codes and Standards, the lawful requirement of any Authority, Good Industry Practice, all guidelines made or approved by the EPA, the National Remediation Framework, the Human Health and Environment Risk Assessment and any other requirements of this deed;	✓	Section 1.4

Deed Item			Included in RAP	Report Reference
	(vii)	be reviewed and approved by a Certified Contaminated Land Consultant;	✓	Front Page
	(viii)	be reviewed and endorsed by an Accredited Site Auditor;	✓	Section 1
	(ix)	be accompanied by an Interim Site Audit Advice prepared by the Accredited Site Auditor when submitted to the Principal's Representative and the Independent Certifier in accordance with clause 1.1(a);	✓	(To accompany the RAP)
	(x)	include details of any Remediation completed during the performance of any Preliminary Works; and	Note 1	Note 1
	(xi)	consider and plan to mitigate the migration of Contamination from the Construction Site.	Note 1	Note 1
(d)	In addition to the requirements set out in clause 1.1(c) and without limiting clause 12.20(j), each Remediation Action Plan must contain sufficient detail and justification to enable the determination of any Agreed Remediation Scope, including:			
	(i)	an ACC Classification and Excavation Map, being a detailed map or maps, drawn to a practical scale of the relevant area the subject of a Remediation Action Plan that accurately identifies:	✓	Note 2
		(A) the location of any samples that have been taken by and/or made available to the SBT Contractor, including the Detailed Site Investigation samples or any relevant information provided to the SBT Contractor in the Information Documents; and	✓	Section 3 Appendix 1 Appendix 2
		(B) a detailed mapping of remaining Solid Waste and its respective waste classification in accordance with the Waste Classification Guidelines and the relevant provisions of the POEO Act including resource recovery exemptions and orders across the relevant area the subject of a Remediation Action Plan, based on the relevant Detailed Site Investigations and clearly detailing the extent of lateral and vertical classification of Waste within each area the subject of a Remediation Action Plan;	✓	Note 2
	(ii)	a detailed excavation plan that is consistent with the ACC Classification and Excavation Map prepared under clause 1.1(d)(i) describing the quantities in tonnes and cubic metres of each material, including a register in estimated tonnes and cubic metres of each waste classification of Solid Waste, proposed to be excavated and to be reused and/or disposed offsite (ACC Excavation Quantity Register);	✓	Note 2
	(iii)	details of any other elements of Remediation that are required to mitigate risks to the construction, operation and maintenance of Sydney Metro - Western Sydney Airport including, but not limited to infrastructure design requirements, treatment of Contamination, capping and containment; and	Note 1	Note 1
	(iv)	precise details of how the validation of Remediation will be achieved and demonstrated.	Note 3	Section 6

Notes:

1) Contamination has not been identified on the Site which Works which triggers the requirement for remediation.
2) Plans which show waste classification of materials have been provided in TTMP (2022) Material Classification Assessment: Orchard Hills Station Box. SMWSASBT-CPG-SWD-SW000-GE-RPT-040533. 12 October 2022.
3) Validation refers to validation of construction activities completed.

1.4. Regulatory Framework and Guidance

This RAP was prepared in general accordance with the following legislation, industry standards, codes of practice, and guidance documents, where relevant:

- *Contaminated Land Management Act, 1997*
- CRC Care Technical Report No. 10, *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, 2011* (CRCCARE 2011)
- Heads of EPAs Australia and New Zealand. *PFAS National Environmental Management Plan. Version 2.0 – January 2020*
- *Protection of the Environment Operations (POEO) Act 1997* (POEO Act 1997)
- *National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999* (April 2013) (ASC NEPM 2013)
- NSW EPA (2014) *Waste Classification Guidelines Part 1: Classifying waste*
- NSW EPA (2016) *Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste*
- NSW EPA (2020), *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land, 2020*.

1.5. Previous Reports

The following previous reports were referred to in preparing this RAP:

- *TTMP (2022a) Hydrogeological Report (Project-wide), SMWSASBT-CPBG-SWD-SW000-GE-RPT-040403, 5 July 2022. (the 'HIR report')*
- *TTMP (2022b); Western Sydney Airport Station Boxes and Tunnels Tender, Orchard Hills Station Detailed Site Investigation (Ref: SMWSASBT-CPBG-SWD-SW000-GE-RPT-040514; Rev. A04, dated 15 September 2022). ('the DSI report')*
- *TTMP (2022c); Detailed Site Investigation - Addendum Orchard Hills Groundwater Monitoring Data* (Ref.: SMWSASBT-CPBG-SWD-SW000-GE-RPT-040517)
- *TTMP (2022d) Material Classification Assessment: Orchard Hills Station Box. SMWSASBT-CPG-SWD-SW000-GE-RPT-040533. 12 October 2022*
- *CPBG (2022a); Asbestos Management Plan (AMP), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works, Rev A, dated 2 February 2022*
- *CPBG (2022b); Construction Environment Management Plan (CEMP), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works, Preparatory Works, Rev 2 dated 13 April 2022*

- *CPBG (2022c) NSW (Off-Airport) Soil and Water Management Sub Plan (SWMP), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works, Rev A* dated 19 May 2022

1.6. Excavation, Remediation and Validation Requirements

The conditions of approval for the project include E92 and E93 in relation to soils and contamination. Condition E92 requires the completion of a Detailed Site Investigation (DSI) report to 'determine the full nature and extent of the contamination'. Condition E93 requires the preparation of a RAP if remediation is required to make the site suitable for its intended land use.

TTMP (2022c) completed a DSI report to address Condition E92 which concluded the site was 'considered suitable for the proposed development (commercial / industrial land use)' based on the following:

- Soil materials from beneath former structures, waste storage areas, areas of fill etc. will be excavated and removed to facilitate construction of the site;
- The site will be metro station covered in hard landscaping with minimal soft landscaping; and
- The station box and portal dive are undrained (tanked) structures.

On this basis, it was determined that a RAP was not required to address Condition E93. However, a RAP has been prepared to outline the requirements for spoil management and soil validation (if required) associated with the implementation of the proposed development.

1.7. Objectives of the document

This objectives of this RAP is to outline the requirements for spoil management and soil validation. This RAP refers to other documents prepared by CPBG and TTMP, where relevant. Together, these documents outline how the project will be managed to ensure an integrated approach to meeting contractual and legal requirements, whilst rendering the site suitable for the proposed development, from a contamination perspective.

2. Site Information

2.1. Site Setting and Features

The site is located on the corner of the eastern side of Kent Road and is bound to the north by the M4 Motorway and to south by properties located on the southern side of Lansdowne Road, as shown in Figure 1 in Appendix 1.

The site is currently comprised of rural-residential properties. Key attributes of the site are summarised in Table 2. The site is defined as the 'OHS Site Boundary' as shown by the yellow dashed line in Figure 1.

Table 2: Site Key Attributes

<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td>Address</td><td>52-56 Kent Road, 58-62 Kent Road, 64 Kent Road, 70-74 Kent Road, 76-80 Kent Road, 82-86 Kent Road, 88-92 Kent Road, 94-98 Kent Road, 100-104 Kent Road, 106-112 Kent Road, 114-122 Kent Road, 17-25 Lansdowne Road, 22-26 Lansdowne Road, 28-32 Lansdowne Road, 34-38 Lansdowne Road.

Portions of Kent Road and Lansdowne Road are also within the site.</td></tr>
<tr><td>Property Area</td><td>Approximately 25.6 Ha.</td></tr>
<tr><td>Title Identification Details</td><td>The site comprises:
<table>
<tr><th>Lot/Section/Plan</th><th>Extent of Lot within the Site</th></tr>
<tr><td>1//DP576160</td><td>Full</td></tr>
<tr><td>10//DP1195473</td><td>Full</td></tr>
<tr><td>104//DP128821</td><td>Full</td></tr>
<tr><td>43//DP29388</td><td>Full</td></tr>
<tr><td>44//DP29388</td><td>Full</td></tr>
<tr><td>45//DP29388</td><td>Portion</td></tr>
<tr><td>46//DP29388</td><td>Portion</td></tr>
<tr><td>47//DP29388</td><td>Portion</td></tr>
<tr><td>48//DP29388</td><td>Portion</td></tr>
<tr><td>49//DP29388</td><td>Full</td></tr>
<tr><td>50//DP29388</td><td>Full</td></tr>
<tr><td>81//DP29388</td><td>Full</td></tr>
<tr><td>82//DP29388</td><td>Portion</td></tr>
<tr><td>83//DP29388</td><td>Portion</td></tr>
<tr><td>97//DP29388</td><td>Full</td></tr>
</table>
Portions of Kent Road and Lansdowne Road within the site do not have a registered title.</td></tr>
<tr><td>Current Land Use</td><td>Mixture of residential and agricultural uses</td></tr>
<tr><td>Current Land Zoning</td><td>The site is currently zoned RU4 (Primary Production Small Lots) under the Penrith City Council Local Environmental Plan 2010</td></tr>
<tr><td>Adjoining Land Uses</td><td>North: Western Motorway with residential dwellings of Claremont Meadows beyond

South: Rural residential properties and an unnamed tributary of Blaxland Creek

West: Rural residential properties and some market garden/small scale agricultural land uses.

East: Rural residential properties with some open land/small scale agricultural land uses.</td></tr>
</table>

2.2. Site Description

A detailed description of the site was provided within the DSI Report (TTMP, 2022b). The following observations apply generally to the site:

- The site comprised of a number of rural-residential properties.
- The site generally sloped slightly down to the south and east.
- Access within buildings and structures was generally restricted and the site walkover generally did not extend to areas where long grass was present for safety reasons, noting that the long grass restricted observations which could be made.
- Suspected asbestos-containing building materials largely in the form of fibre cement sheeting were suspected of being present within numerous structures (mainly houses) at the site.
- The majority of the properties appeared to have septic systems.

The following provides a summary of the observations made at each property.

Lot 10 DP1195473 (52-56 Kent Road)

- There was a small residential house constructed of brick and weatherboard present in the western portion of the property. A large shed, constructed largely of corrugated metal was present immediately north of the house. What appeared to be an ad-hoc apartment had been constructed within the shed, which was inaccessible at the time of the site walkover.
- East of the house and shed, the remainder of the site was comprised of grass.
- The EIS indicated an above ground storage tank (AST) may be present at the property, however no indication of an AST was identified during the walkover.
- A circular area comprised of compacted fill soil was present approximately 60m west of the dam situated in the eastern portion of the property.

Lot 1 DP576160 (58-62 Kent Road)

- Two, single level, residential houses were present on the western part of the property with the yards of each house separated by a 1m high chain-link fence.
  - The northern house appeared to be older and appeared to be constructed of weatherboard.
  - The southern house was constructed of brick.
- Lawn was present at the front (western) side of the property
- The eastern portion of the property was covered in grass/pasture.
- Minor quantities of anthropogenic materials were present to the west and south of the large dam situated in the eastern portion of the property. These materials largely included discarded metal and timber.

Lot 104 DP128821 (64 Kent Road)

- A large, two-storey house was situated in the western portion of the property and was surrounding by lawn/turf.
- A paved driveway accessing Kent Road was present in the south-western corner of the property and wrapped around to a large hard stand area on the south side of the house. Portions of the hardstand area were used for ad-hoc storage of tools and equipment.

- A 200L metal drum was situated on the lawn on the south side of the house and had been used as a fire pit for burning materials (partially burnt paper and metal could be seen within the drum).
- The remainder of the site appeared to be used for pasture.

Lot 43 DP29388 (70-74 Kent Road)

- Vacant, undeveloped plot.
- The majority of this property was covered by tall grass, and trees. No evidence of contamination was identified, although the walkover was restricted to making observations from the grassed strip to the north that ran parallel to the property due to the dense vegetation.

Lot 44 DP29388 (76-80 Kent Road)

- A house, constructed of brick was situated on the western extent of the property.
- To the south-east, a large workshop, constructed of corrugated metal was present, which appeared to be used for storage and as a garage. Some minor staining was noted on the floor of the workshop however the hardstand appeared to be in good condition.
- What appeared to be a septic system was present between the house and workshop.
- A water cart, possibly for application of fertilizers or herbicides/pesticides was stored on the grass on the north side of the workshop. Several empty chemical containers of unknown contents were stored in the vicinity.
- The remainder of the site was characterised by grass/pasture.
- A dam was present in the eastern extent of the property. An intermediate bulk container (IBC), which appeared to be empty was situated on the western side of the dam.

Lot 45 DP29388 (82-86 Kent Road)

- A large house of brick construction was situated in the south-western corner of the property.
- A septic system was situated on the western side of the house.
- Further east and on the southern boundary of the site, two garden sheds and a workshop and carport were present.
- A long, narrow rectangular concrete pad was present along the northern boundary of the site.
- The eastern portion of the property was undeveloped and covered by grass and spare, mature trees.

Lot 46 DP29388 (88-92 Kent Road)

- A house, constructed of brick was situated in the western portion of the property. A garage, with sealed hard stand situated beneath the house was used for storage.
- A septic system was situated on the eastern side of the house.
- The remainder of the western half of the property was undeveloped and characterised by grass, with some large bramble thickets present; due to the dense vegetation cover in these areas, it could not be discerned if fill mounds were present beneath the vegetative cover.
- The eastern half of the property was characterised by dense vegetation and tree cover.

Lot 47 DP29388 (94-98 Kent Road)

- A two-storey house of brick construction was situated on in the south-western portion of the property.
- A large shed (presumably for livestock) constructed with corrugated metal and no flooring was present in western central portion of the site.

  - A small concrete pad with a cut-off metal pipe was present on the south side of the shed, which could potentially be associated with fuel storage.
  - Fibre cement debris with an approximate footprint of 1m^2 and suspected of containing asbestos was present in the central-eastern portion of the shed.
  - Disused metal cans including old fuel drums were present on the bare ground.
  - Discarded electronics equipment was present on the ground within the shed.
  - The structure was considered unsafe to re-renter during DSI fieldworks, as such no additional sampling had been undertaken at the time this report was prepared.

  The EIS has reported the shed to be a potential cattle dip site. No signs of a cattle dip were observed.

- Two well covers (presumably installed for groundwater and soil vapour monitoring) were observed on the eastern exterior side of the shed.
- A small shed constructed of corrugated metal was present along the southern boundary of the property.
- The remaining eastern half of the property was characterised by a dense stand of trees.

Lot 48 DP29388 (100-104 Kent Road)

- A single-storey weatherboard house was situated in the south-western corner of the property.
- A large workshop was situated immediately to the north with internal, sealed hardstand within and a large, paved area/driveway around the front of the building. The hard stand within the workshop appeared to be in good condition with only minor staining present.
- Pipework was observed on the exterior, eastern wall leading to a 200L metal drum. The pipework leading to the drum appeared to be connected to an air-conditioning unit within the workshop.
- No infrastructure indicative of the presence of fuel tanks or oil separators were observed.
- A groundwater monitoring well was present approximately 10m to the east of the workshop, with a second groundwater monitoring well (assumed to be groundwater) observed near the southern boundary (south-east of the workshop). This second well was situated next to a vertical PVC pipe extending out from the ground, approximately 50 mm in diameter that had been cut off approximately 30cm above ground level.
- Evidence of filling was present on the eastern side of the workshop, likely to create a level area.
- The central portion of the property was characterised by dense grass growth, with eastern third of the site characterised by vegetation/trees.
- A dam was present at the eastern extent of the site, several soil mounds were present along the southern and eastern sides of the dam. The soil mounds appeared to be part of a motocross track.
- Anthropogenic materials in the form of discarded metal, plastic and concrete roofing tiles were observed to the south of the dam.

Lot 49 DP29388 (106-112 Kent Road)

- A single-storey brick house was present in the north-west corner of the property, accessed via a gated driveway off Kent Road near the north-west corner of the property and was constructed of interlocking brick.
- A detached, multi-car garage, constructed of corrugated metal was situated immediately north of the house, on the northern side of the driveway.

- To the east of the garage was a large workshop/shed[2], also constructed of corrugated metal.
- A second driveway, constructed of gravel, access the property from Kent Road at the northern extent of the property and extended to the centre of the property.
- The front and rear of the house was covered by lawn.
- The perimeter of the property was fenced.
- The eastern half of the property was characterised by grass/pasture and mature trees.
- Vegetation was noted to be present sporadically in the south-west and southern portion of the property.
- A large fill mound estimated to be approximately 25m x 2m x 1.5m was observed parallel to the northern property boundary.

Lot 50 DP29388 (114-122 Kent Road)

- A single-storey residential house constructed of weatherboard was present in the north-western portion of the property and was accessed from Kent Road via a gravel driveway.
- An 1m high fence appeared to surround the property.
- The western portion of the property was charactered by lawn, with taller grass / weeds present east of the house.
- A stockpile of anthropogenic material approximately 10m in size and consisting of plastic, metal, carpet and plasterboard was observed in the north-eastern section of the property. No suspected Asbestos Containing Material (ACM) was observed within the stockpile.
- The southern half of the property had a small house situated in the south-west corner, constructed of fibre cement sheeting suspected of containing asbestos.
- A groundwater monitoring well was present at the north-east corner of the intersection of Kent Road and Lansdowne Road.
- A small shed constructed of corrugated metal was situated north-east of the house.
- The remainder of the property was characterised by grass or pasture, with a large dam situated at the eastern extent.

Lot 97 DP29388 (17-25 Lansdowne Road)

- A single storey brick house was situated in the south-eastern portion of the property.
- A large dam was present in the south-west corner.
- Two large, metal sheds with bay doors were present along the eastern boundary.
- A small external office was situated in the central-southern portion of the property.
- Stored materials include suspected asbestos-containing fibre cement (stored within a small skip bin) were present along the eastern boundary near the north-east corner of the property.
- A small fill mound was present in the north-east corner – comprised of cement pavers and possibly site won material and appeared to form a ramp.
- The remainder of the site was characterised by grass/pasture.

Lot 83 DP29388 (22-26 Lansdowne Road)

Access to this property was not permitted for the DSI fieldworks until 28 July 2022; the following observations were made as part of the SAQP site walkover.

- A small house was present in the north-west corner of the property.

[2] It is understood that this workshop has since been demolished.

- A small AST was present on the grass (with no frame/cradle) between two small, corrugated metal sheds situated along the western boundary. The AST appeared to be empty.
- A large shed was present in the western-central portion of the site.
- The driveway and area just south and east of the large shed where characterised by a gravel surface.
- The area to the south of the shed was used for storage, with three, 40-foot shipping containers present with other equipment stored there.
- A small stockpile was present south-west of the large shed; the material comprising the stockpile appeared to be consistent with the driveway material.
- Two large metal drums were also present against the southern wall of the shed.
- A small soil stockpile overgrown with weeds was present in the south-western portion of the property.
- A disused caravan and some other stored materials (including wooden pallets) were present along the southern boundary of the property.
- The remainder of the property was characterised by grass/pasture.

Lot 82 DP29388 (28-32 Lansdowne Road)

- A house was present in the north-western corner of the property.
- The driveway led to the northern central portion of the property with a turnaround area. The turn-around area also appeared to be used of storage of ad-hoc materials including several disused metal 200L drums and building materials
- A groundwater monitoring well was present near the eastern property boundary in the central portion of the site.
- The remainder of the property was characterised by grass/pasture.

Lot 81 DP29388 (34-38 Lansdowne Road)

- A house was present in the north-western corner of the property.
- South of the house, a number of sheds were present.
- On the southern side of the shed, a number of intermediate bulk containers (IBC) were observed, with smaller drums and containers also identified (contents unknown).
- A large dam was present in the southern portion of the property.
- The remainder of the property was characterised by grass/pasture.

Three large sheds were situated south of the dwelling, the concrete pads were inspected following removal of the walls and roof and were found to be in good, clean condition.

2.3. Environmental Site Setting

Table 3 presents a summary of the environmental setting of the site.

Table 3: Environmental Site Setting

Aspect	Description
Topography	Topographic map of NSW available through SixMaps[3] indicates the site is situated at elevations ranging between 46m and 34m Australian Height Datum (AHD) and generally slopes down to the south and east towards Blaxland Creek[4] and South Creek.
Surface Water	Dams are present on a number of the properties which comprised the site. The dams are assumed to support the various surrounding agricultural land uses. Reticulated potable water appears to be present for residential properties within/adjoining the site although these dams may also serve as a secondary source of water for domestic uses. Figure 1 shows the orientation of ephemeral tributaries of Blaxland Creek that passes through and slightly beyond the southern part of the site. The confluence of these tributaries and Blaxland Creek is approximately 400 m southeast of the site.
Geology	A review of the Penrith 1:100 000 scale geology map[5] indicates that the site is underlain by Bringelly Shale of the Wianamatta Group which was deposited in a deep marine environment of the Middle Triassic. The Bringelly shale is described as shale, carbonaceous claystone, laminite, lithic sandstone, with rare coal. Section 3.2.1 provides further detail on the subsurface conditions encountered during the DSI (TTMP, 2022b).
Hydrogeology	Groundwater at the site has been measured at depths ranging from 54 m to 32.4 m AHD within Siltstone and Sandstone Units (the Bringelly Shale, a confined lower aquifer system) and alluvium (an unconfined upper aquifer system). Groundwater follows the topography, resulting in an easterly/south-easterly groundwater flow direction towards Blaxland and South Creeks. (TTMP, 2022a).
Salinity	The NSW Government Office of Environment and Heritage (OEH) have prepared a map which depicts the distribution and potential severity of dryland salinity within Western Sydney based on biophysical factors that are known to cause dryland salinity. A review of the map indicates that the majority of the site is mapped as having moderate salinity with a small portion of the southern part of the site mapped as having high salinity.
Acid Sulfate Soils	The Atlas of Australian Acid Sulfate Soil (ASS) compiled by CSIRO[6] was reviewed to assess the probability of occurrence of ASS within the site. The ASS risk plan indicates that the site is located in an area with Extremely Low Probability of Occurrence of ASS.

3. Summary of Contamination Conditions

3.1. Summary of Previous Investigation Findings

The following reports describe investigations completed within the site:

- Cardno (Nov, 2021); *Contamination Assessment Report – Phase D/E, Sydney Metro Western Sydney Airport* (Ref: 80021888; RevB, dated 26th November 2021)

[3] https://maps.six.nsw.gov.au/
[4] Blaxland Creek is a tributary of South Creek
[5] Geological Survey of Penrith 1991. Surface geology of New South Wales - 1:1 100 000 map. Geological Survey of New South Wales, NSW Department of Primary Industries, Maitland, Australia
[6] http://www.asris.csiro.au/

- Cardno (May, 2021); *Contamination Assessment Report, Sydney Metro Western Sydney Airport* (Ref: 80021888; dated 5th May 2021)
- Golder & Douglas Partners (Feb 2021); *Factual Contamination Report – Preliminary Site Investigation* (Ref: 19122621-003-R-Rev3; Rev3; dated 19th February 2021).
- Golder & Douglas Partners (March 2021); *Geotechnical Data Report* – (Ref: 19122621-002-R-Rev4; Rev4; dated 5th March 2021).
- TTMP (2022b); Western Sydney Airport Station Boxes and Tunnels Tender, Orchard Hills Station Detailed Site Investigation (Ref: SMWSASBT-CPG-SWD-SW000-GE-RPT-040514; Rev. A05, dated 26 September 2022).
- TTMP (2022c); Detailed Site Investigation - Addendum Orchard Hills Groundwater Monitoring Data (Ref: SMWSASBT-CPBG-SWD-SW000-GE-RPT-040517; Rev. A02, dated 24 November 2022).

Figures 2A to 2C illustrates the position of the investigation locations on the site.

The following sections provide a summary of the previous investigations.

3.2. Ground Conditions

The ground conditions encountered with the site generally comprised topsoil extending to depths ranging from 0.1 m and 0.35 m comprised of clay, silty clay and sandy clay topsoil / fill with roots and was generally very damp or saturated. Topsoil was underlain by natural clay, silty clay and silt to depths ranging between 4.2 m and 8.8 m, overlying siltstone, sandstone, interlaminated siltstone and sandstone.

Fill materials were typically not encountered within the site. Where present, such materials were typically consistent with reworked natural materials. This shallow lithology is considered consistent with the rural residential land use of the site where extensive land filling is unlikely to have occurred.

An exception to this was in the vicinity of AEC 25 (as designated in the EIS). The description of the fill materials was similar to natural ground deposits in the area however anthropogenic materials observed including ash, glass, tile and brick. The thickness of fill materials was approximately 0.3 to 0.5 m in this area.

While suspected ACM was observed on the soil surface within the shed at 94 – 98 Kent Road, visual / olfactory signs of suspected contamination and ACM were generally not observed within the soil profile during the intrusive investigation works.

Soil headspace readings were less than 5 ppm which was considered indicative that there is a low likelihood that significant concentrations of volatile organic compounds were present in the soil.

3.3. Groundwater Observations

Groundwater levels ranged between 1. 8 m below top of casing (mBTOC) at SBT-GW-4042 and 5.9 mBTOC at BH-A372.

Groundwater in the southern portion of the site is expected to discharge into Blaxland Creek, which flows through the southern portion of the site. Regional groundwater flows in an east-southeast direction towards South Creek.

Electrical conductivity ranged from fresh to brackish water. Variations in conductivity are potentially attributed to freshwater recharge (i.e. in response to rain) and/or leakage from water pipes.

No odours were observed in the groundwater samples collected.

3.4. DSI Results

The soil and groundwater analytical results from the investigations are presented in summary tables in Appendix 2. The following sections presents a summary of these results in the context of the proposed commercial/industrial use of the site.

3.4.1. Soil

With the exception of concentrations of Benzene in sample SBT-BH-1336, concentrations of CoPC in samples were less than the adopted human health criteria.

The concentrations of benzene were identified in sample SBT-BH-1336 0-0.1 m (4.8 mg/kg) collected in May 2022 that marginally exceeded the commercial/industrial HSL for sandy soils (3 mg/kg). TRH/BTEX were not detected in the sample SBT-BH-1336_ 0.5-0.6 m bgs indicating the impact did not extend significantly in a vertical direction.

Confirmatory sampling at the detection location and in the vicinity of SBT-BH-1336 was undertaken on the 12 August 2022 including resampling from this location and an additional10 samples, stepped out at locations surrounding the initial detection. TRH/BTEXN, VOC/SVOC analytes were not detected in the additional samples analysed. No visual/olfactory signs of contamination were observed. The DSI concluded that the additional data indicated that the Benzene detected at SBT-BH-1336 0-0.1 m in May 2022 was localised and unlikely to pose an unacceptable health risk.

TTMP also noted that concentrations of OPP's (Diazinon, Methyl parathion and Mevinphos (Phosdrin)) were reported at concentrations marginally above the laboratory LOR in sample SBT-BH-1291_0.1-0.2. The concentrations of diazinon (0.4 mg/kg), and methyl parathion (0.4mg/kg) were considerably less than the adopted guidelines. While the US EPA does not criteria for Mevinphos, the DSI noted that the concentrations of 1.1 mg/kg only marginally exceed the LOR of 0.2mg/kg. As Mevinphos was not detected in other samples, it was assessed that the impact was localised and unlikely to pose a significant risk to human health in the context of the proposed use of the site.

Concentrations of Endrin Aldehyde (0.13 mg/kg) sample QC55-DW-19052022 (primary sample SBT-BH-1307) were identified for which no NEPM or US EPA criteria exist. As such, reference was made to the laboratory LOR of 0.05 mg/kg in the absence of criteria and noted that the concentration of Endrin Aldehyde marginally exceeded the level of detection.

Asbestos was not identified at concentrations exceeding the laboratory limit of reporting of 0.1g/kg or by trace analysis in any of the soil samples that were analysed.

A positive detection of asbestos (chrysotile as asbestos fines / fibrous asbestos) was reported in SBT-BH-1295_0.10-0.2. No fill and/or visual signs of ACM was observed at this location in soil material. SBT-BH-1295 is located immediately adjacent to a house which is to be removed as part of Preparatory Works.

3.4.2. Groundwater

Dissolved phase metals including lead, nickel and zinc were detected in samples collected by TTMP during the recent groundwater monitoring event at concentrations exceeding the Freshwater

guideline values. In general, the reported concentrations were within the range of concentrations reported in samples collected in previous investigations.

Elevated concentration of nickel and zinc have previously been observed in groundwater samples from the following locations:

- North of OHE site: SMGW-BH-A113
- Southern portion of OHE site: SMGW-BH-A117 and SMGW-BH-A117S, SMGW-BH-A315, SMGW-BH-A315S
- Central portion of OHE site: SMGW-BH-A310S, SMGW-BH-A311.

Metals in groundwater were considered likely to be attributed to a combination of natural and diffuse urban sources in the area.

Hydrocarbons in the F2 (C10-C16) and/or F3 (C16-C34) fractions were reported in groundwater samples from SBT-BH-A372 and were not detected in SBT-BH-A372s. TTMP note that hydrocarbons detected may derive from naturally occurring hydrocarbons within shale bedrock and/or organic matter present within the samples submitted for analysis (noting these samples were not filtered in the field). The laboratory has advised from a review of the chromatograms that the hydrocarbon detected is potentially carboxylic acid and acetophenone. Both compounds occur naturally. The VOC caprolactam was also reported. Caprolactam is used in the manufacturing of synthetic fibres and can also be naturally occurring.

Hydrocarbon odours were not observed in the groundwater samples collected, and potential sources of hydrocarbons have not been identified in the soil analytical results.

BTEX, PAH, OCP/OPPs were not detected in the groundwater samples collected during the current investigation

PFAS was detected in the groundwater samples collected from SBT-GW-1037 and in samples collected during previous investigations.

Ammonia and phosphorus exceeded the adopted freshwater guidelines in previous sampling events. Higher concentrations of ammonia were reported in:

- SMGW-BH-A017
- SMGW-BH-A113
- SMGW-BH-A117

Dewatering of station box and portal dive excavations will temporarily alter the groundwater gradient, drawing in groundwater into this excavation that contains these dissolved COPC. It is assessed that the COPC at the concentrations reported in groundwater are unlikely to pose unacceptable risks to human health in a generic commercial / industrial setting. Nevertheless, monitoring groundwater quality during construction will be required on a six-monthly basis to reassess such risks, and future management of water within the station box and portal dive.

3.5. Conclusions and Recommendations

The following key conclusions were drawn from the DSI (TTMP, 2022c):

3.5.1. Contamination

TTMP considered that the soil within the site poses a low risk of contamination to the project given that no gross[7] contamination was identified within the site.

The investigation identified that there is the potential for ACM in soil materials in areas where ACM is to be removed as part of demolition activities and in areas where potential ACM has previously been observed or identified through soil analysis. CPBG has advised that the preference is to directly dispose these materials to landfill rather than retain them on-site for reuse. Potential also exists for contamination to be uncovered from areas which were inaccessible during the investigation such as beneath concrete slabs, sheds, septic tanks, etc.

The management controls outlined in Section 5.3 are to be implemented during the construction phase of works, with ground disturbance during future works proposed to be managed through implementation of standard construction practices including soil and water management techniques.

Unexpected contamination, if identified during future works, can be managed through implementation of an Unexpected Contaminated Finds Protocol included in the Project construction environmental management plan (CEMP).

3.5.2. Material / Waste Classification

The results suggest the fill soils would be preliminary classified as General Solid Waste (non-putrescible).

Asbestos finds suggest fill excavated in the footprint of one residential structure at 114-122 Kent Road should be managed as Special Waste (Asbestos Waste), with additional confirmatory sampling to be undertaken following the demolition of other structures to further characterise the status of fill within the footprint of other structures.

The investigation indicates that natural soil would provisionally classify as General Solid Waste (non-putrescible). The investigation has identified detections of organics (BTEX, TRH, PAH's and PFAS) and metal in samples of natural soils at varying depths which would preclude the classification of such materials as Virgin Excavated Natural Material (VENM), without further assessment.

Results suggest the soils sampled would be suitable for reuse at the FS01 site, provided they do not contain ACM. With the exception of three surface samples which contained elevated concentrations of PAH's and one surface sample containing elevated concentrations of benzene, remaining results were less than the Airport Regulations soil reuse criteria.

4. Remediation Options Assessment and Remediation Strategy

Based on the findings of the DSI and nature of the Project, a remedial options assessment and remediation strategy is not considered relevant or warranted.

[7] Gross contamination is considered to be an area of wide-spread contamination which exceeds relevant commercial/industrial health guidelines triggers a requirement for remediation to mitigate contamination impacts that are over and above the standard construction practices to make the site suitable for commercial / industrial use.

5. Soil and Water Management During Excavation

5.1. Summary of CPBG Soil and Water Management Plan

The Soil and Water Management plan (SWMP) (CPBG, 2022c) was prepared prior to completion of the DSIs for the project. The management strategies outlined in the SWMP (CPBG, 2022c) are presented in Table 11.

Table 4: Management Strategies (CPBG, 2022c)

Management Strategy	SWMP Section Reference
Potential for groundwater drawdown and management	7.2
Approach to minimising water usage and maximising reuse	7.3
Erosion and sediment control planning	7.4
Water discharge criteria and targets	7.5
Water treatment plant specifications	7.6
The design and management of sediment basins	7.7
Management of chemical and refuelling including spill management	7.8
Contamination management (including Unexpected Finds Protocol)	7.9
Environment Procedures for the above Management Strategies	Annexure C
Roles & Responsibilities of CPBG Team	Section 8
Systems & Tools to Implement SWMP	Section 9

The Environment Procedures for the above management strategies were provided in Annexure C of the SWMP (CPBG, 2022c). The roles and responsibilities of the CPB team and the specialist consultants are detailed in Section 8 of the SWMP (CPBG, 2022c). Section 9 of the SWMP (CPBG, 2022c) discusses the systems and tools available to implement the SWMP, namely, detailed erosion and sedimentation control plans, training, reporting, review, auditing and continual improvement and keeping records.

5.2. Aspects Requiring Management during Development

Previous investigations completed within the site has not identified contamination that has triggered the need to implement remediation at the site. The following aspects of the proposed development within the site requires management:

- Fill material within the footprint of structures following demolition as outlined in Section 3.2.
- Dam water if to be drained is to be managed in accordance with the requirements of the EPL.
- Sampling of dam sediment (following draining) to assess suitability for re-use on-site or disposal.

The following procedures will apply during the development of the site in addition to those generic procedures outlined within the SWMP (CPBG, 2022c).

5.3. Management of Spoil Excavated from the Footprints of Demolished Structures

The DSI was completed prior to demolition of existing structures on site. There is a potential risk from ACM in soil materials in areas where ACM was present and removed as part of demolition activities and in areas where potential ACM has previously been observed. CPBG have advised that the preference is to directly dispose these surface fill materials to landfill rather than retain them on-site for reuse. Potential also exists for contamination to be uncovered from areas which were inaccessible during the investigation such as beneath concrete slabs, sheds, septic tanks, and heavily vegetated areas that were not accessible during the investigation, etc. TTMP recommends that ground conditions be inspected by a competent person post demolition to check for indicators of contamination.

With the exception of areas where contamination is suspected (i.e. AEC20 and 114-122 Kent Road), the following management measures apply to areas where structures have been demolished, areas where waste materials are present and require removal, areas where fill materials containing anthropogenic materials are encountered, and/or areas where potential ACM materials have been previously observed:

- Shallow soil materials within the footprint of former structures, waste storage areas, areas of fill etc. are to be scraped to a nominal depth of 300mm, or to the surface of undisturbed natural ground (whichever is shallower). This material shall be stockpiled separately from other materials for assessment to determine its waste classification in accordance with the Waste Classification Guidelines (NSW EPA, 2014) prior to disposal off site as waste.
- Laboratory analytical data will be collated to determine the waste classification of the shallow soil and shall also be compared to the health and ecological investigation levels for a generic Commercial/Industrial land use as a gauge to assess whether potentially unacceptable contamination may remain within in-situ soil.
- A competent person shall complete a detailed inspection of the soil materials exposed (following removal of the nominal 300mm surface materials) within the footprint of former structures, waste storage areas, areas of fill etc. for indicators of potential contamination. Indicators of potential contamination may include stained or odorous soils, materials suspected to contain ACM etc.
- In the event that fill remains below a depth of 300mm and is to be retained, or where indicators of potential contamination are noted on fill/exposed natural soil, confirmatory samples shall be collected from in-situ soil within the excavation area and analysed for relevant COPC to confirm the suitability of these materials to remain on site

Shed at AEC 20: Soil materials are to be scraped to the depth of undisturbed natural ground. Materials from this shed are to be stockpiled and tested to determine its waste classification in accordance with the NSW EPA Waste Classification Guidelines (2014). Confirmatory samples shall be collected from the surface/shallow soil exposed beneath the footprint of this shed and analysed for COPC.

114-122 Kent Road (SBT-BH-1295): Fill material shall be removed to the surface of the natural material, or a nominal depth of 300mm. Where the excavation terminates in fill, confirmatory samples shall be collected to assess whether the remaining fill material is suitable to remain on site.

Fill materials: were typically not encountered on site. Where present, such materials were typically consistent with reworked natural materials. This shallow lithology is consistent with the rural residential land use of the site where extensive land filling is unlikely to have occurred. Where

deeper fill is encountered that is not consistent with reworked natural material and/or contains indicators of potential contamination (e.g. stained or odorous soils, buried wastes, suspected ACM etc.), this would be managed using the unexpected finds procedure.

Areas (not including beneath structures or vegetated areas) are to be visually inspected following the scrape-back of fill/topsoil to assess for indications of contamination such as drums or fibre cement sheeting suspected of containing asbestos. Where indications of contamination are noted, CPBG shall implement the Unexpected Finds Procedure (UFP).

Vegetated Areas: Following clearing of currently vegetated areas, a walkover to observe surface conditions will be undertaken. If visual indications of potential contamination are identified such as the presence of drums or fibre cement sheeting suspected of containing asbestos, additional sampling will be undertaken.

Unforeseen potential contamination: Ground disturbance during Preparatory Works within the OH site is proposed to be managed by CPBG through implementation of standard construction practices including soil and water management techniques as outlined in the Project Construction Environmental Management Plan (CEMP) including the Soil and Water CEMP Sub-Plan which includes an UFP. TTMP recommends that a competent person is present during disturbance of soil materials (outside of the areas listed above) to visually monitor for signs of potential contamination. Where these materials are encountered, they should be sampled, either in-situ or the materials may be stockpiled separately for subsequent investigation by TTMP in line with the UFP. The competent person must be experienced in the undertaking of excavation/remediation works and have the necessary experience to identify soil materials containing ACM and/or other unforeseen contamination.

Material Reuse: Based on project changes the required cut for site levelling activities is deeper than that considered during the development of the SAQP. The deeper cut will require excavation of natural materials. Based on the current analytical data for Orchard Hills, site won natural materials are considered suitable for re-use (from a contamination perspective) at Orchard Hills during site levelling activities provided they have been monitored by a competent person and do not contain indictors of contamination. CPBG is to maintain a record of where materials have been cut and placed as fill within the site.

5.4. Sediment and Erosion Controls

The SWMP provides generic procedures to control erosion and sediment laden runoff leaving the site. Controls are required to prevent sediment laden runoff entering or exiting the various dams located on site.

Sediment controls to be implement on site may include:

- Minimise or stage site clearance activities to retain vegetation on site, where practical.
- Diversion berms to channel clean water entering areas of the site where soil disturbance has taken place, and channel site runoff away from the existing dams.
- Provision of stockpile covers and diversion berms to channel runoff away from stockpiling areas.
- Use of rumble grids/wash bays on vehicle egress points to minimize vehicles tracking of sediment offsite.
- Regular inspection of the sediment controls to ensure they remain effective.

5.5. Classification of Spoil Excavated from the Development

Surplus spoil generated from development within the site shall be assessed to determine its suitability for beneficial reuse. Preliminary advice provided within the DSI (TTMP, 2022c) indicates spoil from this site is chemically suitable for reuse as fill within the Western Sydney Airport site (FS01 Site). CPBG must confirm that movement of spoil from this site to the FS01 can occur lawfully in accordance with the relevant regulatory requirements set out within the Protection of the Environment Operations (Waste) Regulation 2014 and Protection of the Environment Operations Act 1997). Where spoil is deemed surplus and cannot be beneficially reused, such spoil shall be classified in accordance with the procedures set out within the Waste Classification Guidelines (NSW EPA, 2014). Where sampling is required to confirm the waste classification of surplus soil, this shall be undertaken in accordance with the guideline provided in ASC NEPM (NEPC, 2013) and the Sampling Design Part 1 – Application (NSW EPA, 2022).

A Material Class Assessment has been prepared for the bulk excavation of the station box and dive structure and is reported in:

- TTMP (2022d) *Material Classification Assessment: Orchard Hills Station Box.* SMWSASBT-CPG-SWD-SW000-GE-RPT-040533. 12 October 2022

Material classification assessments prepared in accordance with the above guidance shall be documented in a formal report and cross-referenced in a material tracking register to record the fate of spoil removed from the site generated from the development.

The source location, volume, classification and destination of waste material removed from site will be tracked by the Contractor. The Contractor will ensure that a is maintained along with consignment dockets confirming receipt of the material at the disposal facility.

These records shall be provided to the Environmental Consultant to be included in the validation report (if required).

6. Validation Plan

6.1. Validation Objective

The intent of the soil validation works is to collect suitable and adequate data to assess whether the remediation objectives have been achieved.

6.2. Validation Strategy

6.2.1. Validation of soil exposed beneath former structures/waste storage areas

As noted in Section 5.3, CPBG will remove a nominal 300mm of soil in areas beneath former structures. Soil from this initial scrape shall be stockpiled separately to determine its waste classification. The following validation procedures will apply to assess whether in-situ soil is suitable to remain on site from a contamination perspective:

- A competent person shall complete a detailed inspection of the soil materials exposed (following removal of the nominal 300mm surface materials) within the footprint of former structures, waste

storage areas, areas of fill etc. for indicators of potential contamination. Indicators of potential contamination may include stained or odorous soils, materials suspected to contain ACM etc.

- In the event that fill remains below a depth of 300mm and is to be retained, or where indicators of potential contamination are noted on fill/exposed natural soil, confirmatory samples shall be collected from in-situ soil within the excavation area and analysed for the following COPC to confirm the suitability of these materials to remain on site:
  - **Residence**: heavy metals (8), OCPs/OPPs and asbestos.
  - **Workshop/shed/waste storage area**: heavy metals (8), BTEX, PAH, TRH, phenols, PFAS, OCPs/OPPs and asbestos.
- The approach shall be determined based on the guidance provided within the ASC NEPM (NEPC, 2013) to demonstrate these areas are suitable for a generic commercial/industrial land use. The sampling density adopted should take account of existing investigation data collated for this site and be consistent with recommendations set out within 'Sampling Design: Part 1 – Application' (NSW EPA, 2022).

6.2.2. Areas Requiring Validation

6.2.2.1. 114-122 Kent Road (SBT-BH-1295)

A positive detection of asbestos (chrysotile as asbestos fines / fibrous asbestos) was reported in SBT-BH-1295_0.10-0.2. SBT-BH-1295 is located immediately adjacent to a house which is to be removed as part of preliminary works. The following approach is proposed to validate the removal of fill from this area of the site:

- Scrape back of surface soils to a nominal depth of 300mm, or to the depth of natural material (whichever is shallowest) following demolition of the house and surface clearance inspection. The horizontal extent of the scrap-back is to extend a minimum of 1m beyond the drip line of the roof.
- The excavation is to inspected to confirm that fill/topsoil soils have been removed to the depth of natural soil.
- In the event that natural soil has still not been encountered following the initial 300mm scrape-back, excavation may proceed to the depth of natural or validation sampling may be undertaken to confirm removal of asbestos impacted fill and will include the following:

Field screening involved the following:

- Collection of a 10-litre bulk sample using a bucket.
- Sifting of the 10-litre bulk sample though a 7 mm sieve or spreading of material on a sheet of plastic of contrasting colour if the material is not amenable to sieving.
- Collection of suspected ACM fragments retained on the 7mm sieve for subsequent asbestos analysis (if identified).
- Collection of a separate 500 ml sample (approximate volume) from the test pit location/sample depth interval, for subsequent asbestos analysis.
- Collection of a minimum of one sample on each side of the house and one additional samples from the central area of the footprint (five samples in total).

6.2.2.2. AEC 20 (Shed located at 94-98 Kent Road)

The following management measures apply to the footprint of the large shed at AEC 20. Soil materials are to be scraped to the depth of undisturbed natural ground. Materials from this shed are to be stockpiled and tested to determine its waste classification in accordance with the NSW EPA Waste Classification Guidelines (2014). Confirmatory samples shall be collected from the surface/shallow soil exposed beneath the footprint of this shed and analysed for COPC including heavy metals (8), TRH/BTEXN, PAH/Phenols, PFAS, OCPs/OPPs and asbestos to confirm the suitability of these materials to remain on site. The investigation approach and sampling density shall be determined based on the guidance provided within the NSW EPA (2022); 'Sampling Design Part 1 – Application' and the ASC NEPM (NEPC, 2013).

6.3. Validation Criteria

Where validation sampling is required, it is considered that the following criteria is applicable.

6.3.1. Soil Health and Ecological Levels

The soil investigation levels are based on the following references:

- NEPC (2013); National Environmental Protection (Assessment of Site Contamination) Measure 1999, ('ASC NEPM').

Schedule B1, Guideline on Investigation Levels for Soil and Groundwater, of the ASC NEPM presents health-based investigation levels for different land uses as well as ecological investigation levels. In the event that validation of areas of the site are required, the applicable land use scenario is considered to be commercial/industrial land use.

6.3.2. Asbestos Materials in Soil

Schedule B1, Section 4 of the ASC NEPM (NEPC, 2013) provides guidance on the assessment of both friable and non-friable forms of asbestos in soil. This guidance is based on the WA DoH (2009) Guidelines that presented risk-based screening levels for asbestos in soil under various land use scenarios.

For the purpose of assessing asbestos impacts in soil, three groups are recognised:

- Asbestos Containing Material (ACM) - which is in sound condition although possibly broken or fragmented and the asbestos is bound in a matrix. This is restricted to material that cannot pass through a 7mm x 7mm sieve;
- Fibrous asbestos (FA) - friable asbestos material, such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products;
- Asbestos fines (AF) - includes free fibres of asbestos, small fibre bundles and also ACM fragments that pass through a 7mm x 7mm sieve.

The adopted health screening levels for asbestos in soil under the HSL D land use scenario is shown in Table 7.

Table 0: Health Screening Levels for Asbestos contamination in soil (NEPM 2013)

Form of Asbestos	Health Screening Level
	HSL D
Bonded ACM (% w/w)	0.05% w/w
FA and AF (% w/w)	0.001% w/w
All forms of Asbestos	No visible evidence for surface soil (top 10cm)

7. Assessment of Imported Material

7.1. General

It is understood that CPBG will need to import material for the Project.

Imported material shall be assessed in accordance with the Materials Reuse and Importation Procedure (refer to Appendix 3) to ensure suitability for use at the site.

TTMP recommends that quarried VENM is used where possible to reduce the risk of importing waste/contamination from other construction sites or in recycled products.

Imported material will be required to be suitable (from a contamination perspective) for the proposed land use. Imported soil/aggregate will be required to be classified as ENM or VENM, or other product having a suitable resource recovery exemption published by the NSW EPA.

Prior to importation, a suitably qualified and experienced contaminated land consultant shall assess whether the material is suitable for use at the site. To confirm the material is suitable for use, the following would be required:

- The contaminated land consultant conducts a detailed review of documentation provided by the material supplier to check whether the material complies with a suitable resource recovery exemption and order.
- Where adequate documentation is provided by the material supplier to demonstrate the material is suitable for use, the contaminated land consultant shall complete periodic inspections to check the material is consistent with the descriptions provided in the documentation.
- In the event that the documentation is not adequate to demonstrate the material is suitable for use or may potentially be suitable for use pending further assessment, the contaminated land consultant shall collect representative samples for laboratory analysis to assess whether the material is suitable for use. TTMP recommend that sampling and analysis is completed prior to importing the material to site.

Quarried VENM will be exempt from sampling and analysis if documentation confirming the VENM status can be provided by the supplier.

Recycled or processed products that are not VENM, or ENM from other sources will require sampling and analysis to be carried out to assess their suitability for use at the site.

7.2. Visual Inspections

Imported materials shall be visually inspected periodically during importation by a CPBG representative or the contaminated land consultant to check that the material is consistent with that described in the source documentation, and for the presence of potential contamination.

Records of each visual inspection undertaken by CPBG is to be documented in a form and include:

- Date and time of inspection
- Origin of material inspected
- Approximate volume of material inspected
- Representative photograph(s) of material inspected
- Confirmation that the material inspected is consistent with the source documentation.

Outcomes of the visual inspection will be based in the implementation of the Materials Reuse and Importation Procedure (refer to Appendix 3).

7.3. Sampling and Field Screening

Where sampling is required to be carried out to assess imported materials, fieldwork shall be undertaken by experienced and suitably qualified consultant following written field procedures based on industry accepted standard practice and the ASC NEPM 2013 and the Sampling Design: Part 1 Application (NSW EPA 2022).

Samples shall be collected from stockpiles during importation of the soil by a suitably qualified consultant. Soil samples shall be collected using a hand tools or excavator depending on the dimensions of the stockpile.

A photo-ionisation detector (PID) with 10.6 eV lamp may be used to screen soil samples for the potential presence of volatile organic compounds (VOCs).

Between each sampling location, new nitrile gloves shall be used to reduce the potential for cross contamination to occur.

Samples collected shall be identified by a unique sample identifier. The sample identifier will be included on all sample jars and associated paperwork including field sheets and chain of custody forms.

7.4. Sampling Equipment Decontamination Procedures

Non-disposable sampling equipment (e.g. trowel, shovel etc.) shall be decontaminated between each sampling location using the following approach or similar depending on the equipment used:

- Scrub all surface of the equipment with a wire brush to remove soil and/or gross contamination.
- Scrub the equipment in a bucket filled with a solution of phosphate and PFAS free detergent (e.g. Liquinox), using a brush that can reach all surfaces.
- Rinse the equipment in clean potable water.

7.5. Equipment Calibration

Equipment shall be calibrated as per the manufacturer's instructions.

The PID shall be bump tested at the commencement of each day of sampling and if necessary, during the day in accordance with the procedure provided by the supplier.

7.6. Field Quality Control Samples

The following types of field quality control samples shall be collected:

- Intra-laboratory and inter-laboratory duplicates at a minimum rate of 5% (i.e. 1 duplicate per 20 primary samples)
- Rinsate blanks, where non-disposable sampling equipment is used
- Trip blank and trip spike samples prepared by the laboratory.

Field duplicate soil samples shall be collected from soil immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into two sample jars. Samples shall be labelled so as to conceal their relationship to the primary sample from the laboratory.

Rinsate blanks shall consist of pre-preserved bottles filled with laboratory prepared water that is passed over decontaminated field equipment and then collected in containers used for the sampling process. Rinsate blanks shall be preserved in a similar manner to the original samples.

Trip blank and trip spike samples shall be prepared by the primary laboratory during soil validation sampling, carried to the field unopened and subjected to the same preservation methods as the primary field samples.

7.7. Laboratory Analysis

Selected soil samples will be analysed by ISO/IEC 17025 certified laboratories with National Association of Testing Authorities (NATA) accredited methods for the analytes outlined in Table 8. The analytical suite shall be determined by the contaminated land consultant based on the source and characteristics of the material.

Table 8: Proposed Laboratory Analysis for Imported Soil Materials

Type	Material Volume / Sampling Frequency	Analysis
VENM (not quarried)	Up to 250 m^3: 1/25m^3 250 m^3 - 2,500 m^3: 1/100m^3 up to 10 sample >2,500 m^3: 1/250m^3 With a minimum of 3 samples per source.	Source dependant although may include TRH, BTEX, PAH, OCP, OPP, PCB, PFAS, metals and asbestos.
ENM	As per Table 1 of the NSW EPA current ENM Order 2014	As per Table 4 of the NSW EPA current ENM Order 2014 (metals, electrical conductivity, pH, TRH, BTEX, PAHs, metals, foreign materials), PFAS, OCP, OPP, PCB and asbestos.
Other Soil Materials	Up to 250 m^3: 1/25m^3 250 m^3 - 2,500 m^3: 10 samples >2,500 m^3: 1/250m^3 With a minimum of 3 samples per source and per stockpile.	Source dependant although may include TRH, BTEX, PAH, OCP, OPP, PCB, PFAS, metals and asbestos.

7.8. Imported Material Assessment Criteria

The suitability of imported material shall be assessed again the following criteria presented in ASC NEPM 2013 and CRC CARE 2011.

7.8.1. Human Health Criteria

- Soil health investigation levels (HILs) for a commercial/industrial land use scenario (HIL-D).
- Soil health screening levels (HSLs) (direct contact) for a commercial/industrial land use scenario (HSL-D) and intrusive maintenance workers.

Soil HSLs relating for vapour intrusion would only require consideration where there is a potentially complete pathways for future site users to be exposed to contamination via the indoor air/vapour inhalation pathway.

7.8.2. Ecological Criteria

In the event that materials are imported to site for the purpose of landscaping, appropriate criteria for commercial/industrial land use will be adopted.

7.8.3. Management Limits

Management Limits for Total Recoverable Hydrocarbons (TRH) fractions for a commercial/industrial land use scenario.

7.8.4. Asbestos

No asbestos detected at the reporting limit of 0.1g/kg or via trace analysis.

7.9. Quality Assurance and Control

Project specific quality assurance/quality control (QA/QC) procedures shall be implemented to improve transparency, consistency, comparability, completeness, and confidence in the data collected.

The following data quality indicators (DQIs) shall be adopted.

Table 9: DQIs for Assessment of Imported Material with Sample Analysis

Item	Acceptable Limit
Analysis of blind (intra-laboratory) duplicates and split (inter-laboratory) duplicates.	Rate of 1:20 (5%) primary soil samples for the same analysis of primary samples; Calculation of relative percentage differences between primary and duplicate samples. RPD results for soil samples: • No Limit (where the average concentration is 0-10 x laboratory limit of reporting (LOR); • 50% (where the average concentration is 10-20 x laboratory LOR); and • 30% (where the average concentration is > 20 x laboratory LOR). RPDs will be considered where a concentration is greater than 10 times the LOR.
Analysis of rinsate blanks	Where non-disposable equipment is used, at least one (1) sample per batch of soil sampling or material type where the source and sampling methods are consistent; and Results less than the laboratory LOR.
Analysis of laboratory prepared trip blanks	At least one (1) sample per batch for soil samples or material type where the source and sampling methods are consistent where volatiles are analysed; and Results less than the laboratory LOR.
Analysis of laboratory prepared trip spikes	At least one (1) sample per batch for soil samples or material type where the source and sampling methods are consistent where volatiles are analysed; and

Item	Acceptable Limit
	Results within 60-120% recovery.
Analysis of laboratory blanks, surrogates, reference and control samples	The laboratories will be required to conduct their own internal quality program for assessment of the repeatability of the analytical procedures and instrument accuracy under their NATA accreditation. This will include analysis of laboratory blank samples, duplicate samples, spike samples, control samples and surrogate spikes. The laboratory QA/QC procedures and results will be described within the laboratory reports. The laboratory internal QA/QC sample results will be reviewed for comparison with the laboratory's NATA guidelines and Schedule B3 of the ASC NEPM 2013.
Laboratories and methods used	National Association of Testing Authorities accredited for the method. Methods should be in accordance with amended ASC NEPM 2013.
Holding times	Samples should be analysed within recommended holding times.
Sample LORs	Results less than the adopted assessment criteria; justify/quantify if different.

7.10. Reporting

Material classification assessment reports shall be prepared to document the assessment carried out and confirm, or otherwise, the suitability of the imported material for use in the Project.

8. Validation Report

At the completion of the SBT Works, a Validation Report shall be prepared in general accordance with NSW EPA 2020 and the ASC NEPM 2013, documenting the SBT Works completed within the site. This report shall contain information including:

- Information demonstrating compliance with appropriate regulations and guidelines.
- Information relating to visual ground clearances following demolition of structures at the site.
- Information demonstrating compliance with this RAP.
- Site observation field registers, supported by photographs.
- Results of validation or confirmatory sampling that has been undertaken.
- Details of the source, classification and suitability of all imported materials.
- Details of environmental incidents and/or unexpected finds of contamination occurring during the course of the SBT Works (including but not limited to Preparatory Works and bulk excavation) and the actions undertaken in response to these incidents.
- Details on waste classification, tracking and off-site disposal (including EPL details).
- Details on the reuse of materials on-site or within the FS01 site (where materials are moved off the OHS to other parts of the SBT site, a tracking register should be maintained).
- Clear statement of the suitability of the site that is the subject of the validation report, for the STB Works.
- The Validation Report is to be submitted to the Site Auditor for review upon completion.

9. References

ANZECC/ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000*

ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018*

Cardno (2021); Contamination Assessment Report – Phase D/E, Sydney Metro Western Sydney Airport (Ref: 80021888; RevB, dated 22nd November 2021)

Cardno (2021); *Contamination Assessment Report, Sydney Metro Western Sydney Airport* (Ref: 80021888; dated 5th May 2021)

CPBG (2022a) *Asbestos Management Plan (AMP), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works*, Rev A, dated 2 February 2022

CPBG (2022b) Construction Environment Management Plan (CEMP), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works, Preparatory Works, Rev 2 dated 13 April 2022

CPBG (2022c) NSW (Off-Airport) Soil and Water Management Sub Plan (SWMP), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works, Rev A dated 19 May 2022

CRC Care (2011) *Technical Report No. 10, Health screening levels for petroleum hydrocarbons in soil and groundwater*

GHD (2019) *Western Sydney Airport, Remediation Action Plan* (Ref: WSA00-WSA-0040-EN-PLN-00001, dated June 2019)

Golder & Douglas Partners (Feb 2021); *Factual Contamination Report – Preliminary Site Investigation* (Ref: 19122621-003-R-Rev3; Rev3; dated 19th February 2021)

NEPC (2013); *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (the 'ASC NEPM')

NSW EPA (1995); *Sampling Design Guidelines*

HEPA (2020) *PFAS National Environmental Management Plan (PFAS NEMP) 2.0, 2020*.

M2A (2020) *Sydney Metro - Western Sydney Airport Technical Paper 8 Contamination*

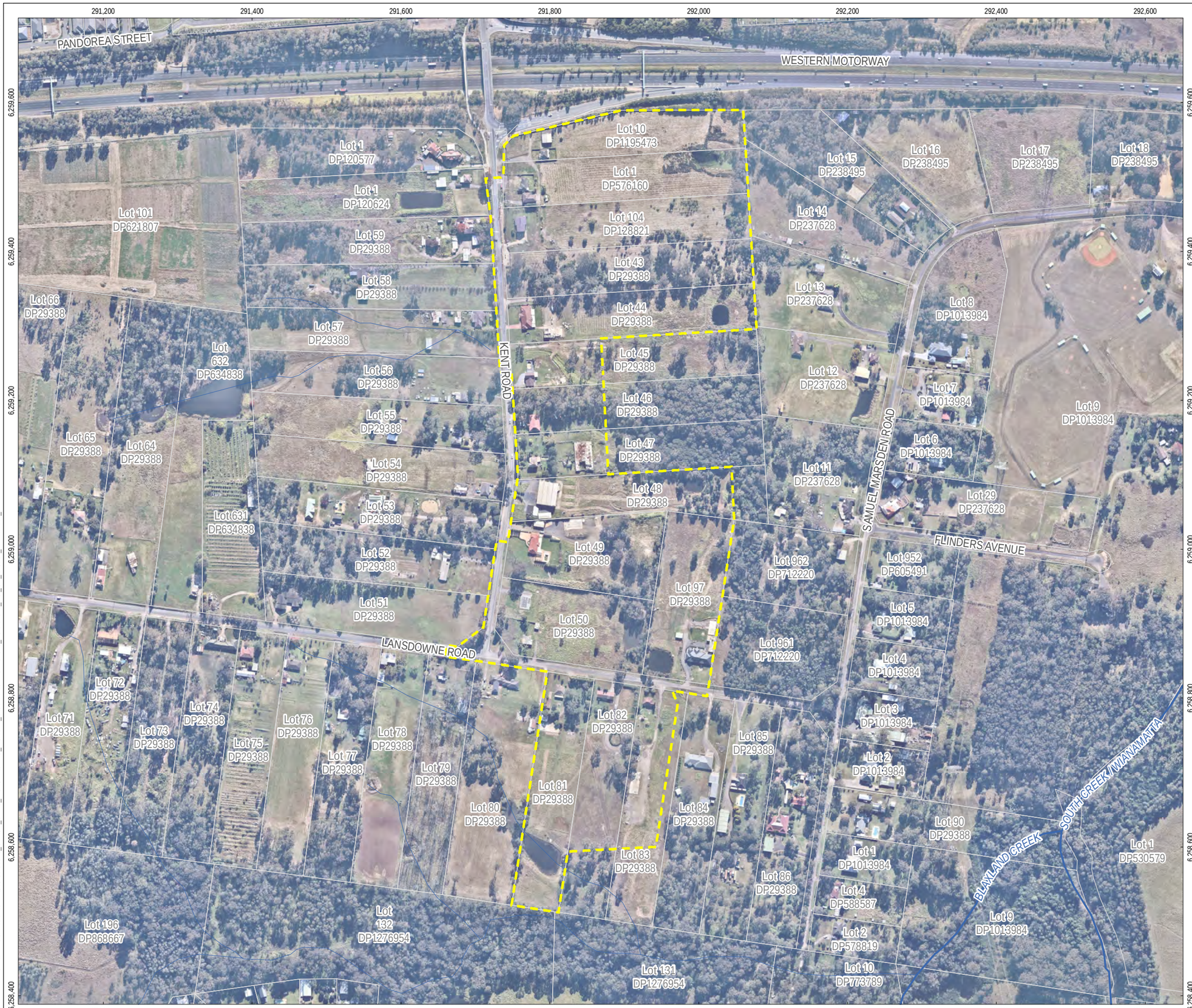
TTC (2022a) *Western Sydney Airport Station Boxes and Tunnels Tender, Hydrogeological Interpretative Report*.

TTC (2022b) *Western Sydney Airport Station Boxes and Tunnels Tender, Orchard Hills Station Sampling and Analysis Quality Plan*.

TTMP (2022c) *Western Sydney Airport Station Boxes and Tunnels Tender, Orchard Hills Station Detailed Site investigation*.

TTC (2022d) *Technical Memorandum: Preliminary Soil Results Orchard Hills Station*.

Appendix 1 Figures



LEGEND

- Perennial Watercourse
- Non-perennial Watercourse
- Cadastral Boundary
- OH Site Boundary

SOURCE
Site boundary from Tetra Tech Coffey.
Watercourses and cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

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SCALE 1:5,000
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

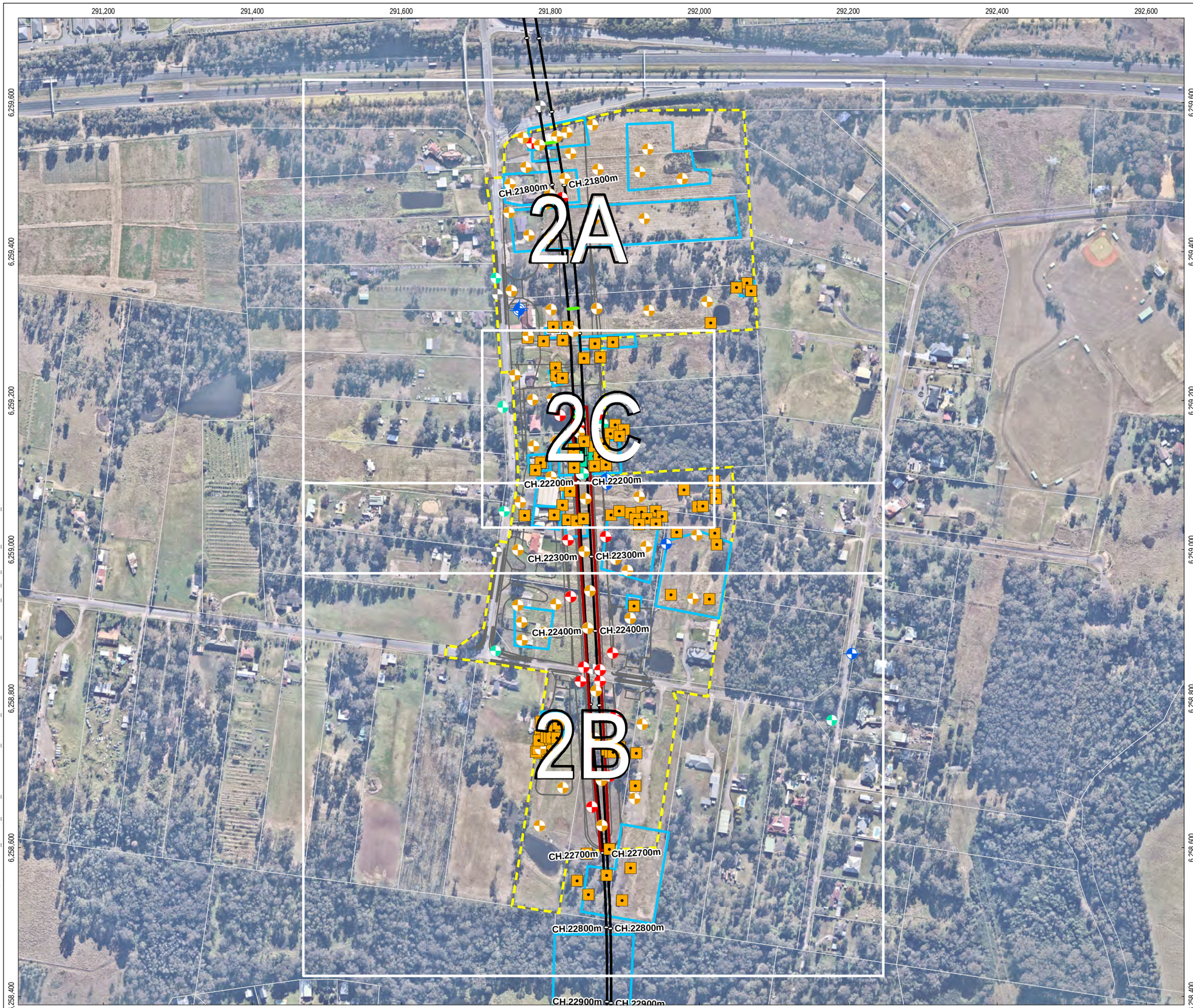
WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 1

Site Location Plan -Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

DATE: 26.07.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F001_GIS



CPB CONTRACTORS

Ghella 1894 5 Generations of Tunnelers

LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Existing Investigation Location
- Borehole

Investigation Location - Cardno
- Borehole
- Hand Auger
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Tunnel Alignment - Cross Passage
- Orchard Hills and Portal Dive Structure Site Layout
- Cadastral Boundary
- Areas of Environmental Concern
- OH Site Boundary
- Station Box and Portal Dive Structure

SOURCE
Contaminated land locations, additional investigations, site boundary, and hand samples from Tetra Tech Coffey.
Existing investigations, site layout, station box and alignment supplied by CPBG.
Investigation locations from Cardno.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

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SCALE 1:5,000
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

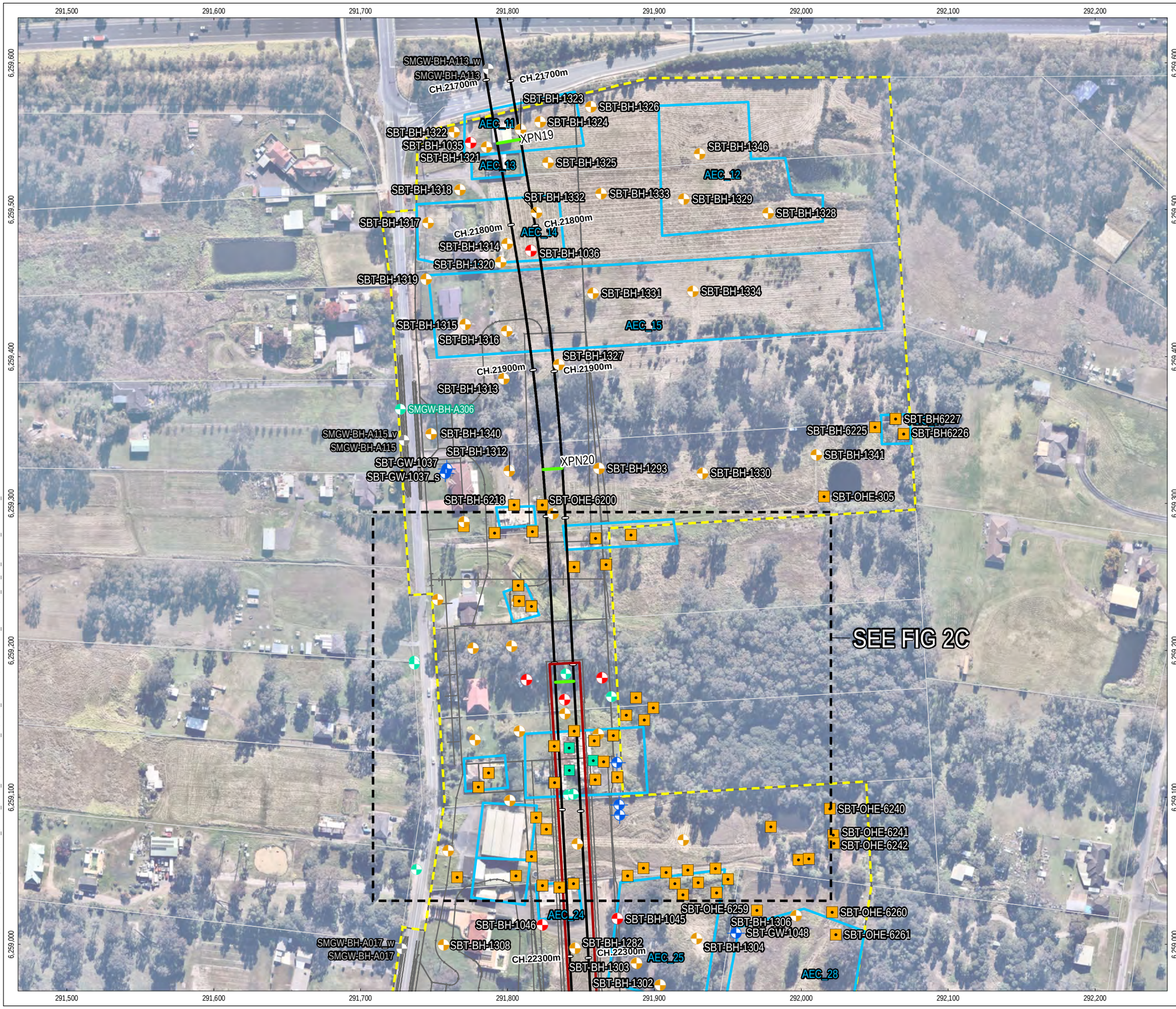
WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 2

Contaminated Land Locations -Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

DATE: 07.09.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F002_GIS



LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Existing Investigation Location
- Borehole

Investigation Location - Cardno
- Borehole
- Hand Auger
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Tunnel Alignment - Cross Passage
- Orchard Hills and Portal Dive Structure Site Layout
- Cadastral Boundary
- Areas of Environmental Concern
- OH Site Boundary
- Station Box and Portal Dive Structure

SOURCE
Contaminated land locations, additional investigations, site boundary, and hand samples from Tetra Tech Coffey.
Existing investigations, site layout, station box and alignment supplied by CPBG.
Investigation locations from Cardno.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

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SCALE 1:2,500
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

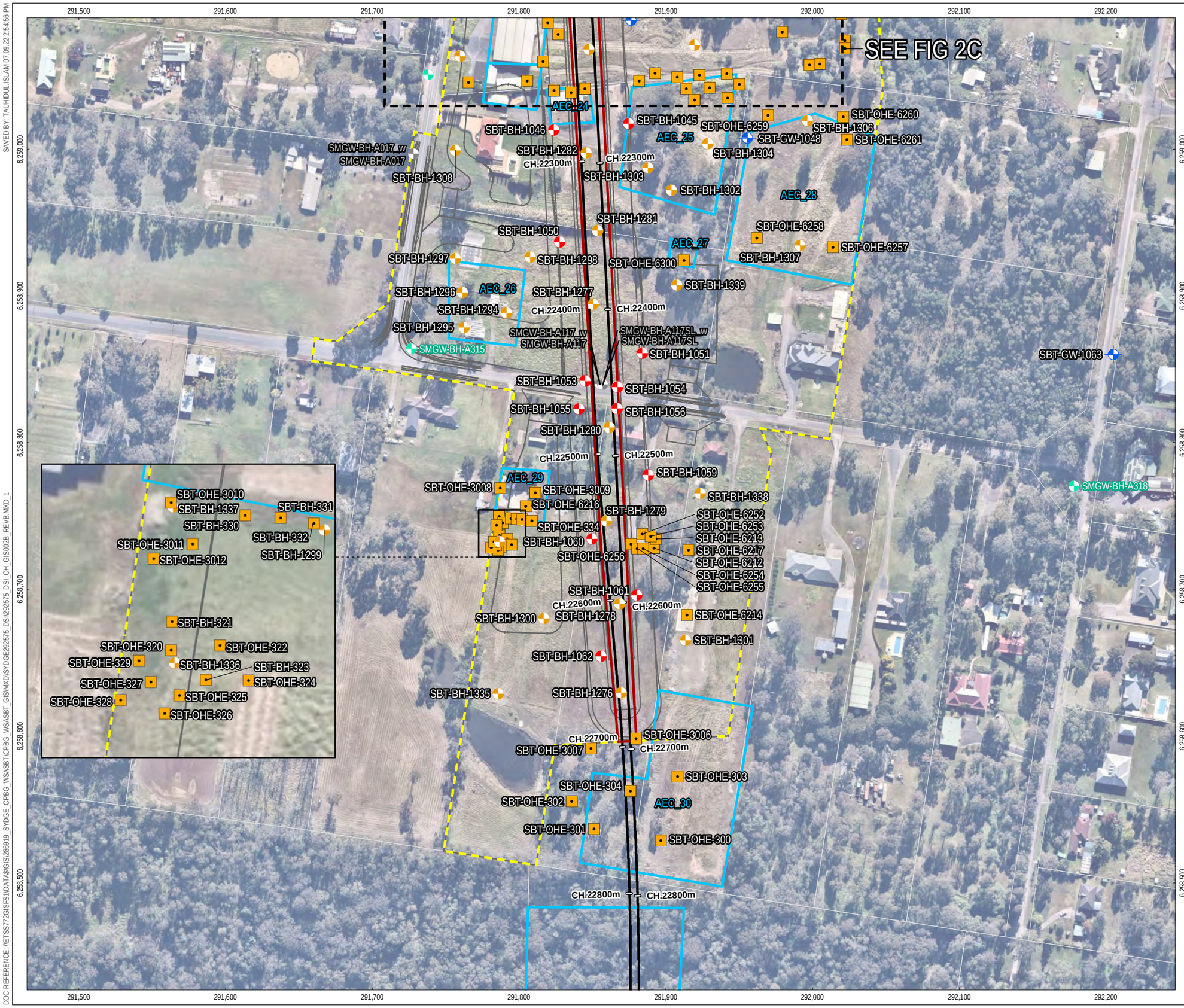
WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 2A

Contaminated Land Locations -Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

DATE: 07.09.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F002A_GIS



LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Existing Investigation Location
- Borehole

Investigation Location - Cardno
- Borehole
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Orchard Hills and Portal Dive Structure Site Layout
- Cadastral Boundary
- Areas of Environmental Concern
- OH Site Boundary
- Station Box and Portal Dive Structure

SOURCE
Contaminated land locations, additional investigations, site boundary, and hand samples from Tetra Tech Coffey.
Existing investigations, site layout, station box and alignment supplied by CPBG.
Investigation locations from Cardno.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

0 50 100 m

SCALE 1:2,500
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 2B

Contaminated Land Locations -Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

DATE: 07.09.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F002B_GIS

LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Investigation Location - Cardno
- Borehole
- Hand Auger
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Tunnel Alignment - Cross Passage
- Orchard Hills and Portal Dive Structure Site Layout
- Cadastral Boundary
- Areas of Environmental Concern
- OH Site Boundary
- Station Box and Portal Dive Structure

SOURCE
Contaminated land locations, additional investigations, site boundary, and hand samples from Tetra Tech Coffey.
Existing investigations, site layout, station box and alignment supplied by CPBG.
Investigation locations from Cardno.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

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SCALE 1:1,000
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 2C

Contaminated Land Locations -Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

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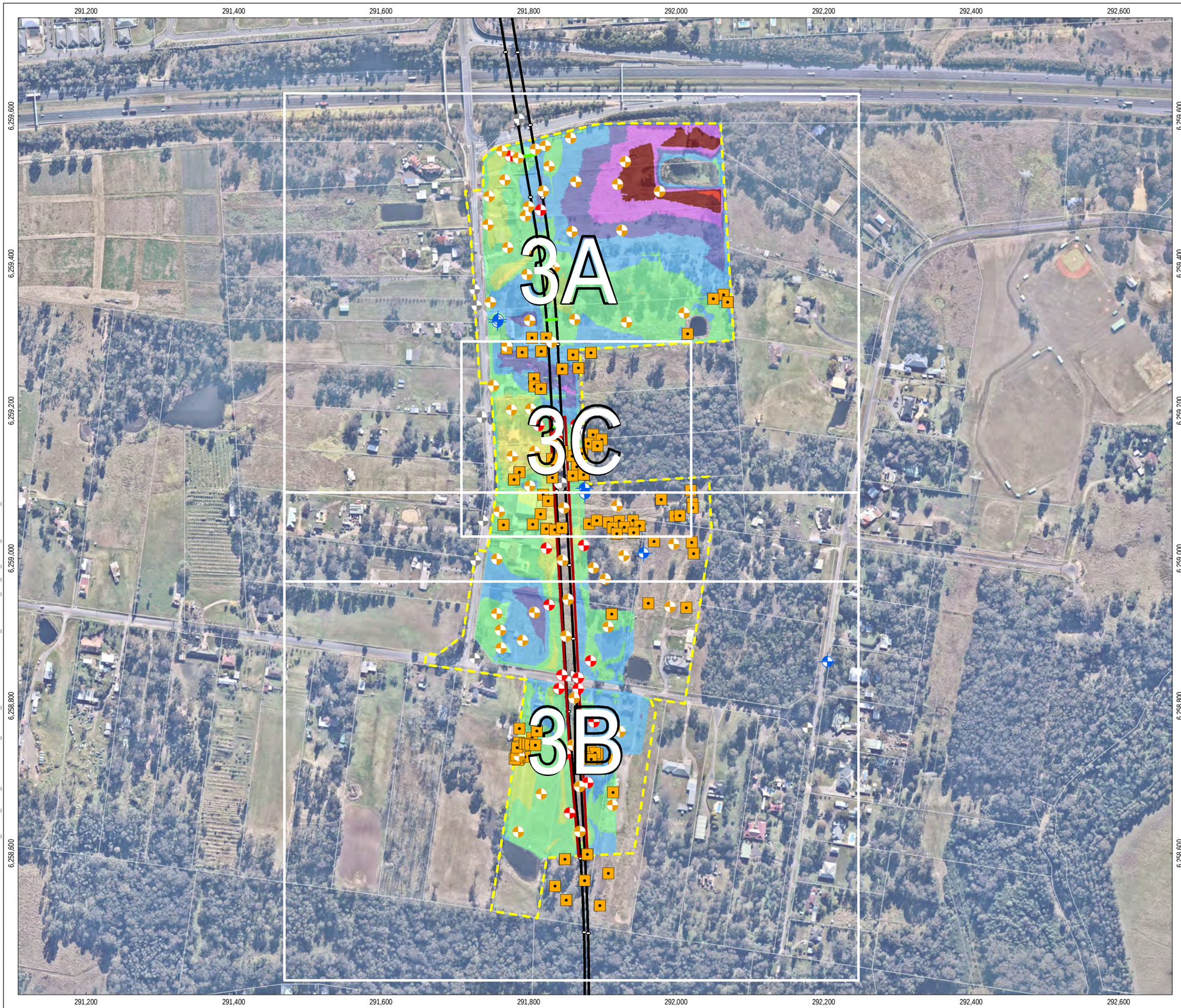

CPB CONTRACTORS

Ghella 1894 5 Generations of Tunnelers

LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Existing Investigation Location
- Borehole
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Tunnel Alignment - Cross Passage
- Cadastral Boundary
- OH Site Boundary
- Station Box and Portal Dive Structure

Cut and Fill
- -4 m to -3 m
- -3 m to -2 m
- -2 m to -1 m
- -1 m to 0 m
- 0 m to 1 m
- 1 m to 2 m
- 2 m to 3 m
- 3 m to 4 m
- 4 m to 5 m

SOURCE
Contaminated land locations, additional investigations, site boundary, and hand samples from Tetra Tech Coffey.
Existing investigations, site layout, station box, cut/fill and alignment supplied by CPBG.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

0 100 200 m

SCALE 1:5,000
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 3

Site Establishment Works - Orchard Hills Station and Portal Drive Structure

TETRA TECH COFFEY

DATE: 07.09.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F003_GIS

291,600 291,800 292,000 292,200

6,259,600 6,259,400 6,259,200 6,259,000

SMGW-BH-A113_w
SMGW-BH-A113
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CH.21700m
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SBT-BH-1326
SBT-BH-1324
SBT-BH-1322
SBT-BH-1035
SBT-BH-1321
XPN19
SBT-BH-1325
SBT-BH-1346
SBT-BH-1318
SBT-BH-1333
SBT-BH-1329
SBT-BH-1328
SBT-BH-1332
SBT-BH-1317
CH.21800m
CH.21800m
SBT-BH-1314
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SBT-BH-1334
SBT-BH-1315
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SBT-BH-6225
SMGW-BH-A115_w
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SBT-BH-1340
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SBT-BH-1341
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SBT-OHE-6200
SBT-OHE-305
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SBT-OHE-6241
SBT-OHE-6242
SBT-OHE-6259
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CH:22300m
CH.22300m
SBT-BH-1304
SBT-BH-1303
SBT-BH-1302

LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Existing Investigation Location
- Borehole
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Tunnel Alignment - Cross Passage
- Cadastral Boundary
- OH Site Boundary
- Station Box and Portal Dive Structure

Cut and Fill
- -4 m to -3 m
- -3 m to -2 m
- -2 m to -1 m
- -1 m to 0 m
- 0 m to 1 m
- 1 m to 2 m
- 2 m to 3 m
- 3 m to 4 m
- 4 m to 5 m

SOURCE
Contaminated land locations, additional investigations, site boundary, and hand samples from Tetra Tech Coffey.
Existing investigations, site layout, station box and alignment supplied by CPBG.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

0 50 100 m

SCALE 1:2,500
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

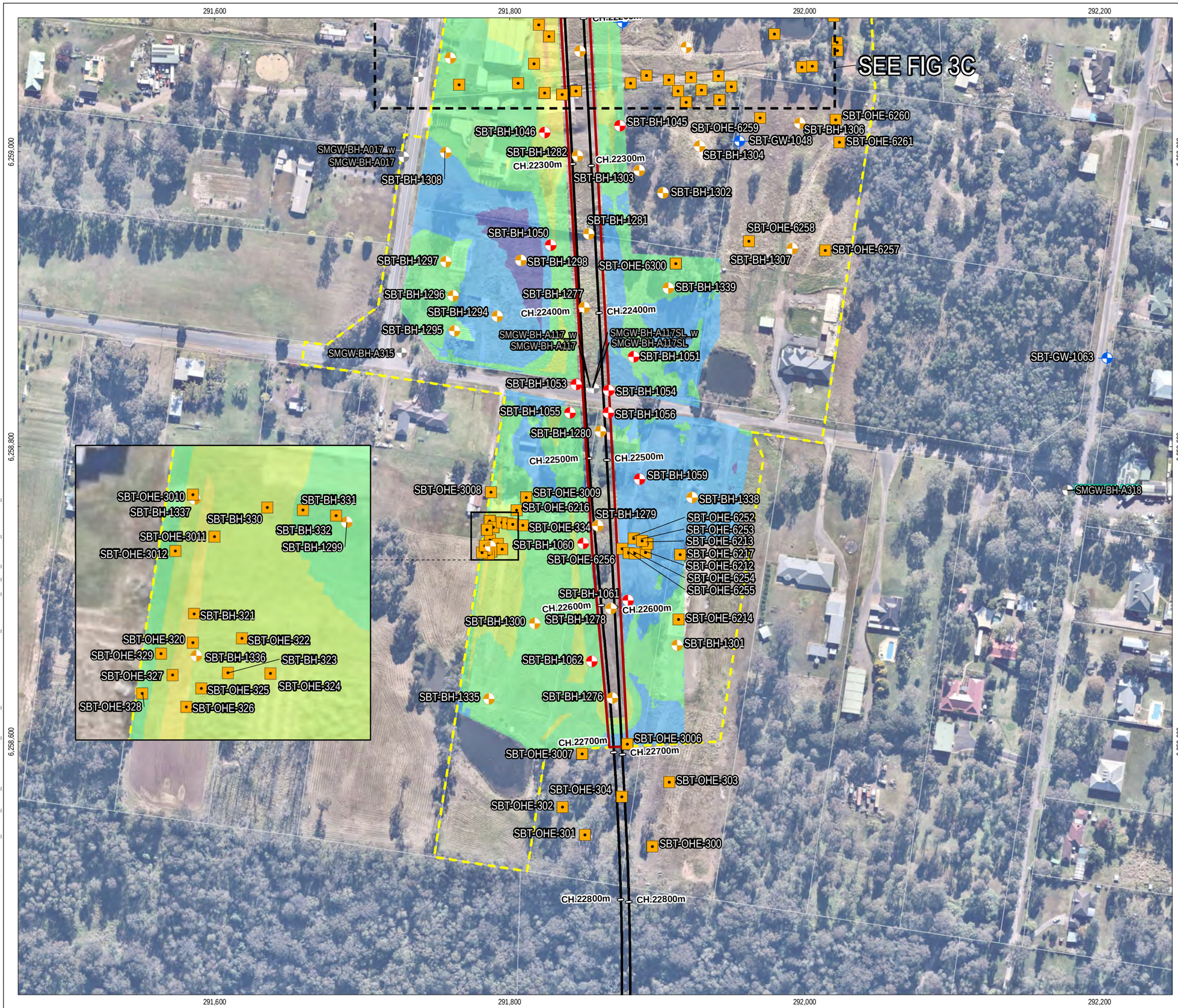
WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 3A

Site Establishment Works - Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

DATE: 07.09.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F003A_GIS



LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Existing Investigation Location
- Borehole
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Cadastral Boundary
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Cut and Fill
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- -2 m to -1 m
- -1 m to 0 m
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- 1 m to 2 m

SOURCE
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Existing investigations, site layout, station box, cut/fill and alignmentnsupplied by CPBG.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

0 50 100 m

SCALE 1:2,500
PAGE SIZE: A3
PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

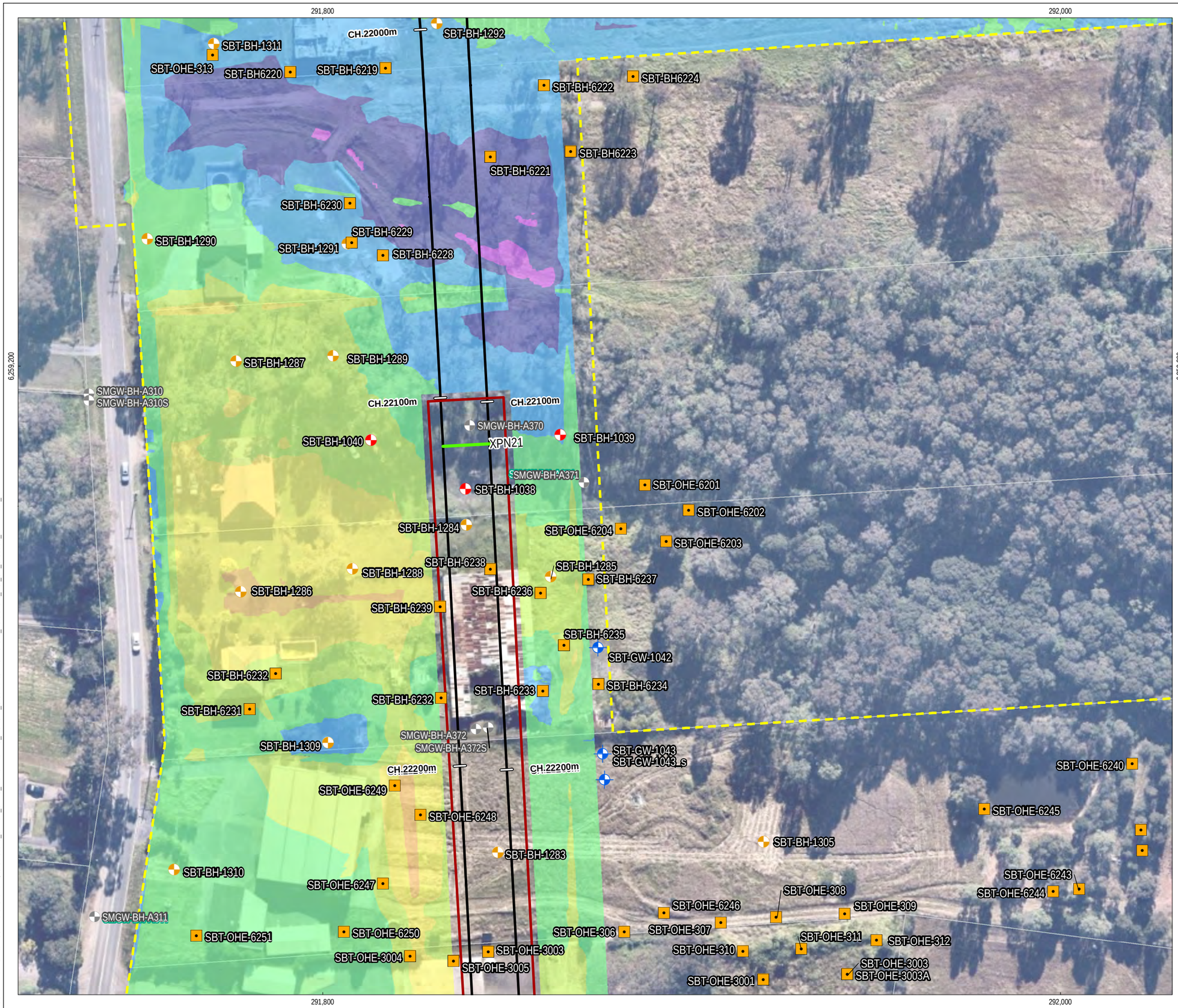
WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 3B

Site Establishment Works - Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

DATE: 07.09.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F003B_GIS



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DOC REFERENCE: \\ET\SS772GISFS1\DATA$\GIS\286919_SYDGE_CPBG_WSASBT\CPBG_WSASBT_GIS\MXD\SYDGE292575_DSI292575_DSI_OH_GIS003C_REVB.MXD_1

CPB CONTRACTORS

Ghella 1894 5 Generations of Tunnelers

LEGEND

Additional Contaminated Land Location
- Borehole
- Hand Sample

Additional Geotechnical/Hydrogeological Location
- Borehole
- Monitoring Well

Existing Investigation Location
- Borehole
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Tunnel Alignment - Cross Passage
- Cadastral Boundary
- OH Site Boundary
- Station Box and Portal Drve Structure

Cut and Fill
- -4 m to -3 m
- -3 m to -2 m
- -2 m to -1 m
- -1 m to 0 m
- 0 m to 1 m
- 1 m to 2 m
- 2 m to 3 m

SOURCE
Contaminated land locations, additional investigations, site boundary, and hand samples from Tetra Tech Coffey.
Existing investigations, site layout, station box, cut/fill and alignment supplied by CPBG.
Cadastre from DFSI.
Aerial imagery from Nearmap (capture date 14-06-2022).

N

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SCALE 1:1,000
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PROJECTION: GDA2020 MGA Zone 56

CPB - GHELLA

WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 3C

Site Establishment Works - Orchard Hills Station and Portal Dive Structure

TETRA TECH COFFEY

DATE: 07.09.22 PROJECT: 754-SYDGE292575 FILE: 292575_DSI_OH_F003C_GIS