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Executive Summary

Ramboll Australia Pty Ltd (Ramboll) was engaged by Transport Asset Holding Entity (TAHE) on behalf of Transport for NSW (TfNSW) to complete a targeted assessment of contamination in soil in the Country Regional Network (CRN) at Captains Flat, New South Wales (NSW) (the site).

On 25 September 2020 TfNSW notified the NSW EPA of site contamination under section 60 of the CLM Act. On 22 April 2021 the NSW EPA declared the loader and surrounding rail corridor (Lot 4425 DP1217100) as significantly contaminated land (Declaration Number: 20211105) and on 25 June 2021 TfNSW submitted a Voluntary Management Proposal (VMP) describing a pathway and schedule for managing contamination from the declared site. Under the VMP TfNSW coordinated assessment and management through preparation of the following key documents:

- Captains Flat Rail Corridor Environmental Management Plan (Ramboll, March 2022 Rev 5) for contaminants at or from the Captains Flat rail corridor
- Detailed Site Investigation (DSI) completed to assess contaminant exposure risks in the context of commercial / industrial land use (ongoing non-operational rail corridor) (Ramboll, April 2022 Rev 6)
- Communications Plan (TfNSW, June 2022)
- Remediation Options Assessment (ROA) assessing remediation options to make the site
 suitable for alternate future land use comprising a mix of public open space (part of the
 Captains Flat Heritage Walking Trail and commercial / industrial land use (ongoing
 operation of the Captains Flat SES depot). The extent of contamination in soil adjacent
 the current SES presenting potential risks under future use as a public open space was
 identified as a data gap. Similarly, the extent of contamination within the Copper Creek
 rail culvert embankments was identified as a data gap. (Ramboll, November 2022 Rev 5).
- Remediation Action Plan (Ramboll November 2022 Rev 4) prepared for proposed public open space land use and including the following items:
 - Excavation of soils exceeding HILs and HSLs protective of human health under a public open space land use scenario (excluding the SES Depot).
 - Consolidation and capping of contamination within Copper Creek culvert embankment through construction of sandstone block walls
 - o Importation of clean soil to construct a cap over consolidated EIL exceedances and reinstate the existing landform (excluding current rail formations)
 - Landscaping to support specific reuse under public open space land use scenario including selection of flora species endemic to the region
 - Preparation of a Long Term Environmental Management Plan (LTEMP) to manage contamination retained onsite post remediation

This report is an addendum to the DSI (Ramboll, 2022b) and presents the findings of a soil investigation targeted to address data gaps identified in the ROA.

The scope of work comprised:

- Advancement of six (6) test pits targeting the vertical extent of contamination in the culvert embankment
- Advancement of fourteen (14) hand augers targeting the extent of contamination around the SES Depot
- Field screening of lateral and vertical extent of metals through fpXRF
- Refinement of the existing Conceptual Site Model (CSM)
- Preparation of this report.

The additional data improves the site characterisation and refines the extent of soil remediation required to make the site suitable for proposed public open space land use and is intended to supplement the information contained in the DSI.

1. Introduction

Ramboll Australia Pty Ltd (Ramboll) was engaged by Transport Asset Holding Entity (TAHE) care of Transport for NSW (TfNSW) to complete a targeted assessment of contamination in soil at the Captains Flat Rail Corridor, in the Country Regional Network (CRN) at Captains Flat, New South Wales (NSW) (the site).

On 25 September 2020 TfNSW notified the NSW EPA of site contamination under section 60 of the CLM Act. On 22 April 2021 the NSW EPA declared the loader and surrounding rail corridor (Lot 4425 DP1217100) as significantly contaminated land (Declaration Number: 20211105) and on 25 June 2021 TfNSW submitted a Voluntary Management Proposal (VMP) describing a pathway and schedule for managing contamination from the declared site. Under the VMP TfNSW coordinated assessment and management through preparation of the following key documents:

- Captains Flat Rail Corridor Environmental Management Plan (Ramboll, March 2022c Rev
 for contaminants at or from the Captains Flat rail corridor
- Detailed Site Investigation (DSI) completed to assess contaminant exposure risks in the context of commercial / industrial land use (ongoing non-operational rail corridor) (Ramboll, April 2022 Rev 6)
- Communications Plan (TfNSW, June 2022)
- Remediation Options Assessment (ROA) assessing remediation options to make the site suitable for alternate future land use comprising a mix of public open space (part of the Captains Flat Heritage Walking Trail and commercial / industrial land use (ongoing operation of the Captains Flat SES depot). The extent of contamination in soil adjacent the current SES presenting potential risks under future use as a public open space was identified as a data gap. Similarly, the extent of contamination within the Copper Creek rail culvert embankments was identified as a data gap. (Ramboll, November 2022d Rev
- Remediation Action Plan (Ramboll November 2022 Rev 4) prepared for proposed public open space land use and including the following items:
 - Excavation of soils exceeding HILs and HSLs protective of human health under a recreational / public open space land use scenario (excluding the SES Depot).
 - Consolidation and capping of contamination within Copper Creek culvert embankment through construction of sandstone block walls
 - o Importation of clean soil to construct a cap over consolidated EIL exceedances and reinstate the existing landform (excluding current rail formations)
 - Landscaping to support specific reuse under Recreation / Public Open Space land use scenario including selection of flora species endemic to the region that are shallow rooted to suit cap specifications
 - o Preparation of a Long Term Environmental Management Plan (LTEMP) to manage contamination retained onsite post remediation

A Sampling and Analysis Quality Plan (SAQP) was prepared by Ramboll (Ramboll, 2024) to provide context, justification and details of the selected sampling and analysis approach for the addendum to the DSI. This SAQP was prepared in general accordance with Table 2.2 of the NSW Environmental Protection Authority (EPA) (2020) *Consultants reporting on contaminated land: Contaminated Land Guidelines*.

This report is an addendum to the DSI (Ramboll, 2022b) and presents the findings of a soil investigation targeted to address data gaps identified in the ROA.

1.1 Objectives

The objective of this investigation was to further assess the lateral extent of soil contamination south and east of the SES compound and the vertical extent of soil contamination within and around the Copper Creek culvert embankments to further define the extent of soil remediation required to make the site suitable for the proposed mixed public open space and commercial / industrial land use.

1.2 Scope of Work

The scope of work for preparation of this DSI included:

- Advancement of test pits and hand augers to facilitate assessment of potential contaminants associated with the general operation of the rail corridor
- Refinement of the existing CSM
- Preparation of this report.

2. Site Characterisation

2.1 Site Identification

Site details are summarised in **Table 2-1**. The site locality is presented in **Figure 1**, **Appendix 1**.

Table 2-1: Site Identification

Information	Description
Street Address:	Copper Creek Road, Captains Flat NSW
Identifier:	Lot 4425 Deposited Plan (DP) 1217100 and Lot 1 DP 572636
Site Area:	Approximately 2.05 hectares (Ha) ¹
Local Government:	Queanbeyan-Palerang Regional Council
Owner:	Owned by TAHE, managed by TfNSW under license to UGL Regional Linx as part of the CRN
Current Site Use:	Commercial / industrial – non-functioning rail corridor
Proposed Site Use:	Public open space (heritage walking trail) and commercial / industrial (SES depot)

¹ The area of assessment is a linear land parcel within the CRN. Site boundaries within this report are defined based on the area of rail corridor assessed. The CRN continues beyond the northern site boundary.

2.2 Site Details

The site forms a section of the Bungendore Junction to Captains Flat Line that operated between Bungendore and Captains Flat between 1940 and 1969 and is part of the Captains Flat Railway Precinct that is Heritage Listed under the *Palerang Local Environmental Plan LEP 2014*. The rail corridor between Captains Flat and Bungendore is not operational, and vegetation has overgrown existing rail tracks. A former residence located at 2 Copper Creek Road (Lot 1 DP 572636) has recently been acquired by TfNSW and now forms part of the site.

The former ore loadout facility located in the central portion of the site has been partially demolished and few of the existing structures remain such as remnants of a gantry crane and a rail turntable. The timber loading ramp and weighbridge shed were removed around 2013.

A filled portion of the track extends from Copper Creek Road to the former rail turntable to the north (which forms part of the heritage trail).

A fenced off portion of the site including the former railway goods shed is currently leased by the NSW State Emergency Services (SES) as the Captains Flat Depot.

Endangered ecological communities – plant type community PCT 283 (GHD, 2022) are located to the south-west of the site and in areas identified as contaminated. These areas are proposed to be fenced off and not remediated to limit access and exposure to site users.

2.3 Site History

A detailed review of historical records relevant to site contamination is presented in the Captains Flat Rail Corridor Preliminary Site Investigation (PSI) (Ramboll, 2021a). The Ramboll 2022 RAP summarised that the site was used as a section of the Bungendore Junction to Captains Flat railway line and as part of the former ore loadout facility for the adjacent Lake George (legacy) Mine between 1939 until 1969. Since then, the site has remained largely unused however it is understood that the site forms a portion of the Captains Flat Heritage Trail, a walking path which follows historic landmarks of the former mine and the associated town.

The presence of contamination associated with the Lake George mine appears to have been first formally identified in 1911 when contamination from the mine and the potential impact on downstream areas was noted in the NSW parliament. In 2018 GHD was commissioned by the NSW Department of Planning and Environment (DPE) Division of Resources and Geoscience (DRG) which hosts the Legacy Mines Program (LMP), to perform an assessment of the Lake George mine. The mine area was mostly devoid of vegetation and had large areas of sulfidic and other metalliferous waste rock and mineralisation exposed at surface, as well as accumulation of metallic sulfate salts. A very high potential for erosion and off-site transportation of dissolved and solid contamination through runoff and wind-borne dust was identified.

The adjacent Lake George mine is the primary source of contamination related to metalliferous mining and potential contamination within the surrounding area.

3. Site Condition and Surrounding Environment

A detailed review of the site condition and surrounding environment is presented in the DSI (Ramboll, 2022b). A summary is presented below in **Table 3-1**.

Table 3-1 Summary of site condition and surrounding environment

Site Aspect	Summary		
Topography	Moderate north facing slope intersected by a moderate – steep gully directing Copper Creek which flows in a south-westerly direction.		
Elevation	860 – 870 mAHD		
Nearby sensitive receptors	 Human receptors include: Residence located approximately 150 m west of the site Nearby township of Captains Flat Environmental receptors include: Copper Creek which flows through the site beneath the rail corridor via a culvert 		
	The site is primarily surrounded by land zoned RU1 Primary Production with several surrounding sites Heritage Listed under the Palerang LEP 2014. Surrounding land use includes:		
Surrounding land use	North: Copper Creek, Captains Flat Road, bushland, former Captains Flat Railway Station and Captains Flat to Bungendore Rail Line. East: Former goods shed Miners Road, Northern Tailings Dump of the former Lake George Mine, Captains Flat Sewage Treatment Plant, residential community of Captains Flat South: Processing area of the Former Lake George Mine adjacent and uphill from the site and known to be contaminated by historic mining practices, bushland West: Copper Creek, Roscommon, large lot residential properties		
Nearby heritage	Heritage listings apply to the site and surrounds and include: The Captains Flat Railway Precinct including a Goods Shed (leased to the State Emergency Service (SES)) and other remnant rail infrastructure from the southern end of the rail corridor to the north side of the Station The Captains Flat Railway Station Group – constructed in 1939 and converted into a private home in 1974 (Pryke 1995). Former Station Master's cottage – constructed between 1939 and 1940, now owned by TAHE and vacant. Lake George Mine – including the smelter site, and several related mining and processing sites (adjacent the site) Roscommon – miners hut constructed in the 19th century (near the site)		
Geology	Bumballa Formation comprising fine-grained sandstone interbedded with siltstone and mudstone, and Warbisco Shale comprising pyritic carbonaceous shale in the central portion. Captains Flat Shale and Kohinoor Volcanics (which includes rhyodacitic ignimbrite, agglomerate and minor argillaceous sediments) in the western portion.		
Hydrogeology	Based on local topography and geology, local groundwater is expected to flow in an east/northeast direction in line with Copper Creek towards the Molonglo River.		

Site Aspect	Summary
	The Hydrogeology Map of Australia database indicates the site is within a fractured
	or fissured aquifer with extensive aquifers of low to moderate productivity.
	The site appears mostly unsealed with rainfall expected to mostly infiltrate to
Direction of surface water	ground. During moderate to high rainfall events water could be expected to flow
runoff	overland, be received in rail cess drains (remnant from when the rail line was
	operational) and would likely to enter Copper Creek.
	The PSI (Ramboll, 2021a) stated that soils on the site to the west and east of the
	rail formation towards Copper Creek, comprised fill material containing coal and
	foreign materials including the observation of several fragments of fibre sheeting
Extent of fill	suspected of containing asbestos.
	Intrusive soil investigations completed as part of the previous DSI (Ramboll,
	2022b) determined that the site comprised up to 2 m of fill in most locations on-
	site.

4. Previous Results

The DSI (Ramboll, 2022) was completed to assess the level of contamination at and from the site in the context of ongoing commercial / industrial land use. The results of the DSI are summarised in the following subsections.

4.1 Soil Lithology

The site was underlain by less than 2 m of fill in most locations and shallow sandstone was encountered on the north-eastern portion of the site towards the end of the rail line. Shale and dacite were observed around the middle of the site and at the southern end of the site respectively.

The soil lithology within the corridor comprised:

- SLAG Ballast: GRAVEL with Silt and Sand: dark brown, dry, fine to medium grained gravel (slag). Encountered from the surface to 0.1 -0.2 metres below ground level (mbgl). It is considered likely that slag observed as ballast in the rail formation was a waste product from smelting that historically occurred at the Lake George mine.
- FILL: Sandy CLAY/Gravelly CLAY: dry, firm, high plasticity, with shale gravel and cobbles present. Encountered below the ballast layer to 0.4 to >2 mbgl.
- Sandy/Silty CLAY: Grey-brown, moist, low to medium plasticity (dry of plastic limit).
 Encountered below the fill layer ranging from 0.4 >2 mbgl.
- SANDSTONE / SHALE / DACITE. Rock types observed during drilling correlated with regional geology.

Green / grey staining indicative of ore spillage was observed around the former load-out / weigh bridge area and in shallow fill associated with the rail formation. Fibre cement sheeting fragments (ACM) were observed in rail formation fill from the Copper Creek culvert embankment north. These observations were consistent across surface soil assessment, test pitting and drilling.

Perched water was observed below the ballast layer in test pit TP16 at 0.5 mbgl perched above sandstone.

4.2 Soil Results

A summary of contaminant concentrations that exceeded adopted assessment criteria is summarised in **Table 4-1**.

Table 4-1: Summary of Soil Exceedances

Analyte	HIL C (mg/kg)	EIL/ESL Open Space (mg/kg)	Count	Minimum (mg/kg)	Maximum (mg/kg)	Average (mg/kg)	No > HIL	No > EIL
Arsenic	300	100	218	2.5	10305	296	38	67
Chromium	300	190	218	2.5	131	19	0	0
Copper	17000	220	218	2.5	5119	329	0	66
Iron			218	5.0	218530	35326		
Lead	600	1100	218	2.5	315567	6659	108	86
Nickel	1200	220	218	1.0	168	9	0	0
Zinc	30000	630	218	2.5	116599	2831	4	101
B(aP) ¹		20	10	0.25	1.2	0.345	0	0
TRH >C10- C16 less Naphthalene (F2)		170	10	25	280	87.6	0	2 ²

Includes data collected during the DSI (Ramboll, 2022) and ESA (Ramboll, 2021)

Samples from the SES Depot are included in the assessment against HIL D criteria in accordance with the tiered risk assessment approach recommended in the NEPM (NEPC 2013).

Asbestos was detected through sample analyses at three locations and was also observed as visible fragments in surface soils at multiple locations.

Lead, arsenic, and asbestos were identified as the primary drivers of potential risks to human health. Arsenic, copper, lead, and zinc were considered the primary drivers of potential risks to ecology.

Concentrations of Benzo(a)pyrene (B(a)P) were below the derived Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Canadian Council of Ministers of the Environment (CCME), 2010 (Residential/Parkland Land Use). One minor exceedance and one raised LOR for Total Recoverable Hydrocarbons (TRH) >C10-C16 less Naphthalene (F2) were reported. All other TRH concentrations were below the site criteria or below the LOR and the average concentration was below the ESL criteria, as such it is not considered to be a contaminant of concern.

¹Benzo(a)Pyrene ESL derived from Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Canadian Council of Ministers of the Environment (CCME), 2010 (Residential/Parkland Land Use).

² Raised LOR in one sample was above the ESL for F2.

5. Sampling and Analysis Quality Plan

5.1 Data Quality Objectives

Ramboll developed Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs) for the investigation in accordance with the seven-step DQO process, endorsed in Schedule B2 of the NEPM (2013). The DQOs set quality assurance and quality control parameters for the field and laboratory program to ensure data of appropriate reliability will be used to assess site contamination.

The DQOs are outline in **Table 5-1**. The performance of field and laboratory programs against DQIs is presented in **Section 8.1**.

Table 5-1: Data Quality Objectives

DQO	Outcome
Step 1: State the Problem	The problem is the lateral extent of soil contamination south and east of the SES compound and the vertical extent of soil contamination within and around the Copper Creek culvert embankments is not understood well enough to adequately to inform remediation.
Step 2: Identify the Decisions	 The following decisions are required: Is the data collected of sufficient quality to identify impacts to meet the project objectives? Do the results of the investigation provide understanding of the lateral and vertical extent of soil contamination? Can a conclusion be made on site suitability or are further investigations required?
Step 3: Identify Inputs to the Decision	 The following inputs to the decisions are required: Identification of sampling locations Visual or olfactory evidence of contamination Field portable X-ray Fluorescence (fpXRF) field screening of lead concentrations Laboratory analysis of soils for lead and co-located metals.
Step 4: Define the Study Boundaries	 The study boundaries for the addendum to the DSI are defined as follows: The physical boundaries of the investigation are the site boundary as defined in Figure 1, Appendix 1. The vertical extent is to a maximum depth of 10 mbgl for mechanically drilled boreholes¹, 3 mbgl for test pits and 0.5 mbgl for hand drilled boreholes noting that advancement at all locations will terminate on rock. Depth to rock has been previously observed at approximately two meters though is expected to be deeper beneath the Copper Creek culvert embankment. The temporal boundary is limited to data to be collected under this investigation. Investigations within the study boundary are limited by accessibility issues, including: The location of underground and overhead services The locations of structure on site (e.g. old load out equipment)
Step 5: Develop a Decision Rule	 If it is determined that the data generated through this investigation is reliable, complete, comparable, accurate and representative then this information will be used to address the assessment objectives. If it is determined that the data generated through this investigation is not suitable, comprehensive or reliable for use in achieving the goals of the study, then further investigations may be recommended to reduce uncertainties. If it is determined that insufficient information is available to make conclusions on the risk to ecological receptors, then further information may be required. If CoPC are reported above the assessment criteria, it will be considered whether further assessment or management measures are required.

¹10mbgl mechanically drilled boreholes are for geotechnical purposes only, not contamination sampling.

DQO	Outcome			
Step 6: Specify the Performance or Acceptance Criteria	Performance criteria are presented in the SAQP (Ramboll, 2024).			
Step 7: Optimise the Design for Obtaining Data			address the identified data gap presented on Figure 2 , Apper	
	Method of Advancement	No. Locations	Sample Depths (mbgl)	Analytes
	Soil Bore – solid flight auger	2	0 - 0.2 0.3 - 0.5 0.8 - 1 1.3 - 1.5 1.8 - 2 2.3 - 2.5 2.8 - 3 3.3 - 3.5 3.8 - 4	fpXRF field - measurement of lead
	Test pit	8	0 - 0.1 0.4 - 0.5 0.9 - 1 1.4 - 1.5 1.9 - 2.0 2.4 - 2.5 2.9 - 3	and laboratory analyses of As, Cr, Cu, Pb, Ni, Zn
	Hand excavation	14	0 – 0.1 0.4 – 0.5	

Assessment Criteria

The NEPM (2013) provides health-based soil investigation levels (HILs) and ecological investigation levels (EILs) for various land uses. Based on the current land use, the assessment criteria adopted for the Site that are relevant to addressing data gaps in the extent of soil contamination are:

- HIL C HIL for public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types and apply generally to a depth of 3 mbgl for residential use. Site-specific conditions should determine the depth to which HILs apply for other land uses.
- EIL for urban residential/public open space EILs depend on specific soil physio-chemical properties and generally apply to the top 2 m of soil. Site-specific EILs for public open space were calculated using pH and Cation Exchange Capacity results from samples collected onsite (Ramboll 2022) and will be adopted for this investigation.

Assessment criteria for this investigation are summarised in **Table 6-1**.

Table 6-1: Soil Assessment Criteria (mg/kg)

Contaminant	HIL C (public open space)	Site-specific EIL (urban residential/public open space) – Fill
Arsenic	300	160 ^b
Chromium	300°	190
Copper	17,000	220
Lead	600	1,100 ^b
Nickel	1,200	220
Zinc	30,000	630

⁻ Indicates no criteria available

^aHIL for chromium (VI)

^bThe EIL for these contaminants is generic, not site specific.

7. Fieldwork

Soil investigation works were completed 17 and 18 September 2024.

A Before You Dig Australia (BYDA) underground services check was completed prior to fieldwork. Sample locations were marked out and cleared by a suitably qualified and experienced locator.

Hand augers were advanced to a maximum depth of 0.5 mbgl. Where possible, samples were collected from soil that had less contact with the hand auger.

Test pits were advanced using a 15-tonne excavator with a 0.45 m wide toothed bucket to a maximum depth of 3.0 mbgl. Test pitting of the Copper Creek culvert embankment was limited by the steep surface gradient in this area. Samples were collected directly from the excavator bucket, from undisturbed materials in the centre of the bucket where practicable.

Samples were collected from each 0.1 m for the top fill layer, then every 0.5 m into natural soils or where different soil horizons where encountered. Samples were also collected where visual or olfactory evidence of potential contamination were observed.

FpXRF measurements were used as a field screening tool to inform sample collection and completed by a suitably experienced scientist holding a NSW EPA license required for field based XRF testing. Testing was completed in accordance with relevant provisions described in US EPA method 6200 (USEPA 2007).

FpXRF readings were taken using a ThermoFisher Scientific NitonTM XL3t fpXRF metal analyser. The instrument was set to soil mode and data was collected using 60 second dwell. The analyser uses a 50kV x-ray tube which provides sufficient flux to enable separation of spectra lines for highly accurate quantification of elements of interest.

The XRF was used ex-situ and measurements were taken by placing the XRF directly on the soil sample.

Readings were recorded digitally on the XRF unit and reported as a wet weight and not directly comparable with the dry weight guideline concentration. All soil samples were collected and sent to a laboratory for analysis.

A geotechnical assessment including drilling of three boreholes with no environmental sampling was conducted on 10 October 2024.

Sample locations for test pits and boreholes (excluding TP2) were recorded by a registered surveyor and a summary of the surveyed coordinates is included in **Appendix 7**. Sample locations for hand augers and TP2 were recorded using handheld GPS. All locations are presented on **Figure 2**, **Appendix 1**.

8. Quality Assurance and Quality Control

8.1 Field and Lab Quality Assurance and Quality Control

A quality assurance/quality control (QA/QC) assessment was completed for the field investigations is presented in **Table 8-1** and **Table 8-2**. The QA/QC assessment was made of data completeness, comparability, representativeness, precision and accuracy based on field and laboratory considerations, as outlined in the NEPM (NEPC, 2013) guidelines and considered the Data Quality Indicators (DQIs) and Data Quality Objectives (DQOs) as set out in the SAQP (Ramboll, 2024) and **Section 5.1**.

Table 8-1 QA/QC - Sampling and Analysis Methodology Assessment

Sampling Methodology	Ramboll Assessment
Sampling pattern and locations	A total of 14 hand augers, 6 test pits and 2 borehole sample locations were completed as part of the sampling program. The distribution of sample locations was in accordance with the approved SAQP for the works (Ramboll, 2024) therefore the number and distribution of sample locations is considered acceptable to meet the objectives outlined in Section 1 .
Sampling density	A total of 22 targeted soil sampling locations were completed during the investigation. A total of 61 primary soil were submitted for laboratory analysis for various metals and XRF measurements were performed on all samples. A provision for soil samples in the 2 boreholes was made in the SAQP (Ramboll, 2024). These were not collected due to the drilling contractor availability, however the test pit samples collected provide a sufficient basis for assessment of vertical extent and assessment of the vertical extent of contamination in the Copper Creek culvert embankments is considered adequate.
Decontamination procedures	Decontamination of reusable sampling equipment was completed using a solution of Alconox™ and deionised water. Dedicated nitrile gloves were used at each soil sampling location.
Sample handling and	Soil samples were collected in laboratory provided glass jars.
containers	Non-chemical-based ice which had been double-bagged (polyethylene plastic) and secured to avoid meltwater from contacting sample containers in the Esky during delivery to the analytical laboratory was used to cool the samples on route to the laboratory. No sample container breaches were noted in laboratory reports.
Chain of custody	Samples were transported to the laboratory under full chain of custody conditions. The chain of custody forms were signed by the laboratory upon receipt of the samples. All COCs for all lab reports received from the lab were checked to ensure that the correct samples were scheduled for analysis and the results received accordingly.
Sampling logs	Records of soil sample locations are included in the borehole logs provided in Appendix 6 . The test pit and borehole logs from the geotechnical assessment have been included in Appendix 6 .
Soil Screening	A fpXRF was used to screen soil samples in the field for the presence of metals to inform vertical extent of contamination. The fpXRF was XRF measurements indicated that elevated lead concentrations exceeded the targeted depth of the investigation. This infers some uncertainty as to the vertical extent of contamination in soil south east of the SES.

Table 8-2 QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Ramboll Assessment
Field quality control samples	Three intra-laboratory duplicate samples (split sample analysed by the same laboratory) and three inter-laboratory duplicate samples (split sample analysed by a different laboratory) were collected and analysed together with 61 primary samples at a rate of 10%.
	The duplicate samples were analysed for metals.
	Equipment rinsate blanks were collected during the fieldworks per day of work, resulting in two rinsate blanks. The rinsates were analysed for 8 metals, with all samples returning results of below LOR, indicating that decontamination procedures were effective.
Field quality control results	Relative percent difference (RPD) results for soil duplicate pairs were within acceptable limits with the exception of the following:
	 TP2_1.0 / D01_20240917 (duplicate): Arsenic (RPD = 45.2%), Cadmium (RPD = 30.5%), Copper (RPD = 37.8%), Lead (72.1%) and Zinc (RPD = 47.1%) TP2_1.0 / T01_20240917 (triplicate): Cadmium (RPD = 38.1%) and Chromium (RPD = 34.8%)
	 HA10_0.5 / D02_20240917 (duplicate): Arsenic (RPD = 50%) HA10_0.5 / T02_20240917 (triplicate): Lead (RPD = 41%) TP5_0.5 / D03_20240917 (duplicate): Chromium (RPD = 50%), Copper (RPD = 33%) and Lead (RPD = 58.2%) TP5_0.5 / T03_20240917 (triplicate): Arsenic (RPD = 48.15) Chromium (RPD = 38.7%), Copper (RPD = 46.8%), Lead (RPD = 46.4%), Nickel (RPD = 42.9%) and Zinc (57.4%)
	As the contaminant concentrations are generally exceed adopted assessment criteria by 5 - 10 times or greater, high RPDs do not infer data is of low quality. Soil samples collected are impacted by ore concentrate with exceptionally high contaminant concentrations. Primary samples define a widespread distribution of ore concentrate impact that is heterogeneous at local (small) scale. This is supported by high RPDs between primary and duplicate samples.
National Association of Testing Authorities (NATA) registered laboratory and NATA endorsed methods	Eurofins was used as the primary laboratory and ALS was used as the secondary laboratory. Eurofins and Envirolab laboratories are accredited by National Association of Testing Authorities, Australia (NATA) for the analyses performed for this assessment.
Analytical methods	A summary of analytical methods was included in the laboratory test certificates and the correct analytical methods were used.
Holding times	Review of the chain of custody forms and laboratory certificates indicate that holding times were met.
Limits of Reporting (LORs)	LORs for all analytes were below the adopted assessment criteria.
Laboratory quality control samples	Laboratory quality control samples including duplicates, matrix spikes, surrogate spikes and blanks were undertaken by the laboratories at appropriate frequencies.
Laboratory quality control results	All results for laboratory soil duplicates, laboratory control samples and surrogates were within acceptable limits, and no detections were made in blank samples with the following exceptions:

Field and Lab QA/QC	Ramboll Assessment
	 There were two fails in duplicates for cadmium, one fail in a duplicate for chromium and one fail in a duplicate for nickel for Eurofins where the RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of the relevant report.

8.2 Data Validation

An assessment of the data completeness, comparability, representativeness, precision and accuracy based on field and laboratory considerations, as outlined in NEPM (NEPC, 2013) guidelines is included in **Table 8-3**.

Table 8-3 QA/QC – Assessment of data validation

DQI	Ramboll Assessment				
Completeness	Completeness is a measure of whether all the data necessary to meet the project objectives was collected.				
	As noted in Table 8-1 , A total of 14 hand augers, 6 test pits and 2 soil bores sample locations were completed as part of the sampling program, with a total of 61 samples analysed for both laboratory and XRF. The number of primary samples was less than planned in the SAQP, due to maximum depths reached in sample locations, however this is not considered to have a significant effect on results, or the decisions being made on the basis of the available data. Therefore, the work satisfies the completeness requirement.				
Comparability	Comparability is a measure of confidence that the data may be considered to be equivalent for each sampling and analysis event.				
	The fieldwork was completed by experienced Ramboll personnel using standard operating procedures.				
	The laboratory analysis was undertaken by NATA registered laboratories using accredited analytical methods. Eurofins was chosen as the primary laboratory and ALS was chosen as the secondary laboratory.				
Representativeness	Representativeness is the confidence that the data is representative of each media present at the site.				
	In the field, representativeness was achieved by completing an adequate number of soil sampling points to characterise the targeted areas and materials on-site.				
Precision	Precision is a measure of the reproducibility of the data.				
	In the field, Ramboll achieved accuracy by using standard operating procedures for the collection of soil samples and by collecting duplicate and triplicate samples for analysis. As outlined in Table 8-2 RPD results for duplicate samples were acceptable.				
	At the laboratory, precision is assessed using blind replicate samples and split samples. As outlined in Table 8-2 results for laboratory duplicates were acceptable and no detections were made in blank samples.				
Accuracy	Accuracy is a measure of the closeness of a measurement to the true parameter value.				
	In the field, Ramboll achieved accuracy by using standard operating procedures for the collection of soil samples. Rinsate blanks were collected during the soil sampling programme and concentrations of COPC in all blank samples were below the LOR.				

DQI	Ramboll Assessment				
	At the laboratory, accuracy is assessed using laboratory control samples, matrix spikes, surrogates and blanks. All results for laboratory control samples, matrix spikes and surrogates were considered of no concern to the overall quality of the data and no detections were made in blank samples.				

Overall, the DQIs of completeness, comparability, representativeness, precision and accuracy have generally been met. It is considered that the data obtained adequately complied with the QA/QC assessment and that the data is of suitable quality to meet the project DQOs. Data Quality Objectives (DQOs) as set out in the SAQP (Ramboll 2024).

9. Results

9.1 Soil Lithology

The soil lithology for the two targeted areas is described below.

The generalised soil lithology of the copper creek culvert embankment targeted by the test pits comprised:

- FILL: Sandy Gravel dark brown to black, dry, medium to coarse grained sand, large angular gravels (ballast). Minor potential asbestos containing material (PACM) observed. Encountered from the surface to 0.5 mbgl.
- FILL: Silty/Sandy Clay with some gravels and shale: brown-black with orange mottling, moist, low to medium plasticity, coarse grained sand (black slag). Encountered from 0.5 to 3.0 mbgl.

The generalized soil lithology of the surrounding area of the SES Facility targeted by the hand augers comprised:

- FILL: Gravelly Sand with rootlets black/brown/orange, moist, fine grained sand, angular gravels. Minor potential asbestos containing material (PACM) observed. Encountered from the surface to 0.4 mbgl.
- FILL: Gravelly Clay: brown to orange, moist to wet, medium plasticity, angular gravels. Encountered from 0.4 0.5 mbgl.

9.2 Soil Results

A tabulated assessment of soil concentrations against adopted assessment criteria is presented as **Appendix 4**. A summary of laboratory analytical contaminant concentrations that exceeded adopted assessment criteria is summarised in **Table 9-1**.

Metals	Number of Samples	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	HIL C (mg/kg)	No > HIL C	EIL Public Open Space (mg/kg)	No > EIL Public Open Space
Arsenic	61	6	430	61.4	300	2	160	6
Copper	61	17	1,100	208.1	17,000	0	220	17
Lead	61	29	32,000	2,804.8	600	43	1,100	36
Zinc	61	75	31,000	2,811.1	30,000	1	630	39

Table 9-1: Summary of Laboratory Soil Exceedances

Lead, arsenic and zinc variably exceeded the health-based criteria. As the zinc is exceedance is minor and only occurred in one sample it is not considered to be a concern for human health. Lead, and arsenic are considered the primary drivers of potential risks to human health within the context of this investigation.

Arsenic concentrations, copper, lead and zinc concentrations variably exceeded the adopted ecological assessment criteria. Within this context arsenic, copper, lead and zinc are considered the primary drivers of potential risks to ecology.

The distribution of contaminant concentrations exceeding adopted assessment criteria protective of human health and ecology are described in **Section 9.2.1** and **Section 9.2.2** below.

9.2.1 Copper Creek Culvert Embankment Assessment

Figure 2 presents a summary of the distribution of contaminants exceeding adopted assessment criteria on site. The lateral distribution of lead in soils is described by shading and the vertical distribution of lead is described by sample results presented in summary tables on the figure for each test pit advanced.

The highest lead concentrations for the test pits on the Copper Creek Culvert Embankment were in the shallow soils (0 - 0.5 mbgl) on both sides of the rail line. fpXRF measurement of metals in test pits indicates lead exceedances are generally limited to the upper 0.5 mbgl within the rail formation.

Some potential asbestos fragments were observed in the surface soil around the Copper Creek culvert embankment consistent with previous observations (Ramboll, 2022).

9.2.2 Surrounding Area of the SES Facility Assessment

Concentrations of copper, lead and zinc were reported above assessment criteria at multiple hand auger locations surrounding the SES Facility. The distribution included exceedances nearby the rail formation and along the creek line down gradient of site. Topography sloping down to the unnamed creek on both sides supports conclusion that the distribution of soil contamination related to historic rail operations is limited to the land north and west of the unnamed creek.

Some potential asbestos fragments were observed in the surface soil adjacent the northern fence line of the SES.

10. Refined Conceptual Site Model

This CSM was developed for to assess exposure risks associated with soil contamination around the Copper Creek culvert and adjacent to the SES in the context of the public open space land use proposed in these areas. It should be read as a supplement to the CSM in DSI (Ramboll, 2022).

10.1 Environmental Setting

The site is zoned for use as a rail corridor (SP2 – Infrastructure) though is located within an area zoned RU1 Primary Production and local receiving waters (Copper Creek and then the Molonglo River) are understood to form part of a drinking water catchment (GHD 2018). The Palerang local environment plan (2014) indicates the site is located within the Googong Dam drinking water Catchment. The site is also located adjacent the Lake George (legacy) mine and so is within a highly disturbed area with known contaminant issues.

10.2 Sources of the Contaminant

The main source of site contamination was from site activities including the historic loading and transport of ore concentrate and application of slag as rail ballast.

10.3 Human and Ecological Receptors

Human receptors are considered to include:

- Onsite workers including rail workers maintaining existing and future assets and third party workers maintaining above ground and underground services passing through the site
- · Future recreational users of the Captains Flat Heritage Trail which passes through the site
- Users of the SES lease area.

Ecological receptors are considered to include onsite terrestrial ecology, Copper Creek as a tributary to the Molonglo River and bushland downstream from the site.

Previous assessment (GHD 2018) indicates contamination from the Lake George (legacy) mine has impacted the surrounding environment and the township of Captains Flat.

10.4 Exposure Pathways

For a receptor to be exposed to a contaminant derived from a site, there should be an exposure pathway linking the source of contamination and the exposed population. An exposure pathway describes the course a chemical or physical agent takes from the source to the exposed individual and generally includes the following elements (USEPA, 1989):

- A source and mechanism of chemical release
- A retention or transport medium (or media where chemicals are transferred between media)
- A point of potential human contact with the contaminated media and
- An exposure route (e.g., ingestion, inhalation) at the point of exposure.

An assessment of the SPR linkages for the contaminant onsite (including the former loadout complex) is summarised in **Table 10-1**.

Table 10-1: Exposure Assessment Summary

	Complete SPR? (Y / N / P)					
Exposure Route	Future recreational users of the heritage trail	Onsite workers	Onsite ecology	Offsite ecological receptors	Justification	
Soil						
Direct Contact	Υ	Υ	Υ	Υ	Lead concentrations in soil were observed above the adopted health and	
Inhalation	Υ	Υ	N/A	N/A	ecological criteria within the Copper Creek culvert embankment and adjacent the SES lease area. Vertical distribution of contamination within the	
Incidental Ingestion	Υ	Υ	N/A	N/A	culvert embankments appears to exceed 3 mbgl. Extent of soil contamination adjacent the SES extends to the unnamed creek. Some PACM was noted around the culvert	
Root Uptake	N/A	N/A	Υ	Υ	embankment (as previously noted) and additionally adjacent the SES.	

11. Site Characterisation

The additional investigation supports conclusion that lead contamination is concentrated in ballast of the rail formation and adjacent soils and presents risks to people who will use the site as a heritage walking trail. Offsite migration of lead appears to have occurred across the eastern site boundary around the loader at concentrations that may present a risk to human health. PACM was observed adjacent the SES as an addition to previously identified asbestos in and north of the Copper Creek culvert embankments. The additional data presented in this report refines assessment of the extent of soil remediation required to address contaminant exposure risks that limit site suitability for proposed public open space land use.

Risks to human health onsite including the SES lease area can be mitigated through maintenance of capping and implementation of the Captains Flat Rail Corridor EMP (Ramboll 2021b) until a long-term remedial strategy can be developed however this may not address offsite risks. Broadly the EMP comprises:

- · Maintenance of capping
- Fencing and signage to prevent inadvertent access
- · Controls to be implemented during earthworks
- Notification of SafeWork NSW of lead risk work prior to earthworks
- Communication of EMP requirements to site workers
- Discussion of contaminant distribution onsite

12. Conclusions and Recommendations

The key findings of this DSI addendum were:

• Contamination was identified onsite that is consistent with contamination associated with the historic transport of ore by rail.

Several potential human receptors were identified including:

- Onsite workers and workers maintaining above ground or underground services passing through the site
- Recreational users of the Captains Flat Heritage Trail which passes through the site

Potential ecological receptors were identified including on-site ecology, Copper Creek as a tributary to the Molonglo River and Bushland downgradient from the site. The Captains Flat Rail Corridor EMP (Ramboll 2021b) should continue to be implemented.

This addendum improves the site characterisation and extent of contamination, which will help inform an update to the RAP and further refine the extent of soil remediation proposed.

13. General Limitations and Reliance

This report has been prepared by Ramboll Australia Pty Ltd ("Ramboll") exclusively for the intended use by the client Transport Asset Holding Entity (TAHE) care of Transport for NSW (TfNSW) in accordance with the agreement (proposal reference number P115932, dated 6 December 2023 and PO 4200334631, dated 26 April 2024) between Ramboll and the client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties.

Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

Unless otherwise stated in this report, the scope of services, assessment and conclusions made assume that the site will continue to be used for its current purpose and end-use without significant changes either on-site or off-site.

The site investigation works identified in this report were undertaken during a discrete period of time. The findings and conclusions presented in this report are accordingly factually limited by these circumstances and, unless stated otherwise in the report, are preliminary. The field investigations were restricted to a level of detail necessary to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant period of time has elapsed since the sampling took place. The interpretation of the geological and environmental quality conditions is based on extrapolation from point-source data in a heterogeneous environment. Accordingly, more detailed investigation may be appropriate dependent upon the client objectives.

Unless stated otherwise, the geological information provided is for general environmental interpretation and should not be used for geotechnical and/or design purposes.

14. References

National Environment Protection Council (NEPC). National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013

NSW EPA, 2022. Sampling Design Guidelines: Contaminated Land Guidelines. (NSW EPA, 2022).

NSW EPA, 2020. Consultants reporting on contaminated land: Contaminated Land Guidelines. (NSW EPA, 2020).

Ramboll, 2021. Captains Flat Rail Corridor Preliminary Site Investigation. (Ramboll, 2021a)

Ramboll, 2022. Captains Flat Rail Corridor Detailed Site Investigation. (Ramboll, 2022b)

Ramboll, 2022. Captains Flat Rail Corridor Remediation Action Plan. (Ramboll, 2022a)

Ramboll, 2022. Captains Flat Rail Corridor Environmental Management Plan (Ramboll, 2022c)

Ramboll, 2022. Captains Flat Rail Corridor Remediation Options Assessment (Ramboll, 2022d).

Ramboll, 2024. Captains Flat Rail Corridor SAQP. (Ramboll, 2024)

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Appendix 1 Figures

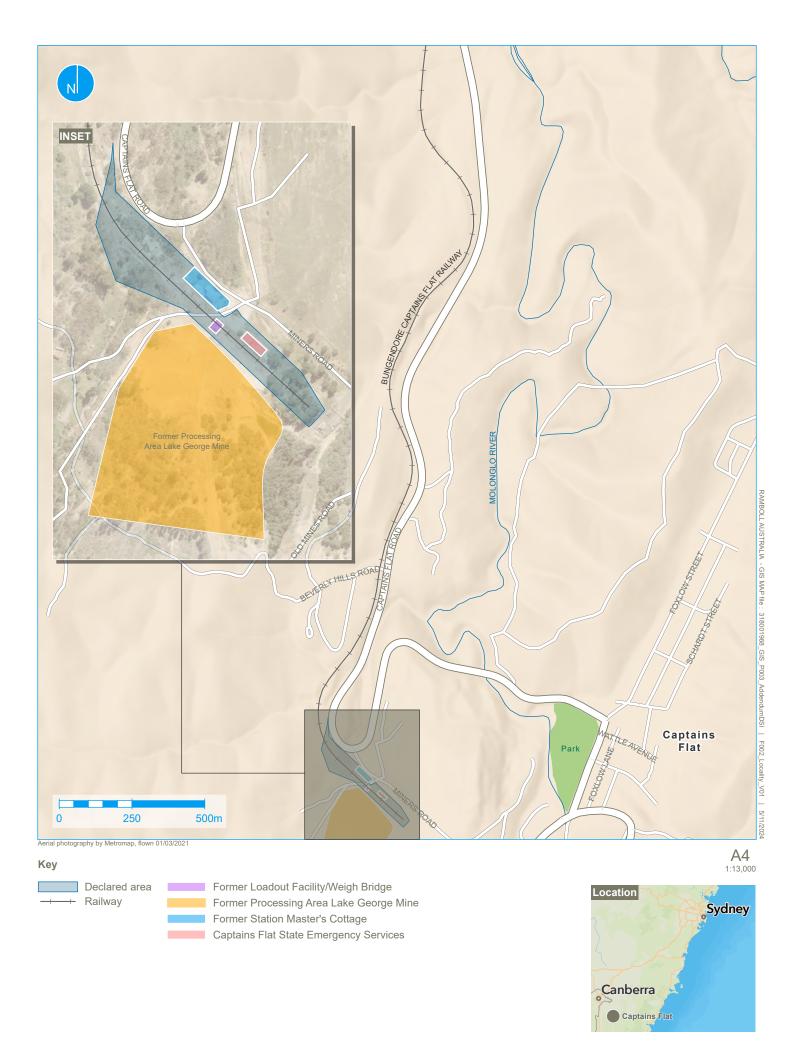
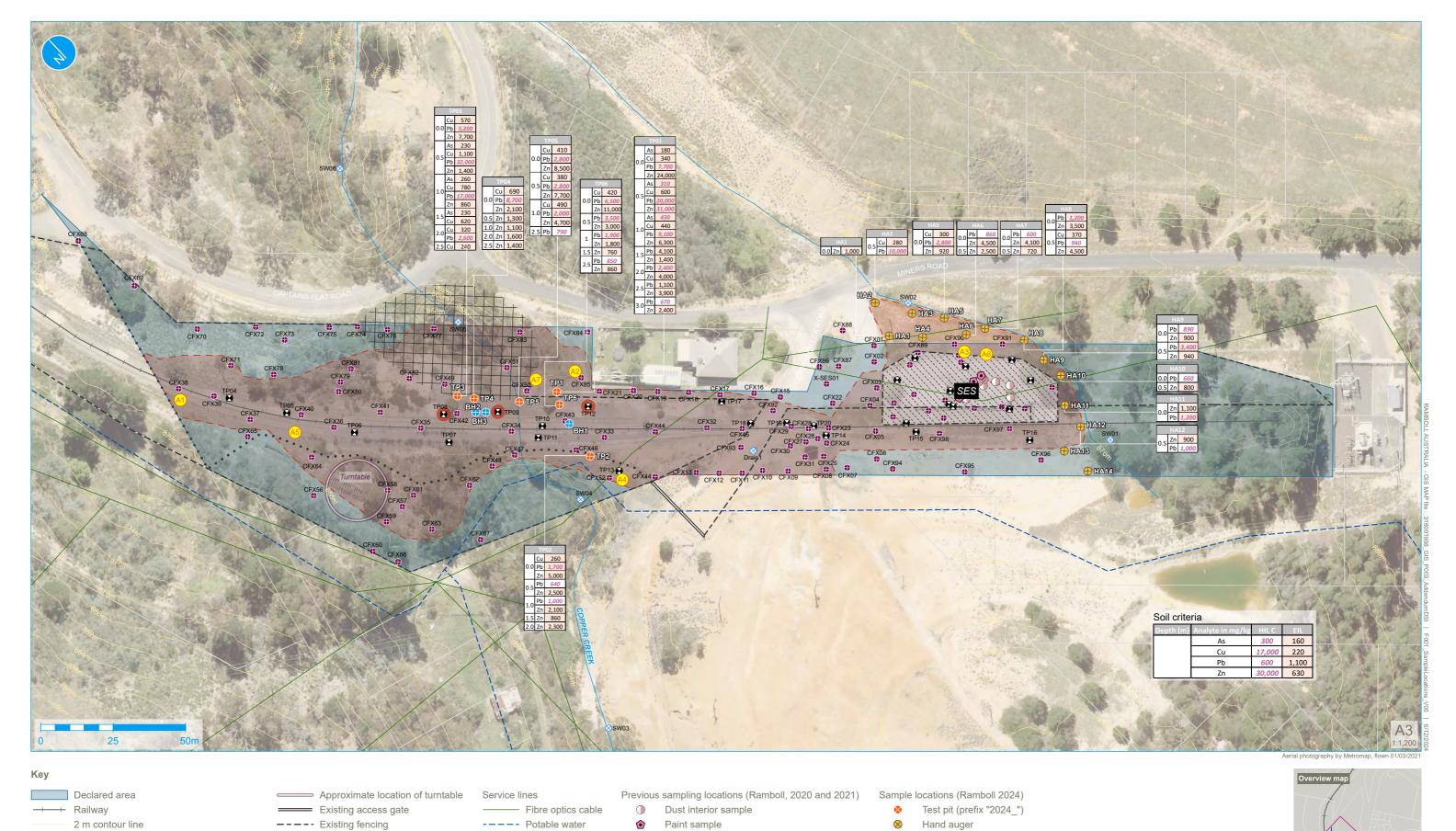


Figure 1 | Locality



Surface water sample

Asbestos identified

Test pit

XRF sample

Borehole

PACM (Sept 2024)

Data sourced from: Telstra, 2021. Queanbeyan Palerang Regional Council, 2021. Land and Property Information, 2018.



Figure 2 | Contaminant Exceedance Summary

• • • • Proposed fencing

XXX Steep dip

Captains Flat State Emergency Services

Extent of human health criteria

proposed to remediate human health risks

exceedance and area of excavation

Note: An indicative area of where exceedances to the human health criteria (HIL C) occurs is presented in this figure, for XRF sample result values refer to results table.

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Appendix 2 Photographic Log



1. Hand Auger Sample HA1 - Location

Photo taken 17 September 2024.



2. Hand Auger Sample HA1 - Location

Photo taken 17 September 2024.

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BCLL



3. Hand Auger Sample HA3 - Location

Photo taken 17 September 2024.



4. Hand Auger Sample HA3 - Location

Photo taken 17 September 2024.

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BCLL



5. Hand Auger Sample HA5 - Location

Photo taken 18 September 2024.



6. Hand Auger Sample HA6 - Location

Photo taken 18 September 2024.

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BCLL



7. Hand Auger Sample HA7 - Location



8. Hand Auger Sample HA8 - Location

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BCLL



9.Hand Auger Sample HA9 - Location



10.Hand Auger Sample HA10 - Location

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RA	MBCLL



11.Hand Auger Sample HA12 - Location



12. Test pit 1 (TP01) - Excavation

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RA	MBCLL



13. Test pit 1 (TP01) - Sample Piles



14. Test Pit 2 (TP02) - Excavation

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RA	MBCLL

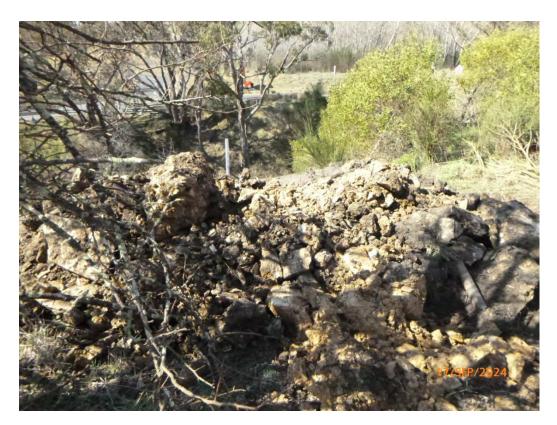


15. Test Pit 2 (TP02) - Sample Piles



16. Test Pit 3 (TP03) - Excavation

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BCLL



17. Test Pit 4 (TP04) - Excavation



18. Test Pit 5 (TP05) - Excavation

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BGLL



19. Test Pit 5 (TP05) - Sample Piles



20. Test Pit 6 (TP06) - Excavation

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BGLL



21. Test Pit 6 (TP06) - Excavation Pit



22. Test Pit 6 (TP06) - Excavation Pit

Client:	Transport Asset Holding Entity	Approved:	Project No.: 318001968	Date: September 2024
Site:	Captains Flat			
Title:	Captains Flat Rail Corridor Detailed Remediation Design		RAM	BCLL

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Appendix 3
EIL Calculations

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged
ACLs
Enter % clay (values from 0 to 100%)
1 Below needed to calculate fresh and aged
ABCs
71200
Measured background concentration
(mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method)
(values from 0 to 50%) to obtain estimate of
background concentration
1.5
or for aged ABCs only
or for agea 7.200 cm;
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs			
Land use	Cr III soil-specific EILs		
	(mg contaminant/kg dry soil)		
	Fresh	Aged	
National parks and areas of high conservation value	50	70	
Urban residential and open public spaces	100	190	
Commercial and industrial	150	320	

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
15
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.4
Enter organic carbon content (%OC) (values from 0 to 50%)
8.3
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 1.5
or for aged ABCs only
Enter State (or closest State)
NSW Enter traffic volume (high or low)
low

Outputs			
Land use	Cu soil-specific EILs		
	(mg contaminant	/kg dry soil)	
	Fresh	Aged	
National parks and areas of high conservation value	60	85	
Urban residential and open public spaces	110	220	
Commercial and industrial	160	310	

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
15
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
1.5
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Out	puts	
Land use	Ni soil-sp	ecific EILs
	(mg contaminant	/kg dry soil)
	Fresh	Aged
National parks and areas of high conservation value	20	40
Urban residential and open public spaces	75	220
Commercial and industrial	150	380

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
15
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.4
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration 1.5
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Out	puts	
Land use	Zn soil-sp	ecific EILs
	(mg contaminant	/kg dry soil)
	Fresh	Aged
National parks and areas of high conservation value	65	200
Urban residential and open public spaces	230	630
Commercial and industrial	350	930

Inputs
Select contaminant from list below
As
Below needed to calculate fresh and aged ACLs
Delegar and day appropriate freely and again
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs								
Land use	Arsenic ge	neric EILs						
	(mg contaminant	/kg dry soil)						
	Fresh	Aged						
National parks and areas of high conservation value	20	40						
Urban residential and open public spaces	50	100						
Commercial and industrial	80	160						

Out	puts	
Land use	Lead gen	eric EILs
	(mg contaminant	t/kg dry soil)
	Fresh	Aged
National parks and areas of high conservation value	110	470
Urban residential and open public spaces	270	1100
Commercial and industrial	440	1800

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Appendix 4 Analytical Summary Tables Client: Transport Asset Holding Entity Table 1: Job No:318001968

Analytical Results - Surrounding Area of SES Facility Project Name: Captains Flat Rail Corridor Detailed Remediation Design - Addendum to DSI



			Sample Typ	oe:	Soil											
			Lab Sample		S24-Se0052813	S24-Se0052814	S24-Se0052815	S24-Se0052816	S24-Se0052817	S24-Se0052818	S24-Se0052819	S24-Se0052820	S24-Se0052821	S24-Se0052822	S24-Se0052823	S24-Se0052824
		•	Sample ID:		HA1_0.0	HA1_0.5	HA2_0.0	HA2_0.5	HA3_0.0	HA3_0.5	HA4_0.0	HA4_0.5	HA5_0.0	HA5_0.5	HA6_0.0	HA6_0.5
	HIL C Public Open Space	EIL Residential	Sample dat	te:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
	орен орасс	Residential	Project Nai	me:	Captains Flat											
			Sampling N	/lethod:	GRAB											
Analyte grouping/Analyte			Units	LOR												
			11													
Moisture Content																_
Moisture Content	-	-	%	1	4.2	9.9	16	24	14	16	13	16	57	22	24	15
Heavy Metals																
Arsenic	300	160	mg/kg	2	13	13	15	71	19	8	7	10	59	6	45	71
Cadmium	90	-	mg/kg	0.4	1	< 0.4	< 0.4	1	< 0.4	< 0.4	2	1	4	1	16	1
Chromium	300	190	mg/kg	5	15	16	12	< 5	10	10	11	15	13	13	27	13
Copper	17,000	220	mg/kg	5	60	17	60	280	64	28	26	19	300	32	180	160
Lead	600	1,100	mg/kg	5	240	100	400	10000	430	61	150	97	2800	56	860	2500
Nickel	1,200	220	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	5	< 5	< 5	8	< 5
Zinc	30,000	630	mg/kg	5	1000	110	180	500	86	150	380	370	920	280	4500	530

Blank Cell indicates no criterion available

LOR = Limit of Reporting

4/11/2024

<value = Less than the laboratory Limit of Reporting (LOR)

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

Analytical Results - Surrounding Area of SES Facility



			Sample Type	:	Soil												
			Lab Sample N	Number	S24-Se0052825	S24-Se0052826	S24-Se0052827	S24-Se0052828	S24-Se0052829	S24-Se0052830	S24-Se0052831	S24-Se0052832	S24-Se0052833	S24-Se0052834	S24-Se0052835	S24-Se0052836	S24-Se0052837
	NEPM 2013 HIL C Public	Site Specific EIL	Sample ID:		HA7_0.0	HA7_0.5	HA8_0.0	HA8_0.5	HA9_0.0	HA9_0.5	HA10_0.0	HA10_0.5	HA11_0.0	HA12_0.0	HA12_0.5	HA13_0.0	HA14_0.0
	Open Space	Residential	Sample date:	:	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
	— орен ориос	Residential	Project Name	e:	Captains Flat												
			Sampling Me	thod:	GRAB												
Analyte grouping/Analyte			Units	LOR													
Moisture Content																	
Moisture Content	-	-	%	1	62	14	16	18	15	23	23	27	46	10	19	12	6.3
Heavy Metals																	
Arsenic	300	160	mg/kg	2	31	32	45	33	34	150	23	7	23	17	26	9	160
Cadmium	90	-	mg/kg	0.4	20	3	16	15	4	2	1	1	2	1	4	1	< 0.4
Chromium	300	190	mg/kg	5	8	21	28	14	13	6	13	19	26	10	11	6	7
Copper	17,000	220	mg/kg	5	150	34	140	370	130	140	92	66	130	46	120	63	55
Lead	600	1,100	mg/kg	5	600	160	1200	940	890	3400	660	97	1100	250	900	180	280
Nickel	1,200	220	mg/kg	5	9	< 5	9	12	16	< 5	< 5	7	18	< 5	< 5	< 5	< 5
Zinc	30,000	630	mg/kg	5	4100	720	3500	4500	900	940	380	800	1200	450	1000	180	86

Blank Cell indicates no criterion available

LOR = Limit of Reporting

4/11/2024

<value = Less than the laboratory Limit of Reporting (LOR)

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI) Concentrations in green box exceed adopted HIL C for Public Open Space

. Confidential

RAMBOLL

			Sample Ty	pe:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Lab Sampl	le Number	S24-Se0052813	S24-Se0052814	S24-Se0052815	S24-Se0052816	S24-Se0052817	S24-Se0052818	S24-Se0052819	S24-Se0052820	S24-Se0052821	S24-Se0052822	S24-Se0052823	S24-Se0052824
		Site Specific	Sample ID):	HA1_0.0	HA1_0.5	HA2_0.0	HA2_0.5	HA3_0.0	HA3_0.5	HA4_0.0	HA4_0.5	HA5_0.0	HA5_0.5	HA6_0.0	HA6_0.5
	HIL C Public Open Space	EIL Residential	Sample da	ite:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
	Open Space	Residential	Project Na	ime:	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat
			Sampling I	Method:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
			-							-						
Analyte grouping/Analyte			Units	LOR												-
Moisure Content																
Moisure Content	-	-	%	1	4.2	9.9	16	24	14	16	13	16	57	22	24	15
																Τ
Heavy Metals																
Arsenic	300	160	mg/kg	2	<lod< td=""><td><lod< td=""><td><lod< td=""><td>200</td><td><lod< td=""><td>8</td><td><lod< td=""><td>13</td><td><lod< td=""><td><lod< td=""><td>29</td><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td>200</td><td><lod< td=""><td>8</td><td><lod< td=""><td>13</td><td><lod< td=""><td><lod< td=""><td>29</td><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td>200</td><td><lod< td=""><td>8</td><td><lod< td=""><td>13</td><td><lod< td=""><td><lod< td=""><td>29</td><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	200	<lod< td=""><td>8</td><td><lod< td=""><td>13</td><td><lod< td=""><td><lod< td=""><td>29</td><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	8	<lod< td=""><td>13</td><td><lod< td=""><td><lod< td=""><td>29</td><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<>	13	<lod< td=""><td><lod< td=""><td>29</td><td><lod< td=""></lod<></td></lod<></td></lod<>	<lod< td=""><td>29</td><td><lod< td=""></lod<></td></lod<>	29	<lod< td=""></lod<>
Cadmium	90	-	mg/kg	0.4	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	300	190	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-
Copper	17,000	220	mg/kg	5	<lod< td=""><td>47</td><td>73</td><td>223</td><td>99</td><td>23</td><td>56</td><td>67</td><td>34</td><td>40</td><td>146</td><td>142</td></lod<>	47	73	223	99	23	56	67	34	40	146	142
Lead	600	1,100	mg/kg	5	<lod< td=""><td>60</td><td>280</td><td>7224</td><td>1589</td><td>46</td><td>144</td><td>117</td><td>195</td><td>36</td><td>374</td><td>2581</td></lod<>	60	280	7224	1589	46	144	117	195	36	374	2581
Nickel	1,200	220	mg/kg	5	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<>	<lod< td=""></lod<>
Zinc	30,000	630	mg/kg	5	550	13	19	21	14	10	20	20	11	14	47	20

Blank Cell indicates no criterion available

LOR = Limit of Reporting

LOD = Limit of Detection

4/11/2024

Not analysed / Not calculated

<value = Less than the Limit of Detection (LOD)

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

Table 2: fpXRF Results - Surrounding Area of SES Facility

					٠.	
R	Δ	М	В	O		
			_	$\overline{}$		_

			Sample Type	e:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Lab Sample	Number	S24-Se0052825	S24-Se0052826	S24-Se0052827	S24-Se0052828	S24-Se0052829	S24-Se0052830	S24-Se0052831	S24-Se0052832	S24-Se0052833	S24-Se0052834	S24-Se0052835	S24-Se0052836	S24-Se0052837
	NEPM 2013 HIL C Public	Site Specific	Sample ID:		HA7_0.0	HA7_0.5	HA8_0.0	HA8_0.5	HA9_0.0	HA9_0.5	HA10_0.0	HA10_0.5	HA11_0.0	HA12_0.0	HA12_0.5	HA13_0.0	HA14_0.0
	Open Space	EIL Residential	Sample date	e:	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
	Open Space	Residential	Project Nam	ne:	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat
			Sampling Me	ethod:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
	•	•	•		•										•		
Analyte grouping/Analyte			Units	LOR													
Moisure Content																	
Moisure Content	-	-	%	1	62	14	16	18	15	23	23	27	46	10	19	12	6.3
Heavy Metals																	
Arsenic	300	160	mg/kg	2	15	<lod< td=""><td><lod< td=""><td>77</td><td>42</td><td>54</td><td>11</td><td><lod< td=""><td>14</td><td><lod< td=""><td><lod< td=""><td><lod< td=""><td>111</td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td>77</td><td>42</td><td>54</td><td>11</td><td><lod< td=""><td>14</td><td><lod< td=""><td><lod< td=""><td><lod< td=""><td>111</td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	77	42	54	11	<lod< td=""><td>14</td><td><lod< td=""><td><lod< td=""><td><lod< td=""><td>111</td></lod<></td></lod<></td></lod<></td></lod<>	14	<lod< td=""><td><lod< td=""><td><lod< td=""><td>111</td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td>111</td></lod<></td></lod<>	<lod< td=""><td>111</td></lod<>	111
Cadmium	90	-	mg/kg	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	300	190	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	17,000	220	mg/kg	5	62	50	81	195	149	111	41	73	55	68	60	54	51
Lead	600	1,100	mg/kg	5	112	42	296	733	694	1138	129	73	326	254	218	116	209
Nickel	1,200	220	mg/kg	5	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<>	<lod< td=""></lod<>
Zinc	30,000	630	mg/kg	5	20	24	29	39	37	42	9	18	29	17	23	11	11

Blank Cell indicates no criterion available

LOR = Limit of Reporting

4/11/2024

LOD = Limit of Detection

- Not analysed / Not calculated

<value = Less than the Limit of Detection (LOD)

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

Client: Transport Asset Holding Entity
Job No:318001968
Analytical Results - Copper Creek Culvert Embankment
Project Name: Captains Flat Rail Corridor Detailed Remediation Design - Addendum to DSI



			Sample Typ	e:	Soil											
			Lab Sample		S24-Se0052838	S24-Se0052839	S24-Se0052840	S24-Se0052841	S24-Se0052842	S24-Se0052843	S24-Se0052844	S24-Se0052845	S24-Se0052846	S24-Se0052847	S24-Se0052848	S24-Se0052849
		Site Specific	Sample ID:		TP1_0.0	TP1_0.5	TP1_1.0	TP1_1.5	TP1_2.0	TP1_2.5	TP1_3.0	TP2_0.0	TP2_0.5	TP2_1.0	TP2_1.5	TP2_2.0
	HIL C Public Open Space	EIL Public Open Space	Sample dat	e:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024
	Орен орасс	Орен эрасс	Project Nan	ne:	Captains Flat											
			Sampling M	lethod:	GRAB											
Analyte grouping/Analyte			Units	LOR												
Moisure Content																
Moisure Content	-	-	%	1	12	13	18	17	17	17	18	13	12	12	13	12
Heavy Metals											L					
Arsenic	300	160	mg/kg	2	180	310	430	120	100	36	35	28	12	19	14	25
Cadmium	90	-	mg/kg	0.4	26	64	14	3	9	8	6	4	2	3	2	2
Chromium	300	190	mg/kg	5	9	13	12	17	16	12	16	28	17	19	18	28
Copper	17,000	220	mg/kg	5	340	600	440	140	150	87	72	260	150	220	170	220
Lead	600	1,100	mg/kg	5	7700	20000	9100	4100	2400	1100	670	1700	640	1000	480	490
Nickel	1,200	220	mg/kg	5	8	9	8	6	9	6	5	11	12	12	13	14
Zinc	30,000	630	mg/kg	5	24000	31000	6300	1400	4100	3900	2400	5000	2500	2100	860	2300

Blank Cell indicates no criterion available

LOR = Limit of Reporting

4/11/2024

<value = Less than the laboratory Limit of Reporting (LOR)

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

Client: Transport Asset Holding Entity
Job No:318001968
Analytical Results - Copper Creek Culvert Embankment
Project Name: Captains Flat Rail Corridor Detailed Remediation Design - Addendum to DSI

RAMBOLL

			Sample Ty	pe:	Soil												
			Lab Sample	e Number	S24-Se0052850	S24-Se0052851	S24-Se0052852	S24-Se0052853	S24-Se0052854	S24-Se0052855	S24-Se0052856	S24-Se0052857	S24-Se0052858	S24-Se0052859	S24-Se0052860	S24-Se0052861	S24-Se0052862
		Site Specific EIL Public	Sample ID	:	TP3_0.0	TP3_0.5	TP3_1.0	TP3_1.5	TP3_2.0	TP3_2.5	TP4_0.0	TP4_0.5	TP4_1.0	TP4_1.5	TP4_2.0	TP5_0.0	TP5_0.5
	Open Space		Sample da	te:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024
	Орен орисс	Орен орасс	Project Na	me:	Captains Flat												
			Sampling N	Method:	GRAB												
Analyte grouping/Analyte			Units	LOR													
Moisure Content																	
Moisure Content	-	-	%	1	7.4	13	16	17	18	16	11	15	13	21	11	17	17
Heavy Metals																	
Arsenic	300	160	mg/kg	2	61	230	260	230	81	37	69	19	8	7	12	37	49
Cadmium	90	-	mg/kg	0.4	24	3	2	< 0.4	< 0.4	< 0.4	7	4	3	3	4	24	27
Chromium	300	190	mg/kg	5	27	8	9	7	13	10	42	10	8	8	8	26	50
Copper	17,000	220	mg/kg	5	570	1100	780	220	320	240	690	170	210	89	160	410	380
Lead	600	1,100	mg/kg	5	5200	32000	17000	620	2600	400	8700	520	290	30	350	2800	2800
Nickel	1,200	220	mg/kg	5	27	6	7	< 5	8	5	26	12	8	6	12	24	33
Zinc	30,000	630	mg/kg	5	7700	1400	860	170	210	200	2100	1300	1100	1600	1400	8500	7700

Blank Cell indicates no criterion available

LOR = Limit of Reporting

4/11/2024

<value = Less than the laboratory Limit of Reporting (LOR)

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

Client: Transport Asset Holding Entity Table 3: Analytical Results - Copper Creek Culvert Embankment Job No:318001968 Project Name: Captains Flat Rail Corridor Detailed Remediation Design - Addendum to DSI

< 5



			Sample Ty	pe:	Soil										
			Lab Sampl	e Number	S24-Se0052863	S24-Se0052864	S24-Se0052865	S24-Se0052866	S24-Se0052867	S24-Se0052868	S24-Se0052869	S24-Se0052870	S24-Se0052871	S24-Se0052872	S24-Se0052873
		Site Specific	Sample ID	:	TP5_1.0	TP5_1.5	TP5_2.0	TP5_2.5	TP6_0.0	TP6_0.5	TP6_1.0	TP6_1.5	TP6_2.0	TP6_2.5	TP6_3.0
	HIL C Public Open Space		Sample da	te:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024
	Орен орасс	open opace	Project Na	me:	Captains Flat										
			Sampling I	Method:	GRAB										
	•	•	•			•	•								
Analyte grouping/Analyte			Units	LOR											
Moisure Content															
Moisure Content	-	-	%	1	14	16	14	15	12	13	13	16	16	16	15
Heavy Metals															
Arsenic	300	160	mg/kg	2	37	30	14	33	110	53	47	27	16	29	14
Cadmium	90	-	mg/kg	0.4	15	< 0.4	< 0.4	1	17	8	6	3	1	4	3
Chromium	300	190	mg/kg	5	14	12	19	17	11	17	16	14	13	14	13
Copper	17,000	220	mg/kg	5	490	37	32	75	420	180	120	66	86	100	140
Lead	600	1,100	mg/kg	5	2000	440	29	790	9500	3500	1900	590	300	850	150
Nickel	1 200	220	ma/ka	E	1.4	, E	0	0	7	0	10	7		7	. 5

< 5

< 5

Blank Cell indicates no criterion available

LOR = Limit of Reporting

Copper Lead Nickel

4/11/2024

<value = Less than the laboratory Limit of Reporting (LOR)

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

1,200

30,000

mg/kg mg/kg

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space



			Sample Typ	De:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Lab Sample		S24-Se0052838	S24-Se0052839	S24-Se0052840	S24-Se0052841	S24-Se0052842	S24-Se0052843	S24-Se0052844	S24-Se0052845	S24-Se0052846	S24-Se0052847	S24-Se0052848	S24-Se0052849	S24-Se0052850
	NEPM 2013	=	Sample ID:		TP1_0.0	TP1_0.5	TP1_1.0	TP1_1.5	TP1_2.0	TP1_2.5	TP1_3.0	TP2_0.0	TP2_0.5	TP2_1.0	TP2_1.5	TP2_2.0	TP3_0.0
	HIL C Public Open Space	EIL Residential	Sample dat	te:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024
	Open Space	Residential	Project Nar	me:	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat
			Sampling M	/lethod:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Analyte grouping/Analyte			Units	LOR													
Moisure Content																	
Moisure Content	-	-	%	1													
Heavy Metals																	
Arsenic	300	160	mg/kg	2	402	351	166	201	177	256	16	71	48	62	<lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<>	<lod< td=""></lod<>
Cadmium	90	-	mg/kg	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	300	190	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	17,000	220	mg/kg	5	277	539	136	177	158	178	48	172	169	192	109	122	360
Lead	600	1,100	mg/kg	5	4084	5065	1396	2454	1449	1868	83	607	810	551	88	167	2099
Nickel	1,200	220	mg/kg	5	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<>	<lod< td=""></lod<>
Zinc	30,000	630	mg/kg	5	12150	16472	2339	1674	4125	5432	783	1473	1630	1297	396	583	3752

Blank Cell indicates no criterion available
<value = Less than the Limit of Detection (LOD)
- Not analysed / Not calculated

LOR = Limit of Reporting LOD = Limit of Detection

4/11/2024

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

Table 4: fpXRF Results - Copper Creek Culvert Embankment



			Sample Typ	e:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Lab Sample	Number	S24-Se0052851	S24-Se0052852	S24-Se0052853	S24-Se0052854	S24-Se0052855	S24-Se0052856	S24-Se0052857	S24-Se0052858	S24-Se0052859	S24-Se0052860	S24-Se0052861	S24-Se0052862
		<u> </u>	Sample ID:		TP3_0.5	TP3_1.0	TP3_1.5	TP3_2.0	TP3_2.5	TP4_0.0	TP4_0.5	TP4_1.0	TP4_1.5	TP4_2.0	TP5_0.0	TP5_0.5
	HIL C Public Open Space	EIL Residential	Sample date	e:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024
	open opass	Itooidontidi	Project Nan	ne:	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat	Captains Flat
			Sampling M	lethod:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Analyte grouping/Analyte			Units	LOR												
Moisure Content																
Moisure Content	-	-	%	1												
Heavy Metals																
Arsenic	300	160	mg/kg	2	850	277	112	345	32	339	<lod< td=""><td><lod< td=""><td><lod< td=""><td>19</td><td>157</td><td>40</td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td>19</td><td>157</td><td>40</td></lod<></td></lod<>	<lod< td=""><td>19</td><td>157</td><td>40</td></lod<>	19	157	40
Cadmium	90	-	mg/kg	0.4	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	300	190	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-
Copper	17,000	220	mg/kg	5	580	566	173	263	143	590	141	159	56	142	432	238
Lead	600	1,100	mg/kg	5	9029	7250	455	2362	356	5162	257	284	22	145	2707	1029
Nickel	1,200	220	mg/kg	5	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<>	<lod< td=""></lod<>
Zinc	30,000	630	mg/kg	5	770	590	148	213	150	1640	454	904	1153	850	7634	6398

Blank Cell indicates no criterion available
<value = Less than the Limit of Detection (LOD)
- Not analysed / Not calculated
LOR = Limit of Reporting
LOD = Limit of Detection

4/11/2024

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

RAMBOLL

		Sample Type:	Soil										
		Lab Sample Number	S24-Se0052863	S24-Se0052864	S24-Se0052865	S24-Se0052866	S24-Se0052867	S24-Se0052868	S24-Se0052869	S24-Se0052870	S24-Se0052871	S24-Se0052872	S24-Se0052873
NEPM 2013	Site Specific	Sample ID:	TP5_1.0	TP5_1.5	TP5_2.0	TP5_2.5	TP6_0.0	TP6_0.5	TP6_1.0	TP6_1.5	TP6_2.0	TP6_2.5	TP6_3.0
HIL C Public Open Space	EIL	Sample date:	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024	17/09/2024
open opase	Residential	Project Name:	Captains Flat										
		Sampling Method:	GRAB										

Analyte grouping/Analyte Units LOR

Moisure Content															
Moisure Content	-	-	%	1											
Heavy Metals															
Arsenic	300	160	mg/kg	2	159	16	<lod< td=""><td>17</td><td>525</td><td>110</td><td>207</td><td>71</td><td><lod< td=""><td>37</td><td>78</td></lod<></td></lod<>	17	525	110	207	71	<lod< td=""><td>37</td><td>78</td></lod<>	37	78
Cadmium	90	-	mg/kg	0.4	-	-	-	-	-	-	-	-	-	-	-
Chromium	300	190	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-
Copper	17,000	220	mg/kg	5	459	36	85	58	547	162	170	203	80	98	125
Lead	600	1,100	mg/kg	5	1938	47	28	71	8119	1856	1571	1300	130	495	482
Nickel	1,200	220	mg/kg	5	<lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""><td><lod< td=""></lod<></td></lod<></td></lod<>	<lod< td=""><td><lod< td=""></lod<></td></lod<>	<lod< td=""></lod<>
Zinc	30,000	630	mg/kg	5	6303	131	70	90	3797	3277	1487	1824	193	634	556

Blank Cell indicates no criterion available <value = Less than the Limit of Detection (LOD)

Not analysed / Not calculatedLOR = Limit of Reporting

LOD = Limit of Detection

4/11/2024

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site

Contamination) Amendment Measure 2013 (No. 1) (NEPM).

Health Investigation Levels for chromium based on chromium (VI)

Concentrations in green box exceed adopted HIL C for Public Open Space

Client: Transport Asset Holding Entity Table 5: QA/QC - Relative Percent Differences Job No: 318001968

Project Name: Captains Flat Rail Corridor Detailed Remediation Design - Addendum to DSI 4/11/2024

RAMBOLL

			11								
	Sample Type:		Soil	Soil		Soil	Soil		Soil	Soil	_
	Lab Sample num	ber:	S24-Se0052847	S24-Se0052874		S24-Se0052847	ES2431034001		S24-Se0052832	S24-Se0052875	
	Sample date:		17/09/2024	17/09/2024	RPD	17/09/2024	17/09/2024	RPD	18/09/2024	18/09/2024	RPD
	Sample ID:		TP2_1.0	D01_20240917	RPD	TP2_1.0	T01_20240917	T RPD	HA10_0.5	D02_20240917] KPD
	Sampling Method	d:	Grab	Grab		Grab	Grab]	Grab	Grab	_]
	Sample Descript	ion:	PRIMARY	Duplicate		PRIMARY	Duplicate		PRIMARY	Duplicate	1
Analyte grouping/Analyte	Units	LOR	<u> </u>								+
Analyte grouping/Analyte	Units	LOR	 						+	+	
			1								
EG005(ED093)T: Total Metals by ICP-AES	•						•				
Arsenic	mg/kg	5	19	12	45.2	19	22	14.6	6.6	11	50.0
Cadmium	mg/kg	1	3.4	2.5	30.5	3.4	5	38.1	1.4	1.2	15.4
Chromium	mg/kg	2	19	16	17.1	19	27	34.8	19	17	11.1
Copper	mg/kg	5	220	150	37.8	220	247	11.6	66	53	21.8
Lead	mg/kg	5	1000	470	72.1	1000	835	18.0	97	120	21.2
Nickel	mg/kg	2	12	9.4	24.3	12	12	0.0	7.1	5.6	23.6
Zinc	mg/kg	5	2100	1300	47.1	2100	1620	25.8	800	670	17.7

LOR = Limit of Reporting

<value = Less than the laboratory Limit of Reporting (LOR)

Bold and Shaded cells exceed RPD > 30%

Bold indicates when above the acceptance criteria for Trip

Spikes/Blanks and Rinsates nc = not calculated as one or more results are below the LOR.

11 of 13

Client: Transport Asset Holding Entity Table 5: Job No: 318001968

QA/QC - Relative Percent Differences Project Name: Captains Flat Rail Corridor Detailed Remediation Design - Addendum to DSI 4/11/2024

RAMBOLL

	Sample Type:		Soil	Soil		Soil	Soil		Soil	Soil	
	Lab Sample numb	oer:	S24-Se0052832	ES2431034002		S24-Se0052862	S24-Se0052876		S24-Se0052862	ES2431034003	
	Sample date:		18/09/2024	18/09/2024	DDD	17/09/2024	17/09/2024	RPD	17/09/2024	17/09/2024	
	Sample ID:		HA10_0.5	T02_20240917	RPD	TP5_0.5	D03_20240917	RPD	TP5_0.5	T03_20240917	RPD
	Sampling Method	:	Grab	Grab		Grab	Grab		Grab	Grab	
	Sample Descripti	on:	PRIMARY	Triplicate		PRIMARY	Duplicate		PRIMARY	Triplicate	
Analyte grouping/Analyte	Units	LOR									
EG005(ED093)T: Total Metals by ICP-AES											
Arsenic	mg/kg	5	6.6	8	19.2	49	58	16.8	49	80	48.1
Cadmium	mg/kg	1	1.4	<1		27	26	3.8	27	36	28.6
Chromium	mg/kg	2	19	17	11.1	50	30	50.0	50	74	38.7
Copper	mg/kg	5	66	67	1.5	380	530	33.0	380	612	46.8
Lead	mg/kg	5	97	147	41.0	2800	5100	58.2	2800	4490	46.4
Nickel	mg/kg	2	7.1	6	16.8	33	26	23.7	33	51	42.9
Zinc	mg/kg	5	800	755	5.8	7700	9400	19.9	7700	13900	57.4

LOR = Limit of Reporting

<value = Less than the laboratory Limit of Reporting (LOR)

Bold and Shaded cells exceed RPD > 30%

Bold indicates when above the acceptance criteria for Trip

Spikes/Blanks and Rinsates

nc = not calculated as one or more results are below the LOR.

12 of 13

Client: Transport Asset Holding Entity

Job No:318001968

Project Name: Captains Flat Rail Corridor Detailed Remediation Design - Addendum to DSI

4/11/2024

Sample Type:	Soil	Soil
Lab Sample Number	S24-Se0052877	S24-Se0052878
Sample ID:	R01_20240917	R02_20240918
Sample date:	17/09/2024	18/09/2024
Project Name:	Captains Flat	Captains Flat
Sampling Method:	GRAB	GRAB

Analyte grouping/Analyte	Units	LOR		
Heavy Metals				
Arsenic	mg/L	0.001	< 0.001	< 0.001
Cadmium	mg/L	0.0002	< 0.0002	< 0.0002
Chromium	mg/L	0.001	< 0.001	< 0.001
Copper	mg/L	0.001	< 0.001	< 0.001
Lead	mg/L	0.001	< 0.001	< 0.001
Nickel	mg/L	0.001	< 0.001	< 0.001
Zinc	mg/L	0.005	< 0.005	< 0.005

Blank Cell indicates no criterion available

<value = Less than the laboratory Limit of Reporting (LOR)</pre>

mg/L = milligrams per litre

LOD = Limit of Detection

National Environment Protection Council (2013) National Environmental

Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.

Health Investigation Levels for chromium based on chromium (VI)

Table 6: QA/QC - Rinsates



Confidential

Ramboll

Appendix 5 Laboratory Reports

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CHAIN OF CUSTODY RECORD

Eurofins | Environment Teeting ABN 50 005 085 521

Unit F3 Bid.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
6 Moniterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Ramboll		Projec	ct Nº	318	001968					Project	t Manager	Step	hen Max	well					Sampl	er(s)		Sam	Buckle	y			
Address	3/100 Pacific Highway, North S	ovdnev 2060. NSW	Project	Name	318	001968					EDD ESdat.	Format EQuIS etc	EQui	S					Ha	nđed c	ver by		Sam	Buckle	у			
			iltered".																Em	ail for	nvoice		jauld	@ramb	oll.com	m; asiapac-accou	ınts@ramboll.com	. '
Contact Nan	ne Sam Buckley		otal" or "F																Em	ail for F	Results		auld	@ramb	oll.cor	m; smaxwell@ran	nboll.com	
Phone №	0481 384 112		S specify "T attract SU	डि																hange c		ntainer: type & siz		ecessary,	П	Required Turn. Default will be	around Time (TAT) 5 days if not ticked.)
Special Directi	ons Page 1 of 7		Analyse	Metals(As, Cr, Cu, Pb, Ni, Zn, Cd)																						Overnight (rep	◆Surcharge will apply porting by 9am)◆	
Purchase Ord	der		tals are re	(As, Cr,					-										stk	stic	Stic	vial	Bottle	HDPE)		Same day • 2 days •	☐ 1 day ♣	
Quote ID N			Where me Suj	Metals															500mL Plastic	250mL Plastic	125mL Plastic	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	tos B	5 days (Stand Other(lard)	}
N2		Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)																		UC		35	ēĽ			Comments ods Hazard Warnin	ıg
1	HA1_0.0	17/08/24	8	X																				1		Pb Conc Appr	rox < 5000mg/kg	
2	HA1_0.5	17/08/24	s	X																				1		Pb Conc Appr	ox < 5000mg/kg	
3	HA2_0.0	17/08/24	S	X										file								F		1		Pb Conc Appr	ox < 5000mg/kg	
4	HA2_0.5	17/08/24	s	X																				1		Pb Conc appro	ox > 5000mg/kg	
5	HA3_0,0	17/08/24	S	X			TH																	1	T	Pb Conc Appn	ox < 5000mg/kg	
6	HA3_0.5	17/08/24	s	X				1						T F										1		Pb Conc Appr	ox < 5000mg/kg	
7	HA4_0.0	17/08/24	S	×																				1	ı	Pb Conc Appr	ox < 5000mg/kg	
8	HA4_0.5	17/08/24	s	×													= 11		П	T				1		Pb Conc Appro	ox < 5000mg/kg	
9	HA5_0,0	18/09/24	s	×																	t			1			ox < 5000mg/kg	
10	HA5_0.5	18/09/24	s	×						2														1		Pb Conc Appro	ox < 5000mg/kg	
		Total Cou	unts	10			- 11																	10				
Method of Shipm	nent Courier (#) 🔁 Ha	nd Delivered		☐ Pos	stal	Nan	пе		Sam B	uckley		Signat	ture						Date			9/19/2			Time		
Laboratory Us	Received By Received By	anz Al	(SYD B	BNE MEL	PER A	NDL NTL	DRW	Signa	ature	-	9	4		Dat	o	191	9		Time		3.	7	3		Temperature	3.19	
urofine Environme	Received By	nayoli		SYD B	INE MEL	PER A	_		Signa						Dat	te				Time			1	2.5	7	Report Na	chi F	
* A-WIS PITALI SHILLS	nt reaming resources ray EUO						Submission of	of samples to	to the Johns	atov will be	deamed or	anandanaa .	S Erron I	F-4	d Tanting Cl	landond To		Mar a					100					4

CHAIRCINIENT LEADING WIREINS LIC

ubmission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on reques

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<u> </u>	CHAIN OF CUSTODY RECORD	
*** ===	Eurofins Environment Testing ABN 50 005 085 521	

Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSempleWA@eurofins.com

Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Ramboll		Project	Nº	318	001968					Project Mar	nager	Steph	en Max	well					Sampi	er(s)		Sar	m Buc	kley				
Address	3/100 Pacific Highway, North	h Sydney 2060. NSW	Project N	lame	318	001968					EDD Forn ESdat. EQuil	nat S etc	EQuis	5					На	nded o	ver b	у	Sar	m Buc	kley				
	<u> </u>		Atered"																Em	ail for	Invoi	ce	jaul	ild@ra:	mboli	l,com; a	siapac-accou	nts@rambo!	II.com
Contact Name	Sam Buckley		Fotal" or "F																Em	ail for	Resul	ts	jaul	id@rai	mboli	.com; sı	maxwell@ran	iboll.com	1
Phone №	0481 384 112		es specify " attract SU	n, Cd)				H												Change (ontaine er type &		necessa	ary.	R	equired Turns Default will be	around Time 5 days if not tick	e (TAT) ked.
Special Directions	Page 2 of 7		Analys requested, please amust be used to	Metals(As, Cr, Cu, Pb, Ni, Zn, Cd)																		60					Overnight (rep		m)+
Purchase Order			metals are	ils(As, Ci															Plastic	lastic	Jastic	ber Glas	A TILL	THOSE OF THE PERSON	Bar	E3		☐ 3 days	
Quote ID №			Where	Meta															500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	FAITH DEAC BOHIS	Soumt, PFAS Bottle Jar (Glass or HDPE)	Ashetos Barr	7	Other(aloj)
N⊵		Date/Time	Matrix Solid (S) Water (W)																	į		2	2	oo leg		/ Da	Sample Ingerous Goo	Comments ods Hazard V	Varning
1	HA6_0.0	18/09/24	s	×										I										1		Р	b Cone Appr	ox < 5000 mg	ı/kg
2	HA6_0.5	18/09/24	s	×																			Ī	1		P	b Conc Appr	ox < 5000mg	j/kg
3	HA7_0.0	18/09/24	S	X																				-1		Р	b Conc Appr	ox < 5000mg	ı/kg
4.	HA7_0,5	18/09/24	s	X																				1		P	b Conc Appr	ox < 5000mg	ı/kg
5	HA8_0.0	18/09/24	S	X																				1		P	b Conc Appr	ox < 5000mg	J∕kg
6.	HA8_0.5	18/09/24	s	X																				1		P	b Conc Appr	ox < 5000mg	/kg
7	HA9_0.0	18/09/24	s	×																				1		P	b Conc Appr	ox < 5000mg	/kg
8	HA9_0,5	18/09/24	s	X																			Ī	1		P	b Conc Appr	ox < 5000mg	/kg
9	HA10_0.0	18/09/24	s	X																T				1		P	b Conc Appro	ox < 5000mg	/kg
10	HA10_0.5	18/09/24	s	X																				1	Ī	P	b Conc Appro	ox < 5000mg	/kg
		Total Cour	nts	10																				10					
Method of Shipment	Courier (#) 📝 Han	d Delivered		☐ Po	stal	Na	me		Sam B	uckley		Signat	ure						Date			9/1	19/202	4		Time		
Laboratory Use Onl	Received By			SYD B	BNE MEL	- PER	adl NTL	DRW	Signati	ure		- 11-2			Da	te				Time	1					Те	emperature		
iura@ne Saudenama = T	Received By			SYD B	SNE MEL	-	ADL NTL		Signati						Da			16.		Time						1	Report No		
urofins Environment Test	ung Australia Pty Ltd					1	Submission	of samples	to the laborate	ory will be	deemed as acce	eptance o	f Eurofins !	Environme	ent Testino 5	Standard Te	erms and Co	onditions un	ess agn	ed othe	WISH A	conv is	avallat	ble on re	cuest				

CHAIN OF CU
Eurofins Environment

Sydney Laboratory
Unit F3 Btd.F 16 Mars Road Lane Cove West NSW 2066 USTODY RECORD and Testing ABN 50 005 085 521 02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com Perth Laboratory
Unit 2 91 Leach Highway Kewdate WA 6105
08 9251 9600 EnviroSampteWA@eurofins.com

Melbourne Laboratory 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

										Project Manage	St	phen Max	well				S	ampler	(s)	Sa	m Buc	kley		
3/100 Dacific Winhway North Sw	dnay 2060 NSW	Project	Name	318	001968					EDD Format ESdat, EQuIS etc	EC	utS					Han	ded ov	er by	Sa	m Buc	kley		
wroer acine ingitway, feoral Sy	aney 2000, 14394	llered".						e.									Emai	il for In	voice	ja	ıld@ra	mbol	l.com; asiapac-accou	nts@ramboll.com
Sam Buckley		otal" or TE TE pricing															Ema	il for Re	sults	ja	ıld@ra	mbol	l.com; smaxwell@ran	boll.com
0481 384 112		ssecify "T	, cd															ange cor	Cont tainer typ	ainers e & size	fnecess	агу.	Required Turna Default will be	around Time (TAT) 5 days if not ticked.
Page 3 of 7		Analyse equested, please must be used to	, Cu, Pb, Ni, Zı																				Overnight (rep	
		netals are i UITE code	s(As, Cr														lastic	Tastic Tastic	oer Glas	A via	S Bottle		party.	☐ 3 days ●
		Where r	Meta														500mL F	250mL F	mL Am	40mL VC	OML PFA	oldss	Other(aro))
	Sampled Date/Time dd mm yy hhimm	Matrix Solid (S) Water (W)																	200					Comments ds Hazard Warning
HA11_0.0	18/09/24	S	X																		-1		Pb Conc Appr	ox < 5000mg/kg
HA12_0.0	18/09/24	s	×																		1		Pb Conc Appro	ox < 5000mg/kg
HA12_0.5	18/09/24	s	×																		1		Pb Conc Appro	ox < 5000mg/kg
HA13_0.0	18/09/24	s	×																		1	Ī	Pb Conc Appro	ox < 5000mg/kg
HA14_0.0	18/09/24	S	×																		1	3	Pb Conc Appro	ox < 5000mg/kg
TP1_0.0	17/09/24	s	×													- 1					1		Pb Conc appro	x > 5000mg/kg
TP1_0.5	17/09/24	S	×															T			1		Pb Conc appro	x > 5000mg/kg
TP1_1,0	17/09/24	s	×																		1		Pb Conc Appro	ox < 5000mg/kg
TP1_1,5	17/09/24	s	×															T			1		Pb Conc Appro	ox < 5000mg/kg
TP1_2.0	17/09/24	s	×																		1	Ī	Pb Cone Appro	ox < 5000mg/kg
	Total Co	ounts	10																		10			
Courier (#) 🖸 H	land Delivered		☐ Po	stai	Nan	ne		Sam Bu	uckley	Sig	nature						Date		9	19/202	4	Time	
Received By			SYD E	BNE MEL	. PER A	ADL NTL	DRW	Signat	ture				Dat	te				Time					Temperature	
Received By			SYD E	BNE MEL	PER A	ADL NTL	DRW	Signat	ture			, i H	Dai	le				Time	Ė				Report №	
	HA11_0.0 HA12_0.0 HA12_0.0 HA13_0.0 HA14_0.0 TP1_0.5 TP1_1.0 TP1_1.5 TP1_2.0 Courier (# Received By	### A81 384 112 Page 3 of 7		100 Pacific Highway, North Sydney 2060, NSW 100 Pacific Highway,	100 Pacific Highway, North Sydney 2060, NSW 100 Pacific Highway,	### Sam Buckley ### Sam Buckley ### Sam Buckley ### Bu	Sampled Date Time Add To 'O' S Sign Sampled Date Time Date Date	Sam Buckley	Sampled Date Time dd may p Penns Matrix Sara Sampled Date Time dd may p Penns Matrix Sara Sampled Date Time dd may p Penns Matrix Sara Sampled Date Time dd may p Penns Matrix Sara Sampled Date Time dd may p Penns Matrix Sara Sampled Date Matrix Sara Sampled Sampl	Sampled Samp				Maria Sampled Sampled Date Time Sampled Samp	Main Backley	Maria Buckley Maria Sydney 2000, MSW Maria Buckley Mar	1/10 1/10	1/10 1/10	1000 Pacific Highway, North Sydnoy 2009, NSW 1000 Pacific Highway, N	Marie Mari	Control of Property Security Security	Marie Mari	Part Part	March Marc

	CHAIN OF CUSTODY RECORD
*** ===	Eurofins Environment Testing ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1 21 Smallwood Place Murarie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Cor	npany	Ramboll	Proj	ect Nº	318	1001968			1		Project	Manager	Stepl	hen Max	well				ample	r(s)		Sam	Buckle	ву			
٨٨	dress	3/100 Pacific Highway, No	rth Swiney 2060 NSW	Projec	t Name	318	001968			31		EDD I ESdat. 8	Format EQuIS etc	EQui	s				Hai	ided o	ver by		Sam	Buckk	ву		
7.4	urcss	or too t domo riighway, no	an oyuncy 2000, Nor	llered"															Em	il for I	nvoic	2	jauld	@ram	boll.c	om; asiapac-accounts	@ramboll.com
Conta	ct Name	Sam Buckley		otal" or "F															Em	ill for R	esult		jauld	@ram!	oli.c	om; smaxwell@rambol	II.com
Pho	one №	0481 384 112		ss specify "T attract SUI	, cd														C	hange co	Co	ntainer type & si	's ize if ni	ecessary		Required Turnarou Default will be 5 day	und Time (TAT) sys if not licked.
Special	Directions	Page 4 of 7		Analyse equested, please must be used to	Metals(As, Cr, Cu, Pb, Ni, Zn, Cd)													H								+si Overnight (reporti	
Purcha	se Order			etals are re	s(As, Cr,														astic	lastic	asno	A vial	S Bottle	r HDPE)	Bag	2 days	☐ 3 days ●
Quo	te ID Nº			Where m	Metals														500mL Plastic	250mL Piastic	LEDML PIASUC	40mL VOA viai	Sooml. PFAS Bottle	Jar (Glass or HDPE)	Asbetos Bag	5 days (Standard) Other()
Ne			Sampled Date/Time dd mmlyy hhimm	Matrix Solid (S) Water (W)																	906	7	200	Jar		Sample Cor / Dangerous Goods	
1	1	TP1_2.5	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
2		TP1_3.0	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
3		TP2_0.0	17/08/24	S	×																			1		Pb Conc Approx	< 5000mg/kg
4		TP2_0.5	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
5		TP2_1.0	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
6		TP2_1.5	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
7		TP2_2.0	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
8		TP3_0,0	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
9		TP3_0.5	17/08/24	S	×												1							1		Pb Conc approx >	- 5000mg/kg
10		TP3_1.0	17/08/24	s	×																			1		Pb Conc approx >	5000mg/kg
			Total C	Counts	10					3	T													10			
Method o	f Shipment	Courier (#) 🖸	Hand Delivered		Po	ostal	Na	ame		Sam E	Buckley		Signa	ture					Date			9/19	3/2024		Time	
Labora	itory Use Only				SYD	BNE ME	L PER	ADL NTL	L DRW	Signa	ature					D	ate			Time				11		Temperature	
Eurofine C	ndronment Tasti	Received By		- n F	SYD	BNE ME	L PER	ADL NTL		Signa			aroantonoa				átě			Time						Report №	

CHAIN OF CUSTODY RECORD
Eurofins Environment Testing ABN 50 005 085 521

Unit F3 Bid.F 16 Mars Road Lane Cove West NSW 2066 '02 9900 8400 EnviroSampleNSW@eurofins.com

Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory

8 Monterey Road Dandenong South VIC 3175

03 8564 5000 EnviroSampleVic@eurofins.com

Company	Ramboli		Projec	ct Nº	318	001968					Project Ma	anager	Steph	en Maxv	vell			S	ample	(s)	s	am E	Buckle	ry		
Address	3/100 Pacific Highway, No	rth Sydney 2860 NSW	Project	Name	318	001968					EDD Fo ESdat. EQ	rmat ulS etc	EQuis	S				Han	ded ov	er by	s	am E	Buckle	y		
Addicas	orios i dollo riginaly, no	rai Oyulley 2000, NOTF	llered".														- 1	Ema	il for Ir	voice	ja	auld(@ramt	oll.cc	om; asiapao-accounts	@rambolLcom
Contact Name	Sam Buckley		otal" or "Fi TE pricing															Ema	il for Re	sults	ja	uld@	@ramb	oll.cc	om; smaxwell@rambol	il.com
Phone №	0481 384 112		specify Transct SUI	(g)		Ш												ÇI		Cor tainer t	tainers ype & size	e if nec	cessary.		Required Turnarou Default will be 5 da	und Time (TAT) ays if not ticked.
Special Directions	Page 5 of 7		Analyse requested, please amust be used to	Metals(As, Cr, Cu, Pb, Ni, Zn, Cd)																49		da			Overnight (reporti	
Purchase Order			metals are	ls(As, Cr					1									lastic	Hastic	ber Glas)A vial	AS Bottle	or HDPE			☐ 3 days ●
Quote ID №			Where	Meta				H										500mL Plastic	250mL Plastic	200ml. Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Asbetos Bag	Other()
Ni		Sampled Date/Time dd/mm/yy.hh.mm	Matrix Solid (S) Water (W)																	20		50	EL.		Sample Co / Dangerous Goods	
it	TP3_1.5	17/08/24	s	X																			1		Pb Conc Approx	< 5000mg/kg
2	TP3_2.0	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
3	TP3_2.5	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
4	TP4_0.0	17/08/24	s	×										H									1		Pb Conc approx >	> 5000mg/kg
5	TP4_0.5	17/08/24	S	×																			1		Pb Conc Approx	< 5000mg/kg
6	TP4_1.0	17/08/24	s	×																	П		1		Pb Conc Approx	< 5000mg/kg
7	TP4_1.5	17/08/24	S	×																		ī	1		Pb Conc Approx	< 5000mg/kg
8	TP4_2.0	17/08/24	s	×										M			51				П	F	1		Pb Conc Approx	< 5000mg/kg
9	TP5_0.0	17/08/24	s	×																			1		Pb Conc Approx	< 5000mg/kg
10	TP5_0.5	17/08/24	S	×																		H	1		Pb Conc Approx	< 5000mg/kg
		Total Cou	ints	10																			10			
Method of Shipment	Courier (#) 🖸 Har	nd Delivered		II Po	staf	Na	ame		Sam B	uckley		Signat	ture					Date			9/19/	2024		Time	
Laboratory Use O	Received By			SYD E	BNE MEI	PER	ADL NTI	DRW	Signati	ure					Dat	е			Time						Temperature	
Eurofins Environment Te	Received By		115	SYD E	SNE MEI	PER			Signate s to the laborate						Date				Time						Report No	

48.	
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CHAIN OF CUSTODY RECORD Eurofins | Environment Testing ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Methourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8584 5000 EnviroSampleVic@eurofins.com

Company	Ramboll	Proje	ct №	318	001968					Project Mana	ager	Stephe	n Maxv	vell					Sampl	er(s)		San	Buck	ley				
Address	3/100 Pacific Highway, North	Sudney 2860 NSW	Project	Name	3186	001968					EDD Form ESdat, EQuIS	at etc	EQuis						Hai	nded c	ver b		San	n Buck	ley			
Address	ortour domornighmay, north	oyuncy 2000, NOT	llered".																Em	ail for	nvoic	е	jaul	d@ran	nboll.	com; asiapac-accoun	ts@ramboll.com	,
Contact Name	Sam Buckley		otal" or "F																Ema	ail for f	Result	s	Jaul	d@ran	ıboll.	com; smaxwell@ramt	ooll.com	
Phone №	0481 384 112		ss specify "T attract SU	, cd)										H					С	hange c	Co ontaine	ntaine type & s	rs size if (recessa	ry.	Required Turna Default will be 5	round Time (TAT) days if not licked.	
Special Directions	Page 6 of 7		Analyse requested, please must be used to	Metals(As, Cr, Cu, Pb, Ni, Zn, Cd)																		60				Overnight (repo		
Purchase Order			netals are UITE code	s(As, Cr															lastic	lastic	lastic	A vial	Bottle	r HDPE	Bag	П	☐ 3 days •	I
Quote ID №			Where r	Meta															500mL Plastic	250mL Plastic	125mL Plastic	40mL VOA vial	500ml PFAS Bottle	Jar (Glass or HDPE)	Asbetos Bag	Other(1)
Ne		Sampled Date/Time dd mm yy hh:mm	Matrix Solid (S) Water (W)																			07		e,			Comments ds Hazard Warning	
1	TP5_1.0	17/08/24	S	×						7														1		Pb Conc Appro	x < 5000mg/kg	
2	TP5_1.5	17/08/24	S	×																				1		Pb Conc Appro	x < 5000mg/kg	
3	TP5_2.0	17/08/24	s	×																				1		Pb Conc Appro	x < 5000mg/kg	
4	TP5_2.5	17/08/24	s	×																				1		Pb Conc Appro	x < 5000mg/kg	
5	TP6_0.0	17/08/24	S	×																		Ī		1		Pb Conc Appro	x < 5000mg/kg	i
6	TP6_0.5	17/08/24	s	×										1										1		Pb Conc Appro	x < 5000mg/kg	i
7	TP6_1.0	17/08/24	5	×			M					1								Ì			Ī	1		Pb Conc Appro	x < 5000mg/kg	
8	TP6_1,5	17/08/24	s	×																				1		Pb Conc Approx	x < 5000mg/kg	i
9	TP6_2.0	17/08/24	s	×																				11:		Pb Conc Approx	x < 5000mg/kg	
10	TP6_2.5	17/08/24	s	X																	ı			1		Pb Conc Approx	x < 5000mg/kg	
		Total Co	ounts	10																				10				
Method of Shipment	Courier (#) @ H	land Delivered		Po	stal	Na	me		Sam B	uckley		Signatur	re						Date			9/1	9/2024		Time		- Break
Laboratory Use On	Received By			SYD E	BNE MEL	PER /	ADL NTL	DRW	Signati	ure					Dal	8				Time						Temperature		
Eurofins Environment Tes	Received By			SYD E	BNE MEL	_ PER /			Signati		danmed se secon		155		Dat		arms and Co	-		Time						Report №		



CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 Enviro Sample QLD @eurofins.com Perth Laboratory Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com Melbourne Laboratory 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Ramboli		Proje	ct Nº	3180	001968					Project M	anager	Stephe	n Maxw	vell				:	Sample	er(s)		Sar	m Buc	kley			
Address	3/100 Pacific Highway, North Sy	rdnou 2050 NSIN	Project	Name	3180	001968					EDD Fo	rmat ulS etc	EQuiS						Hai	nded o	ver b	у	Sai	m Buc	kley			
Varitees	3/100 Facilie riighway, Notul Sy	(diley 2000, NS#	'Fillered' ng.																Ema	ail for I	nvoid	e	jau	ld@ra	mbo	II.cor	n; asiapac-accounts@ramboll.co	m
Contact Name	Sam Buckley		otal" or "F TE pricing	4						- 1									Em	all for F	Resul	is	jau	ld@rai	mbol	il.con	n; smaxwell@ramboll.com	
Phone №	0481 384 112		S specify "T attract SUJ	(cd)															C	hange c		ontaine r type &		necessa	ary.	1	Required Turnaround Time (TA Default will be 5 days if not ticked.	AT)
Special Directions	Page 7 of 7		Analyse e requested, please de must be used to	Metals(As, Cr, Cu, Pb, Ni, Zn, Cd)												Ē						355		E E	7		*Surcharge will app Overnight (reporting by 9am) Same day 1 day	yk
Purchase Order			metals ar SUITE co	als(As, C															500mL Plastic	250mL Plastic	125mL Plastic	OmL Amber Ga		AS BOT			2 days •	
Quote ID №			Where	Met															500mL	250mL	125mL	200mL Amber Glass		Soumt, PFAS Bottle		Aspet	Other()
Ne		Date/Time	Matrix Solid (S) Water (W)							C												8		Б			Sample Comments / Dangerous Goods Hazard Warr	ning
1	TP6_3,0	17/08/24	S	×																				1			Pb Conc Approx < 5000mg/kg	
2	D01_20240917	17/08/24	S	×																				1			Pb Conc Approx < 5000mg/kg	
3	D02_20240917	17/08/24	s	×																				1			Pb Conc Approx < 5000mg/kg	
4	D03_20240917	18/08/24	8	×																				1			Pb Conc Approx < 5000mg/kg	
5	T01_20240917	17/08/24	s	×																				1			Please forward to ALS Pb Con Approx < 5000mg/kg	IC
6	T02_20240917	17/08/24	s	×																				1			Please forward to ALS Pb Con Approx < 5000mg/kg	IC
7	T03_20240917	18/08/24	S	×																				1			Please forward to ALS Pb Con Approx < 5000mg/kg	ec .
827	R01_20240917	17/08/24	s	×				H																1			Pb Conc Approx < 5000mg/kg	
9	R02_20240918	18/09/24	s	×																				1			Pb Conc Approx < 5000mg/kg	
10																												
		Total Cou	nts	9											П		П		П		ı		Ī	9		1		Ħ
Method of Shipment	Courier (#) 🖭 Han	d Delivered		□ Pc	stal	Nan	ne		Sam Bu	ıckley		Signatu	ire						Date			9/	19/202	4		Time	
Laboratory Use On	Received By			SYD I	BNE ME	L PER	adl ntl) DRW	Signatu	ıre					Da	ite				Тілж	3						Temperature	
ivenflug Environment Toe	Received By			SYD I	BNE ME		ADL NTL		Signatu						Da			de		Time						j	Report Nz	



ABN: 47 009 120 549

EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Geelong Melbourne 6 Monterey Road 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street Dandenong South Grovedale VIC 3175 VIC 3216 +61 3 8564 5000 +61 3 8564 5000 NATA# 1261 NATA# 1261 Site# 1254 Site# 25403

Girraween NSW 2145 +61 2 9900 8400 NATA# 1261 Site# 18217

Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466

Murarrie QLD 4172 T: +61 7 3902 4600 +61 2 4968 8448 NATA# 1261 Site# 20794 & 2780 Site# 25079

Newcastle 1/21 Smallwood Place 1/2 Frost Drive Mayfield West NSW 2304 NATA# 1261

Perth 46-48 Ranksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2377 Site# 2370

ABN: 91 05 0159 898

Perth ProMicro 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

Penrose, Auckland 1061 +64 9 526 4551

NZBN: 9429046024954

35 O'Rorke Road Unit C1/4 Pacific Rise 43 Detroit Drive Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1327 IANZ# 1308

Tauranga 1277 Cameron Road Rolleston, Gate Pa, Christchurch 7675 Tauranga 3112 +64 3 343 5201 +64 9 525 0568 IANZ# 1290 IANZ# 1402

Sample Receipt Advice

Company name: Contact name: Project name: Project ID:

Ramboll Australia Pty Ltd Stephen Maxwell 318001968 318001968

7 Day Sep 19, 2024 3:23 PM Turnaround time: Date/Time received **Eurofins reference**

Sample Information

A detailed list of analytes logged into our LIMS, is included in the attached summary table.

All samples have been received as described on the above COC.

COC has been completed correctly.

Attempt to chill was evident.

Appropriately preserved sample containers have been used.

All samples were received in good condition.

Samples have been provided with adequate time to commence analysis in accordance with the relevant

Appropriate sample containers have been used.

Sample containers for volatile analysis received with zero headspace.

Split sample sent to requested external lab.

Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

T01 T02 T03 TOP ALS

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone: (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Stephen Maxwell - smaxwell@ramboll.com.

Note: A copy of these results will also be delivered to the general Ramboll Australia Pty Ltd email address.





ABN: 50 005 085 521

Melbourne Geelong 6 Monterey Road Dandenong South Grovedale VIC 3175 VIC 3216 +61 3 8564 5000 NATA# 1261 Site# 25403 Site# 1254

Sydney Canberra 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Girraween Mitchell NSW 2145 ACT 2911 +61 2 9900 8400 +61 3 8564 5000 +61 2 6113 8091 NATA# 1261 NATA# 1261 NATA# 1261

Site# 18217

Site# 25466

Brisbane Newcastle Murarrie Mayfield West QLD 4172 NSW 2304 T: +61 7 3902 4600 +61 2 4968 8448 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

ABN: 91 05 0159 898 Perth

46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2377 Site# 2370

ABN: 47 009 120 549

Perth ProMicro

+61 8 6253 4444

Welshpool

WA 6106

NATA# 2561

Site# 2554

46-48 Banksia Road

Auckland 35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327

NZBN: 9429046024954

Auckland (Focus) Unit C1/4 Pacific Rise. Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308

Christchurch Tauranga 43 Detroit Drive Rolleston, Christchurch 7675 Tauranga 3112 +64 3 343 5201 IANZ# 1290

1277 Cameron Road. Gate Pa, +64 9 525 0568 IANZ# 1402

Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968 Order No.:

Report #: 1141337 Phone:

02 9954 8118 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

			ımple Detail			Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set	
	ney Laboratory		Х	Х	Х	Х	Х	Х	X	Х				
	rnal Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID									
1	HA1_0.0	Aug 17, 2024		Soil	S24-Se0052813	Х	Х	Х	Х	Х	Х	Х	Х	
2	HA1_0.5	Aug 17, 2024		Soil	S24-Se0052814	Х	Х	Х	Х	Х	Х	Х	Х	
3	HA2_0.0	Aug 17, 2024		Soil	S24-Se0052815	Х	Х	Х	Х	Х	Х	Х	Х	
4	HA2_0.5	Aug 17, 2024		Soil	S24-Se0052816	Х	Х	Х	Х	Х	Х	Х	Х	
5	HA3_0.0	Aug 17, 2024		Soil	S24-Se0052817	Х	Х	Х	Х	Х	Х	Х	Х	
6	HA3_0.5	Aug 17, 2024		Soil	S24-Se0052818	Х	Х	Х	Х	Х	Х	Х	Х	
7	HA4_0.0	Aug 17, 2024		Soil	S24-Se0052819	Х	Х	Х	Х	Х	Х	Х	Х	
8	HA4_0.5	Aug 17, 2024		Soil	S24-Se0052820	Х	Х	Х	Х	Х	Х	Х	Х	
9	HA5_0.0	Sep 18, 2024		Soil	S24-Se0052821	Х	Х	Х	Х	Х	Х	Х	Х	
10	HA5_0.5	Sep 18, 2024		Soil	S24-Se0052822	Х	Х	Х	Х	Х	Х	Х	Х	
11	HA6_0.0	Sep 18, 2024		Soil	S24-Se0052823	Х	Х	Х	Х	Х	Х	Х	Х	
12	HA6_0.5	Sep 18, 2024		Soil	S24-Se0052824	Х	Х	Х	Х	Х	Х	Х	Х	
13	HA7_0.0	Sep 18, 2024		Soil	S24-Se0052825	Х	Х	Х	Х	Х	Х	Х	Х	
14	HA7_0.5	Sep 18, 2024		Soil	S24-Se0052826	Х	Х	Х	Х	Х	Х	Х	Х	l



ABN: 50 005 085 521

Melbourne Geelong 6 Monterey Road Dandenong South Grovedale VIC 3175 VIC 3216 +61 3 8564 5000 +61 3 8564 5000 NATA# 1261 NATA# 1261 Site# 25403

Sydney Canberra 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Girraween Mitchell NSW 2145 ACT 2911 +61 2 9900 8400 +61 2 6113 8091 NATA# 1261 NATA# 1261 Site# 25466 Site# 18217

Brisbane Newcastle Murarrie Mayfield West QLD 4172 NSW 2304 T: +61 7 3902 4600 +61 2 4968 8448 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

Perth 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2377 Site# 2370

NZBN: 9429046024954

ABN: 47 009 120 549

Welshpool

WA 6106

Site# 2554

Perth ProMicro Auckland 46-48 Banksia Road 35 O'Rorke Road Penrose, Auckland 1061 +61 8 6253 4444 +64 9 526 4551 NATA# 2561 IANZ# 1327

Auckland (Focus) Unit C1/4 Pacific Rise. 43 Detroit Drive Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308

Christchurch Tauranga 1277 Cameron Road. Rolleston, Gate Pa, Christchurch 7675 Tauranga 3112 +64 3 343 5201 +64 9 525 0568 IANZ# 1290 IANZ# 1402

Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

1141337 Phone:

ABN: 91 05 0159 898

02 9954 8118 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

''	oject ib.	310001900												
		Sa	imple Detail			Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set	
Syd	ney Laboratory	- NATA # 1261	Site # 18217			Х	Х	Х	Х	Х	Х	Х	Х	
15	HA8_0.0	Sep 18, 2024		Soil	S24-Se0052827	Х	Х	Х	Х	Х	Х	Х	Х	ı
16	HA8_0.5	Sep 18, 2024		Soil	S24-Se0052828	Х	Х	Х	Х	Х	Х	Х	Х	ı
17	HA9_0.0	Sep 18, 2024		Soil	S24-Se0052829	Х	Х	Х	Х	Х	Х	Х	Х	ı
18	HA9_0.5	Sep 18, 2024		Soil	S24-Se0052830	Х	Х	Х	Х	Х	Х	Х	Х	l
19	HA10_0.0	Sep 18, 2024		Soil	S24-Se0052831	Х	Х	Х	Х	Х	Х	Х	Х	l
20	HA10_0.5	Sep 18, 2024		Soil	S24-Se0052832	Х	Х	Х	Х	Х	Х	Х	Х	l
21	HA11_0.0	Sep 18, 2024		Soil	S24-Se0052833	Х	Х	Х	Х	Х	Х	Х	Х	l
22	HA12_0.0	Sep 18, 2024		Soil	S24-Se0052834	Х	Х	Х	Х	Х	Х	Х	Х	l
23	HA12_0.5	Sep 18, 2024		Soil	S24-Se0052835	Х	Х	Х	Х	Х	Х	Х	Х	ı
24	HA13_0.0	Sep 18, 2024		Soil	S24-Se0052836	Х	Х	Х	Х	Х	Х	Х	Х	ı
25	HA14_0.0	Sep 18, 2024		Soil	S24-Se0052837	Х	Х	Х	Х	Х	Х	Х	Х	ı
26	TP1_0.0	Sep 17, 2024		Soil	S24-Se0052838	Х	Х	Х	Х	Х	Х	Х	Х	l
27	TP1_0.5	Sep 17, 2024		Soil	S24-Se0052839	Х	Х	Х	Х	Х	Х	Х	Х	ı
28	TP1_1.0	Sep 17, 2024		Soil	S24-Se0052840	Х	Х	Х	Х	Х	Х	Х	Х	1
29	TP1_1.5	Sep 17, 2024		Soil	S24-Se0052841	Х	Х	Х	Х	Х	Х	Х	Х	1
30	TP1_2.0	Sep 17, 2024		Soil	S24-Se0052842	Х	Х	Х	Х	Х	Х	Х	Х	1
31	TP1_2.5	Aug 17, 2024		Soil	S24-Se0052843	Х	Х	Х	Х	Х	Х	Х	Х	1



Site# 25403

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South Grovedale VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254

Geelong Sydney Canberra Girraween Mitchell VIC 3216 NSW 2145 ACT 2911 +61 3 8564 5000 +61 2 9900 8400 NATA# 1261 NATA# 1261 NATA# 1261

Site# 18217

Brisbane 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Murarrie QLD 4172 T: +61 7 3902 4600 +61 2 6113 8091 NATA# 1261 Site# 25466 Site# 20794 & 2780

Newcastle Mayfield West NSW 2304 +61 2 4968 8448 NATA# 1261 Site# 25079

ABN: 91 05 0159 898

NZBN: 9429046024954 ABN: 47 009 120 549

> Perth ProMicro 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

Auckland Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327

Auckland (Focus) 35 O'Rorke Road Unit C1/4 Pacific Rise. 43 Detroit Drive Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308

Christchurch Tauranga Rolleston, Gate Pa, Christchurch 7675 Tauranga 3112 +64 3 343 5201 IANZ# 1290

1277 Cameron Road. +64 9 525 0568 IANZ# 1402

Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Site# 2370 Order No.:

Perth

Welshpool

NATA# 2377

WA 6106

46-48 Banksia Road

+61 8 6253 4444

Report #: Phone: Fax:

1141337 02 9954 8118 02 9954 8150

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

		Sa	ımple Detail			Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set	
Syd	ney Laboratory	- NATA # 1261	Site # 18217	7		Х	Х	Х	Х	Х	Х	Х	Х	
32	TP1_3.0	Aug 17, 2024		Soil	S24-Se0052844	Х	Х	Х	Х	Х	Х	Х	Х	
33	TP2_0.0	Aug 17, 2024		Soil	S24-Se0052845	Х	Х	Х	Х	Х	Х	Х	Х	
34	TP2_0.5	Aug 17, 2024		Soil	S24-Se0052846	Х	Х	Х	Х	Х	Х	Х	Х	
35	TP2_1.0	Aug 17, 2024		Soil	S24-Se0052847	Х	Х	Х	Х	Х	Х	Х	Х	
36	TP2_1.5	Aug 17, 2024		Soil	S24-Se0052848	Х	Х	Х	Х	Х	Х	Х	Х	
37	TP2_2.0	Aug 17, 2024		Soil	S24-Se0052849	Х	Х	Х	Х	Х	Х	Х	Х	
38	TP3_0.0	Aug 17, 2024		Soil	S24-Se0052850	Х	Х	Х	Х	Х	Х	Х	Х	
39	TP3_0.5	Aug 17, 2024		Soil	S24-Se0052851	Х	Х	Х	Х	Х	Х	Х	Х	
40	TP3_1.0	Aug 17, 2024		Soil	S24-Se0052852	Х	Х	Х	Х	Х	Х	Х	Х	
41	TP3_1.5	Aug 17, 2024		Soil	S24-Se0052853	Х	Х	Х	Х	Х	Х	Х	Х	
42	TP3_2.0	Aug 17, 2024		Soil	S24-Se0052854	Х	Х	Х	Х	Х	Х	Х	Х	
43	TP3_2.5	Aug 17, 2024		Soil	S24-Se0052855	Х	Х	Х	Х	Х	Х	Х	Х	
44	TP4_0.0	Aug 17, 2024		Soil	S24-Se0052856	Х	Х	Х	Х	Х	Х	Х	Х	
45	TP4_0.5	Aug 17, 2024		Soil	S24-Se0052857	Х	Х	Х	Х	Х	Х	Х	Х	
46	TP4_1.0	Aug 17, 2024		Soil	S24-Se0052858	Х	Х	Х	Х	Х	Х	Х	Х	
47	TP4_1.5	Aug 17, 2024		Soil	S24-Se0052859	Х	Х	Х	Х	Х	Х	Х	Х	
48	TP4_2.0	Aug 17, 2024		Soil	S24-Se0052860	Х	Х	Х	Х	Х	Х	Х	Χ	



Site# 25403

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South Grovedale VIC 3175 +61 3 8564 5000 NATA# 1261

Geelong Sydney Canberra 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Girraween Mitchell VIC 3216 NSW 2145 ACT 2911 +61 2 9900 8400 +61 3 8564 5000 +61 2 6113 8091 NATA# 1261 NATA# 1261 NATA# 1261

Site# 18217

Site# 25466

Brisbane Newcastle Murarrie QLD 4172 NSW 2304 T: +61 7 3902 4600 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

Mayfield West +61 2 4968 8448 ABN: 47 009 120 549

Perth ProMicro 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

Auckland 35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327

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Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Site# 2370 Order No.: Report #:

Fax:

Perth

Welshpool

NATA# 2377

WA 6106

Phone:

ABN: 91 05 0159 898

46-48 Banksia Road

+61 8 6253 4444

1141337 02 9954 8118 02 9954 8150 Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

		Sa	ample Detail			Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set	
Syd	ney Laboratory	- NATA # 1261	Site # 1821	7		Х	Х	Х	Х	Х	Х	Х	Х	
49	TP5_0.0	Aug 17, 2024		Soil	S24-Se0052861	Х	Х	Х	Х	Х	Х	Х	Х	
50	TP5_0.5	Aug 17, 2024		Soil	S24-Se0052862	Х	Х	Х	Х	Х	Х	Х	Х	
51	TP5_1.0	Aug 17, 2024		Soil	S24-Se0052863	Х	Х	Х	Х	Х	Х	Х	Х	
52	TP5_1.5	Aug 17, 2024		Soil	S24-Se0052864	Х	Х	Х	Х	Х	Х	Х	Х	
53	TP5_2.0	Aug 17, 2024		Soil	S24-Se0052865	Х	Х	Х	Х	Х	Х	Х	Х	
54	TP5_2.5	Aug 17, 2024		Soil	S24-Se0052866	Х	Х	Х	Х	Х	Х	Х	Х	
55	TP6_0.0	Aug 17, 2024		Soil	S24-Se0052867	Х	Х	Х	Х	Х	Х	Х	Х	
56	TP6_0.5	Aug 17, 2024		Soil	S24-Se0052868	Х	Х	Х	Х	Х	Х	Х	Х	
57	TP6_1.0	Aug 17, 2024		Soil	S24-Se0052869	Х	Х	Х	Х	Х	Х	Х	Х	
58	TP6_1.5	Aug 17, 2024		Soil	S24-Se0052870	Х	Х	Х	Х	Х	Х	Х	Х	
59	TP6_2.0	Aug 17, 2024		Soil	S24-Se0052871	Х	Х	Х	Х	Х	Х	Х	Х	
60	TP6_2.5	Aug 17, 2024		Soil	S24-Se0052872	Х	Х	Х	Х	Х	Х	Х	Х	
61	TP6_3.0	Aug 17, 2024		Soil	S24-Se0052873	Х	Х	Х	Х	Х	Х	Х	Х	
62	D01_2024091 7	Aug 17, 2024		Soil	S24-Se0052874	Х	Х	Х	Х	Х	Х	х	х	
63	D02_2024091	Aug 17, 2024		Soil	S24-Se0052875	X	x	х	х	х	х	х	х	



Site# 25403

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South Grovedale VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254

Geelong Sydney 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Girraween VIC 3216 NSW 2145 +61 2 9900 8400 +61 3 8564 5000 NATA# 1261 NATA# 1261

Site# 18217

Canberra Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466

Brisbane

Murarrie

Newcastle Mayfield West QLD 4172 NSW 2304 +61 2 4968 8448 T: +61 7 3902 4600 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

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> Perth ProMicro 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

Auckland Auckland (Focus) 35 O'Rorke Road Unit C1/4 Pacific Rise. Penrose, Mount Wellington, Auckland 1061 Auckland 1061 +64 9 526 4551 +64 9 525 0568 IANZ# 1327 IANZ# 1308

Christchurch Tauranga 43 Detroit Drive 1277 Cameron Road. Rolleston, Gate Pa, Christchurch 7675 Tauranga 3112 +64 3 343 5201 +64 9 525 0568 IANZ# 1290 IANZ# 1402

Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #: Phone:

Fax:

ABN: 91 05 0159 898

1141337

02 9954 8118 02 9954 8150

Sep 19, 2024 3:23 PM Sep 30, 2024 Received: Due:

Priority: Contact Name: 7 Dav

Stephen Maxwell

	Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217								Copper	Lead	Nickel	Zinc	Moisture Set
Syd	ney Laboratory	- NATA # 1261	Site # 18217	•		Х	Х	Х	Х	Х	Х	Х	Х
64	D03_2024091 7	Aug 18, 2024		Soil	S24-Se0052876	х	Х	Х	х	х	Х	х	Х
65	R01_2024091 7	Aug 17, 2024		Water	S24-Se0052877	Х	Х	Х	Х	Х	Х	х	
66	R02_2024091	Sep 18, 2024		Water	S24-Se0052878	Х	Х	Х	Х	Х	Х	х	
Test	Counts				66	66	66	66	66	66	66	64	



Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: Stephen Maxwell

 Report
 1141337-S

 Project name
 318001968

 Project ID
 318001968

 Received Date
 Sep 19, 2024

Client Sample ID			HA1_0.0	HA1_0.5	HA2_0.0	HA2_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Se0052813	S24-Se0052814	S24-Se0052815	S24-Se0052816
Date Sampled			Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	Aug 17, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	13	13	15	71
Cadmium	0.4	mg/kg	0.5	< 0.4	< 0.4	0.5
Chromium	5	mg/kg	15	16	12	< 5
Copper	5	mg/kg	60	17	60	280
Lead	5	mg/kg	240	100	400	10000
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	1000	110	180	500
Sample Properties						
% Moisture	1	%	4.2	9.9	16	24

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			Soil S24-Se0052817	Soil S24-Se0052818	Soil	HA4_0.5 Soil S24-Se0052820 Aug 17, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	19	8.4	6.9	9.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	1.5	1.0
Chromium	5	mg/kg	10	9.9	11	15
Copper	5	mg/kg	64	28	26	19
Lead	5	mg/kg	430	61	150	97
Nickel	5	mg/kg	< 5	< 5	< 5	5.4
Zinc	5	mg/kg	86	150	380	370
Sample Properties					·	
% Moisture	1	%	14	16	13	16



Client Sample ID Sample Matrix Eurofins Sample No.				Soil S24-Se0052822		
Date Sampled Test/Reference	LOR	Unit	Sep 18, 2024	Sep 18, 2024	Sep 18, 2024	Sep 18, 2024
Heavy Metals	LON	Offic				
Arsenic	2	mg/kg	59	5.6	45	71
Cadmium	0.4	mg/kg	4.2	0.5	16	0.7
Chromium	5	mg/kg	13	13	27	13
Copper	5	mg/kg	300	32	180	160
Lead	5	mg/kg	2800	56	860	2500
Nickel	5	mg/kg	< 5	< 5	8.3	< 5
Zinc	5	mg/kg	920	280	4500	530
Sample Properties						
% Moisture	1	%	57	22	24	15

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			HA7_0.0 Soil S24-Se0052825 Sep 18, 2024	Soil S24-Se0052826	HA8_0.0 Soil S24-Se0052827 Sep 18, 2024	HA8_0.5 Soil S24-Se0052828 Sep 18, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	31	32	45	33
Cadmium	0.4	mg/kg	20	2.6	16	15
Chromium	5	mg/kg	7.5	21	28	14
Copper	5	mg/kg	150	34	140	370
Lead	5	mg/kg	600	160	1200	940
Nickel	5	mg/kg	8.7	< 5	8.9	12
Zinc	5	mg/kg	4100	720	3500	4500
Sample Properties						
% Moisture	1	%	62	14	16	18

Client Sample ID			HA9_0.0	HA9_0.5	HA10_0.0	HA10_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Se0052829	S24-Se0052830	S24-Se0052831	S24-Se0052832
Date Sampled			Sep 18, 2024	Sep 18, 2024	Sep 18, 2024	Sep 18, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	34	150	23	6.6
Cadmium	0.4	mg/kg	3.8	1.9	1.2	1.4
Chromium	5	mg/kg	13	5.7	13	19
Copper	5	mg/kg	130	140	92	66
Lead	5	mg/kg	890	3400	660	97
Nickel	5	mg/kg	16	< 5	< 5	7.1
Zinc	5	mg/kg	900	940	380	800
Sample Properties						
% Moisture	1	%	15	23	23	27



Client Sample ID Sample Matrix Eurofins Sample No.			Soil	HA12_0.0 Soil S24-Se0052834	HA12_0.5 Soil S24-Se0052835	HA13_0.0 Soil S24-Se0052836
Date Sampled			Sep 18, 2024	Sep 18, 2024	Sep 18, 2024	Sep 18, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	23	17	26	8.9
Cadmium	0.4	mg/kg	2.1	1.1	3.5	0.5
Chromium	5	mg/kg	26	10	11	6.0
Copper	5	mg/kg	130	46	120	63
Lead	5	mg/kg	1100	250	900	180
Nickel	5	mg/kg	18	< 5	< 5	< 5
Zinc	5	mg/kg	1200	450	1000	180
Sample Properties						
% Moisture	1	%	46	10	19	12

Client Sample ID			HA14_0.0	TP1_0.0	TP1_0.5	TP1_1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Se0052837	S24-Se0052838	S24-Se0052839	S24-Se0052840
Date Sampled			Sep 18, 2024	Sep 17, 2024	Sep 17, 2024	Sep 17, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	160	180	310	430
Cadmium	0.4	mg/kg	< 0.4	26	64	14
Chromium	5	mg/kg	6.6	8.9	13	12
Copper	5	mg/kg	55	340	600	440
Lead	5	mg/kg	280	7700	20000	9100
Nickel	5	mg/kg	< 5	8.2	9.0	7.5
Zinc	5	mg/kg	86	24000	31000	6300
Sample Properties						
% Moisture	1	%	6.3	12	13	18

Client Sample ID			TP1_1.5	TP1_2.0	TP1_2.5	TP1_3.0	
Sample Matrix			Soil	Soil	Soil	Soil	
Eurofins Sample No.			S24-Se0052841	S24-Se0052842	S24-Se0052843	S24-Se0052844	
Date Sampled			Sep 17, 2024	Sep 17, 2024	Aug 17, 2024	Aug 17, 2024	
Test/Reference	LOR	Unit					
Heavy Metals							
Arsenic	2	mg/kg	120	100	36	35	
Cadmium	0.4	mg/kg	2.8	9.3	8.4	5.5	
Chromium	5	mg/kg	17	16	12	16	
Copper	5	mg/kg	140	150	87	72	
Lead	5	mg/kg	4100	2400	1100	670	
Nickel	5	mg/kg	6.3	9.1	5.7	5.4	
Zinc	5	mg/kg	1400	4100	3900	2400	
Sample Properties							
% Moisture	1	%	17	17	17	18	



Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled				TP2_0.5 Soil S24-Se0052846 Aug 17, 2024	TP2_1.0 Soil S24-Se0052847 Aug 17, 2024	TP2_1.5 Soil S24-Se0052848 Aug 17, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	28	12	19	14
Cadmium	0.4	mg/kg	3.5	2.2	3.4	1.5
Chromium	5	mg/kg	28	17	19	18
Copper	5	mg/kg	260	150	220	170
Lead	5	mg/kg	1700	640	1000	480
Nickel	5	mg/kg	11	12	12	13
Zinc	5	mg/kg	5000	2500	2100	860
Sample Properties						
% Moisture	1	%	13	12	12	13

Client Sample ID			TP2_2.0	TP3_0.0	TP3_0.5	TP3_1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Se0052849	S24-Se0052850	S24-Se0052851	S24-Se0052852
Date Sampled			Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	Aug 17, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	25	61	230	260
Cadmium	0.4	mg/kg	2.4	24	3.2	1.6
Chromium	5	mg/kg	28	27	7.5	9.0
Copper	5	mg/kg	220	570	1100	780
Lead	5	mg/kg	490	5200	32000	17000
Nickel	5	mg/kg	14	27	5.6	6.9
Zinc	5	mg/kg	2300	7700	1400	860
Sample Properties						
% Moisture	1	%	12	7.4	13	16

Client Sample ID			TP3_1.5	TP3_2.0	TP3_2.5	TP4_0.0	
Sample Matrix			Soil	Soil	Soil	Soil	
Eurofins Sample No.			S24-Se0052853	S24-Se0052854	S24-Se0052855	S24-Se0052856	
Date Sampled			Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	
Test/Reference	LOR	Unit					
Heavy Metals							
Arsenic	2	mg/kg	230	81	37	69	
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	6.6	
Chromium	5	mg/kg	7.0	13	9.5	42	
Copper	5	mg/kg	220	320	240	690	
Lead	5	mg/kg	620	2600	400	8700	
Nickel	5	mg/kg	< 5	7.8	5.1	26	
Zinc	5	mg/kg	170	210	200	2100	
Sample Properties							
% Moisture	1	%	17	18	16	11	



Client Sample ID Sample Matrix			TP4_0.5 Soil	TP4_1.0 Soil	TP4_1.5 Soil	TP4_2.0 Soil	
Eurofins Sample No.			S24-Se0052857	S24-Se0052858	S24-Se0052859	S24-Se0052860	
Date Sampled			Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	
Test/Reference	LOR	Unit					
Heavy Metals							
Arsenic	2	mg/kg	19	7.6	6.5	12	
Cadmium	0.4	mg/kg	3.6	2.5	2.6	3.8	
Chromium	5	mg/kg	9.9	7.9	8.1	7.7	
Copper	5	mg/kg	170	210	89	160	
Lead	5	mg/kg	520	290	30	350	
Nickel	5	mg/kg	12	7.7	6.2	12	
Zinc 5		mg/kg	1300	1100	1600	1400	
Sample Properties							
% Moisture	1	%	15	13	21	11	

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			TP5_0.0 Soil S24-Se0052861 Aug 17, 2024		TP5_1.0 Soil S24-Se0052863 Aug 17, 2024	TP5_1.5 Soil S24-Se0052864 Aug 17, 2024
Test/Reference	LOR	Unit				
Heavy Metals	·					
Arsenic	2	mg/kg	37	49	37	30
Cadmium	0.4	mg/kg	24	27	15	< 0.4
Chromium	5	mg/kg	26	50	14	12
Copper	5	mg/kg	410	380	490	37
Lead	5	mg/kg	2800	2800	2000	440
Nickel	5	mg/kg	24	33	14	< 5
Zinc	5	mg/kg	8500	7700	4700	150
Sample Properties						
% Moisture	1	%	17	17	14	16

Client Sample ID			TP5_2.0	TP5_2.5	TP6_0.0	TP6_0.5	
Sample Matrix			Soil	Soil	Soil	Soil	
Eurofins Sample No.			S24-Se0052865	S24-Se0052866	S24-Se0052867	S24-Se0052868	
Date Sampled			Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	
Test/Reference	LOR	Unit					
Heavy Metals							
Arsenic	2	mg/kg	14	33	110	53	
Cadmium	0.4	mg/kg	< 0.4	0.6	17	7.9	
Chromium	5	mg/kg	19	17	11	17	
Copper	5	mg/kg	32	75	420	180	
Lead	5	mg/kg	29	790	9500	3500	
Nickel	5	mg/kg	7.5	9.0	7.2	9.1	
Zinc	5	mg/kg	75	190	11000	3000	
Sample Properties	Sample Properties						
% Moisture	1	%	14	15	12	13	



Client Sample ID			TP6_1.0	TP6_1.5	TP6_2.0	TP6_2.5	
Sample Matrix			Soil	Soil	Soil	Soil	
Eurofins Sample No.			S24-Se0052869	S24-Se0052870	S24-Se0052871	S24-Se0052872	
Date Sampled			Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	
Test/Reference	LOR	Unit					
Heavy Metals							
Arsenic	2	mg/kg	47	27	16	29	
Cadmium	0.4	mg/kg	5.6	2.7	1.4	3.7	
Chromium	5	mg/kg	16	14	13	14	
Copper	5	mg/kg	120	66	86	100	
Lead	5	mg/kg	1900	590	300	850	
Nickel	5	mg/kg	12	7.4	< 5	6.7	
Zinc	5	mg/kg	1800	760	480	860	
Sample Properties							
% Moisture	1	%	13	16	16	16	

Client Sample ID			TP6_3.0	D01_20240917	D02_20240917	D03_20240917	
Sample Matrix			Soil	Soil	Soil	Soil	
Eurofins Sample No.			S24-Se0052873	S24-Se0052874	S24-Se0052875	S24-Se0052876	
Date Sampled			Aug 17, 2024	Aug 17, 2024	Aug 17, 2024	Aug 18, 2024	
Test/Reference	LOR	Unit					
Heavy Metals							
Arsenic	2	mg/kg	14	12	11	58	
Cadmium	0.4	mg/kg	3.1	2.5	1.2	26	
Chromium	5	mg/kg	13	16	17	30	
Copper	5	mg/kg	140	150	53	530	
Lead	5	mg/kg	150	470	120	5100	
Nickel	5	mg/kg	< 5	9.4	5.6	26	
Zinc	5	mg/kg	600	1300	670	9400	
Sample Properties	•						
% Moisture	1	%	15	12	24	17	



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Sydney	Sep 26, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Sep 20, 2024	14 Days

- Method: LTM-GEN-7080 Moisture



ABN: 50 005 085 521

Melbourne Geelong Sydney 6 Monterey Road Dandenong South Grovedale Girraween VIC 3175 VIC 3216 NSW 2145 +61 3 8564 5000 +61 2 9900 8400 +61 3 8564 5000 NATA# 1261 NATA# 1261 NATA# 1261

Site# 18217

Site# 25403

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Canberra

Mitchell

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Address

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web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

ABN: 91 05 0159 898

1141337 02 9954 8118

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217							Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set
	rnal Laboratory		Site # 1821/			Х		Χ	Α	Α		_^	Х
No	Sample ID	Sample Date	Sampling	Matrix	LAB ID								
	oumpie ib	Gample Bute	Time	Matrix	LABIB								
1	HA1_0.0	Aug 17, 2024		Soil	S24-Se0052813	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
2	HA1_0.5	Aug 17, 2024		Soil	S24-Se0052814	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
3	HA2_0.0	Aug 17, 2024		Soil	S24-Se0052815	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
4	HA2_0.5	Aug 17, 2024		Soil	S24-Se0052816	Χ	Х	Χ	Χ	Х	Χ	Х	Х
5	HA3_0.0	Aug 17, 2024		Soil	S24-Se0052817	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
6	HA3_0.5	Aug 17, 2024		Soil	S24-Se0052818	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
7	HA4_0.0	Aug 17, 2024		Soil	S24-Se0052819	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
8	HA4_0.5	Aug 17, 2024		Soil	S24-Se0052820	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
9	HA5_0.0	Sep 18, 2024		Soil	S24-Se0052821	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
10	HA5_0.5	Sep 18, 2024		Soil	S24-Se0052822	Χ	Χ	Χ	Χ	Х	Χ	Х	Х
11	HA6_0.0	Sep 18, 2024		Soil	S24-Se0052823	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
12	HA6_0.5	Sep 18, 2024		Soil	S24-Se0052824	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
13	HA7_0.0	Sep 18, 2024		Soil	S24-Se0052825	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
14	HA7_0.5	Sep 18, 2024		Soil	S24-Se0052826	Χ	Х	Χ	Χ	Χ	Χ	Х	Х



ABN: 50 005 085 521

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Site# 25403

Sydney Canberra 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Girraween Mitchell NSW 2145 ACT 2911 +61 2 9900 8400 +61 2 6113 8091 NATA# 1261 NATA# 1261 Site# 18217 Site# 25466

Brisbane Newcastle Murarrie Mayfield West QLD 4172 NSW 2304 T: +61 7 3902 4600 +61 2 4968 8448 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

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Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

ABN: 91 05 0159 898

1141337 02 9954 8118

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

	Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217							Chromium	Copper	Lead	Nickel	Zinc	Moisture Set
Sydr	ney Laboratory	- NATA # 1261	Site # 18217	•	1	Χ	Х	Х	Χ	Χ	Х	Х	Х
15	HA8_0.0	Sep 18, 2024		Soil	S24-Se0052827	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
16	HA8_0.5	Sep 18, 2024		Soil	S24-Se0052828	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
17	HA9_0.0	Sep 18, 2024		Soil	S24-Se0052829	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
18	HA9_0.5	Sep 18, 2024		Soil	S24-Se0052830	Χ	Χ	Х	Χ	Χ	Χ	Х	Х
19	HA10_0.0	Sep 18, 2024		Soil	S24-Se0052831	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
20	HA10_0.5	Sep 18, 2024		Soil	S24-Se0052832	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
21	HA11_0.0	Sep 18, 2024		Soil	S24-Se0052833	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
22	HA12_0.0	Sep 18, 2024		Soil	S24-Se0052834	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
23	HA12_0.5	Sep 18, 2024		Soil	S24-Se0052835	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
24	HA13_0.0	Sep 18, 2024		Soil	S24-Se0052836	Χ	Χ	Χ	Χ	Χ	Х	Х	Х
25	HA14_0.0	Sep 18, 2024		Soil	S24-Se0052837	Χ	Χ	Χ	Χ	Χ	Х	Х	Х
26	TP1_0.0	Sep 17, 2024		Soil	S24-Se0052838	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х
27	TP1_0.5	Sep 17, 2024		Soil	S24-Se0052839	Х	Х	Х	Χ	Х	Х	Х	Х
28	TP1_1.0	Sep 17, 2024		Soil	S24-Se0052840	Χ	Х	Х	Χ	Х	Х	Х	Х
29	TP1_1.5	Sep 17, 2024		Soil	S24-Se0052841	Χ	Х	Х	Χ	Х	Х	Х	Х
30	TP1_2.0	Sep 17, 2024		Soil	S24-Se0052842	Χ	Х	Х	Χ	Х	Х	Х	Х
31	TP1_2.5	Aug 17, 2024		Soil	S24-Se0052843	Χ	Х	Χ	Χ	Х	Х	Х	Х



ABN: 50 005 085 521

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Site# 25403

Site# 18217

Site# 25466

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+64 9 526 4551

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Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Site# 2370 Order No.: Report #:

Perth

1141337 02 9954 8118

ABN: 47 009 120 549

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Welshpool

WA 6106

NATA# 2561

Site# 2554

46-48 Banksia Road

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

	Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217							Chromium	Copper	Lead	Nickel	Zinc	Moisture Set
Sydı	ey Laboratory	- NATA # 1261	Site # 18217	,		Х	Х	Χ	Χ	Х	Χ	Χ	Х
32	TP1_3.0	Aug 17, 2024		Soil	S24-Se0052844	Х	Х	Х	Χ	Χ	Χ	Χ	Х
33	TP2_0.0	Aug 17, 2024		Soil	S24-Se0052845	Х	Х	Х	Χ	Χ	Χ	Χ	Х
34	TP2_0.5	Aug 17, 2024		Soil	S24-Se0052846	Х	Х	Χ	Χ	Χ	Χ	Χ	Х
35	TP2_1.0	Aug 17, 2024		Soil	S24-Se0052847	Х	Х	Χ	Χ	Х	Χ	Χ	Х
36	TP2_1.5	Aug 17, 2024		Soil	S24-Se0052848	Х	Х	Χ	Χ	Χ	Χ	Χ	Х
37	TP2_2.0	Aug 17, 2024		Soil	S24-Se0052849	Х	Х	Х	Х	Х	Х	Χ	Х
38	TP3_0.0	Aug 17, 2024		Soil	S24-Se0052850	Х	Х	Х	Х	Х	Χ	Χ	Х
39	TP3_0.5	Aug 17, 2024		Soil	S24-Se0052851	Х	Х	Х	Χ	Х	Х	Χ	Х
40	TP3_1.0	Aug 17, 2024		Soil	S24-Se0052852	Х	Х	Χ	Χ	Χ	Х	Χ	Х
41	TP3_1.5	Aug 17, 2024		Soil	S24-Se0052853	Х	Х	Χ	Х	Х	Х	Χ	Х
42	TP3_2.0	Aug 17, 2024		Soil	S24-Se0052854	Х	Х	Χ	Χ	Х	Х	Χ	Х
43	TP3_2.5	Aug 17, 2024		Soil	S24-Se0052855	Х	Х	Χ	Х	Χ	Χ	Χ	Х
44	TP4_0.0	Aug 17, 2024		Soil	S24-Se0052856	Х	Х	Х	Х	Χ	Х	Χ	Х
45	TP4_0.5	Aug 17, 2024		Soil	S24-Se0052857	Х	Х	Χ	Χ	Χ	Χ	Χ	Х
46	TP4_1.0	Aug 17, 2024		Soil	S24-Se0052858	Х	Х	Х	Х	Х	Х	Χ	Х
47	TP4_1.5	Aug 17, 2024		Soil	S24-Se0052859	Х	Х	Х	Χ	Х	Х	Χ	Х
48	TP4_2.0	Aug 17, 2024		Soil	S24-Se0052860	Х	Х	Х	Х	Х	Х	Χ	Х



Site# 25403

ABN: 50 005 085 521

Melbourne 6 Monterey Road Dandenong South Grovedale VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254

Geelong Sydney 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Girraween VIC 3216 NSW 2145 +61 2 9900 8400 +61 3 8564 5000 NATA# 1261 NATA# 1261

Site# 18217

Canberra Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466

Brisbane Newcastle Murarrie QLD 4172 NSW 2304 T: +61 7 3902 4600 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

Mayfield West +61 2 4968 8448 ABN: 47 009 120 549

> Perth ProMicro 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2561 Site# 2554

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Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Site# 2370 Order No.: Report #:

Perth

Welshpool

NATA# 2377

WA 6106

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Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

	Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217							Chromium	Copper	Lead	Nickel	Zinc	Moisture Set
Sydı	ney Laboratory	- NATA # 1261	Site # 18217	'		Х	Х	Χ	Х	Х	Χ	Χ	Х
49	TP5_0.0	Aug 17, 2024		Soil	S24-Se0052861	Х	Х	Χ	Х	Х	Х	Χ	Х
50	TP5_0.5	Aug 17, 2024		Soil	S24-Se0052862	Х	Х	Χ	Х	Х	Χ	Χ	Х
51	TP5_1.0	Aug 17, 2024		Soil	S24-Se0052863	Х	Х	Χ	Х	Х	Х	Χ	Х
52	TP5_1.5	Aug 17, 2024		Soil	S24-Se0052864	Х	Х	Х	Х	Х	Х	Χ	Х
53	TP5_2.0	Aug 17, 2024		Soil	S24-Se0052865	Х	Х	Χ	Χ	Х	Х	Χ	Х
54	TP5_2.5	Aug 17, 2024		Soil	S24-Se0052866	Х	Х	Χ	Х	Х	Χ	Χ	Х
55	TP6_0.0	Aug 17, 2024		Soil	S24-Se0052867	Х	Х	Χ	Х	Х	Χ	Χ	Х
56	TP6_0.5	Aug 17, 2024		Soil	S24-Se0052868	Х	Х	Χ	Х	Х	Χ	Χ	Х
57	TP6_1.0	Aug 17, 2024		Soil	S24-Se0052869	Х	Х	Χ	Х	Х	Χ	Χ	Х
58	TP6_1.5	Aug 17, 2024		Soil	S24-Se0052870	Х	Х	Χ	Х	Х	Χ	Χ	Х
59	TP6_2.0	Aug 17, 2024		Soil	S24-Se0052871	Х	Х	Χ	Х	Х	Χ	Χ	Х
60	TP6_2.5	Aug 17, 2024		Soil	S24-Se0052872	Х	Х	Χ	Х	Х	Х	Χ	Х
61	TP6_3.0	Aug 17, 2024		Soil	S24-Se0052873	Х	Х	Х	Х	Х	Х	Х	Х
62	D01_2024091 7	Aug 17, 2024		Soil	S24-Se0052874	Х	Х	Х	Х	Х	Х	Х	х
63	D02_2024091 7	Aug 17, 2024		Soil	S24-Se0052875	Х	Х	Х	Х	Х	Х	Х	х



ABN: 50 005 085 521

Melbourne Geelong Sydney Canberra 6 Monterey Road Dandenong South Grovedale Girraween Mitchell VIC 3175 VIC 3216 NSW 2145 ACT 2911 +61 3 8564 5000 +61 2 9900 8400 +61 3 8564 5000 NATA# 1261 NATA# 1261 NATA# 1261 NATA# 1261 Site# 1254 Site# 25403 Site# 18217 Site# 25466

Brisbane Newcastle 19/8 Lewalan Street 179 Magowar Road Unit 1.2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Murarrie QLD 4172 NSW 2304 T: +61 7 3902 4600 +61 2 6113 8091 NATA# 1261 NATA# 1261

Site# 20794 & 2780

Chro

Сор Lead

Perth 46-48 Banksia Road Mayfield West Welshpool WA 6106 +61 2 4968 8448 +61 8 6253 4444 NATA# 2377 Site# 2370 Site# 25079

ABN: 47 009 120 549 NZBN: 9429046024954

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Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

Fax:

Nick Zinc

ABN: 91 05 0159 898

1141337 02 9954 8118

Phone: 02 9954 8150 Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

Sydney Laboratory - NATA # 1261 Site # 18217 X X X X X X	Х	Х	Х	Х
64 D03_2024091 Aug 18, 2024 Soil S24-Se0052876 X X X X X	X	Х	Х	х
65 R01_2024091 Aug 17, 2024 Water S24-Se0052877 x x x x x	Х	Х	Х	
66 R02_2024091 Sep 18, 2024 Water S24-Se0052878 x x x x x	Х	Х	Х	
Test Counts 66 66 66 66 66 66	66	66	66	64



Internal Quality Control Review and Glossary

General

- 1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request
- 2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
- 3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
- 4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
- Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
- 7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
- 8. Samples were analysed on an 'as received' basis.
- 9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
- 10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date: therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days

Units

mg/kg: milligrams per kilogram mg/L: milligrams per litre ppm: parts per million μg/L: micrograms per litre ppb: parts per billion %: Percentage

org/100 mL: Organisms per 100 millilitres NTU: Nephelometric Turbidity Units MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Colour: Pt-Co Units (CU) CFU: Colony Forming Unit

Terms

APHA American Public Health Association CEC Cation Exchange Capacity COC Chain of Custody

CP Client Parent - QC was performed on samples pertaining to this report CRM Certified Reference Material (ISO17034) - reported as percent recovery.

Dry Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis

Duplicate A second piece of analysis from the same sample and reported in the same units as the result to show comparison.

LOR Limit of Reporting

LCS Laboratory Control Sample - reported as percent recovery.

Method Blank In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water NCP Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.

RPD Relative Percent Difference between two Duplicate pieces of analysis SPIKE Addition of the analyte to the sample and reported as percentage recovery

SRA Sample Receipt Advice

The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria Surr - Surrogate

Tributyltin oxide (bis-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits. TRTO

TCI P Toxicity Characteristic Leaching Procedure TEQ Toxic Equivalency Quotient or Total Equivalence

QSM US Department of Defense Quality Systems Manual Version 6.0

US EPA United States Environmental Protection Agency

Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA WA DWER

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50% Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 - 150%, VOC recoveries 50 - 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

- 1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
- 3. pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- 4. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte
- 5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data



Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Heavy Metals						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
Copper	mg/kg	< 5		5	Pass	
Lead	mg/kg	< 5		5	Pass	
Nickel	mg/kg	< 5		5	Pass	
Zinc	mg/kg	< 5		5	Pass	
Method Blank						
Heavy Metals						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
Copper	mg/kg	< 5		5	Pass	
Lead	mg/kg	< 5		5	Pass	
Nickel	mg/kg	< 5		5	Pass	
Zinc	mg/kg	< 5		5	Pass	
Method Blank						
Heavy Metals						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
Copper	mg/kg	< 5		5	Pass	
Lead	mg/kg	< 5		5	Pass	
Nickel	mg/kg	< 5		5	Pass	
Zinc	mg/kg	< 5		5	Pass	
Method Blank	1 3 3	-				
Heavy Metals						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
Copper	mg/kg	< 5		5	Pass	
Lead	mg/kg	< 5		5	Pass	
Nickel	mg/kg	< 5		5	Pass	
Zinc	mg/kg	< 5		5	Pass	
Method Blank	1 3 3	-				
Heavy Metals						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
Copper	mg/kg	< 5		5	Pass	
Lead	mg/kg	< 5		5	Pass	
Nickel	mg/kg	< 5		5	Pass	
Zinc	mg/kg	< 5		5	Pass	
Method Blank						
Heavy Metals						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
		, , ,	i l		. 433	
Copper	mg/kg	< 5		5	Pass	



Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Nickel	mg/kg	< 5	5	Pass	
Zinc	mg/kg	< 5	5	Pass	
Method Blank			· · · · · · · · · · · · · · · · · · ·		
Heavy Metals					
Arsenic	mg/kg	< 2	2	Pass	
Cadmium	mg/kg	< 0.4	0.4	Pass	
Chromium	mg/kg	< 5	5	Pass	
Copper	mg/kg	< 5	5	Pass	
Lead	mg/kg	< 5	5	Pass	
Nickel	mg/kg	< 5	5	Pass	
Zinc	mg/kg	< 5	5	Pass	
Method Blank	IIIg/Ng		J	1 455	
Heavy Metals					
Arsenic	mg/kg	< 2	2	Pass	
Cadmium		< 0.4	0.4	Pass	
Chromium	mg/kg		5	Pass	
Copper	mg/kg	< 5			
	mg/kg	< 5	5	Pass	
Lead	mg/kg	< 5	5	Pass	
Nickel	mg/kg	< 5	5	Pass	
Zinc	mg/kg	< 5	5	Pass	
LCS - % Recovery		l I			
Heavy Metals					
Arsenic	%	99	80-120	Pass	
Cadmium	%	97	80-120	Pass	
Chromium	%	97	80-120	Pass	
Copper	%	96	80-120	Pass	
Lead	%	94	80-120	Pass	
Nickel	%	97	80-120	Pass	
Zinc	%	95	80-120	Pass	
LCS - % Recovery					
Heavy Metals					
Arsenic	%	97	80-120	Pass	
Cadmium	%	97	80-120	Pass	
Chromium	%	96	80-120	Pass	
Copper	%	97	80-120	Pass	
Lead	%	93	80-120	Pass	
Nickel	%	97	80-120	Pass	
Zinc	%	96	80-120	Pass	
LCS - % Recovery					
Heavy Metals					
Arsenic	%	94	80-120	Pass	
Cadmium	%	95	80-120	Pass	
Chromium	%	94	80-120	Pass	
Copper	%	94	80-120	Pass	
Lead	%	91	80-120	Pass	
Nickel	%	93	80-120	Pass	
Zinc	%	90	80-120	Pass	
LCS - % Recovery			30 120	. 455	
Heavy Metals					
Arsenic	%	96	80-120	Pass	
Cadmium	%	97	80-120	Pass	
Odumium		95	80-120	Pass	
Chromium	1 0/				i .
Chromium Copper	% %	94	80-120	Pass	



Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Nickel			%	93		80-120	Pass	
Zinc			%	93		80-120	Pass	
LCS - % Recovery								
Heavy Metals								
Arsenic			%	93		80-120	Pass	
Cadmium			%	93		80-120	Pass	
Chromium			%	90		80-120	Pass	
Copper			%	89		80-120	Pass	
Lead			%	88		80-120	Pass	
Nickel			%	89		80-120	Pass	
Zinc			%	91		80-120	Pass	
LCS - % Recovery								
Heavy Metals								
Arsenic			%	93		80-120	Pass	
Cadmium			%	99		80-120	Pass	
Chromium			%	104		80-120	Pass	
Copper			%	111		80-120	Pass	
Lead			%	115		80-120	Pass	
Nickel			%	105		80-120	Pass	
Zinc			%	113		80-120	Pass	
LCS - % Recovery			70			00 .20	. 455	
Heavy Metals								
Arsenic			%	93		80-120	Pass	
Cadmium			%	93		80-120	Pass	
Chromium			%	92		80-120	Pass	
Copper			%	91		80-120	Pass	
Lead			%	89		80-120	Pass	
Nickel			%	92		80-120	Pass	
Zinc			%	92		80-120	Pass	
			/0	1 92		00-120	rass	
LCS - % Recovery Heavy Metals					Т	T		
Arsenic			%	101		80-120	Pass	
Cadmium			%				Pass	
Chromium				111		80-120		
Copper			%	110 113		80-120 80-120	Pass	
							Pass	
Lead			%	111		80-120	Pass	
Nickel			%	112		80-120	Pass	
Zinc			%	111		80-120	Pass	0
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Heavy Metals				Result 1				
Lead	S24-Se0054977	NCP	%	80		75-125	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S24-Se0052815	СР	%	104		75-125	Pass	
Cadmium	S24-Se0052815	CP	%	93		75-125	Pass	
Chromium	S24-Se0052815	CP	%	97		75-125	Pass	
Nickel	S24-Se0052815	CP	%	103		75-125	Pass	
Zinc	S24-Se0052815	CP	%	122		75-125	Pass	
Spike - % Recovery	52. 500052010	J.	,,,					
Heavy Metals				Result 1				
Chromium	S24-Se0052823	СР	%	81		75-125	Pass	
Copper	S24-Se0052823	CP	%	123		75-125	Pass	
Nickel	S24-Se0052823	CP	%	84		75-125 75-125	Pass	
INICKEI	324-3 6 0032823	UP	7/0	04		10-120	rass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									5500
Heavy Metals				Result 1					
Arsenic	S24-Se0052843	СР	%	108			75-125	Pass	
Copper	S24-Se0052843	СР	%	94			75-125	Pass	
Nickel	S24-Se0052843	СР	%	95			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Se0052822	СР	mg/kg	5.6	4.6	18	30%	Pass	
Cadmium	S24-Se0052822	СР	mg/kg	0.5	0.7	36	30%	Fail	Q15
Chromium	S24-Se0052822	СР	mg/kg	13	13	4.0	30%	Pass	
Copper	S24-Se0052822	СР	mg/kg	32	36	13	30%	Pass	
Lead	S24-Se0052822	СР	mg/kg	56	49	14	30%	Pass	
Nickel	S24-Se0052822	СР	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S24-Se0052822	СР	mg/kg	280	290	5.0	30%	Pass	
Duplicate		-	3 3						
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S24-Se0052822	СР	%	22	21	1.0	30%	Pass	
Duplicate	02.000002022	<u> </u>	,,,				0070		
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Se0052832	СР	mg/kg	6.6	7.9	18	30%	Pass	
Cadmium	S24-Se0052832	CP	mg/kg	1.4	0.9	44	30%	Fail	Q15
Chromium	S24-Se0052832	CP	mg/kg	19	21	7.0	30%	Pass	Q.10
Copper	S24-Se0052832	CP	mg/kg	66	62	6.0	30%	Pass	
Lead	S24-Se0052832	CP	mg/kg	97	88	9.0	30%	Pass	
Nickel	S24-Se0052832	CP	mg/kg	7.1	8.9	22	30%	Pass	
Zinc	S24-Se0052832	CP	mg/kg	800	770	4.0	30%	Pass	
Duplicate	024 000002002	<u> </u>	ilig/kg	1 000	170	7.0	3070	1 433	
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S24-Se0052832	СР	%	27	25	9.0	30%	Pass	
Duplicate	024 000002002	<u> </u>	70			3.0	3070	1 433	
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S24-Se0052842	СР	%	17	17	3.0	30%	Pass	
Duplicate	324-360032042		/0	17	17	3.0	3078	1 033	
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Se0052862	СР	mg/kg	49	45	9.0	30%	Pass	
Cadmium	S24-Se0052862	CP	mg/kg	27	25	8.0	30%	Pass	
Chromium	S24-Se0052862	CP	mg/kg	50	24	71	30%	Fail	Q15
Copper	S24-Se0052862	CP	mg/kg	380	460	20	30%	Pass	QIJ
Lead	S24-Se0052862	CP	mg/kg	2800	2500	13	30%	Pass	
Nickel	S24-Se0052862	CP	mg/kg	33	19	53	30%	Fail	Q15
Zinc	S24-Se0052862	CP	mg/kg	7700	7400	5.0	30%	Pass	QIS
Duplicate	324-360032002	_ CF	ilig/kg	1700	7400	3.0	30 %	rass_	
Sample Properties				Result 1	Booult 2	DDD.			
	S24-Se0052862	СР	%		Result 2	RPD	200/	Pass	
% Moisture	524-560052662	L CP	70	17	17	2.0	30%	Pass	
Duplicate Heavy Motels				Descrit 4	Bosult 0	חחח			
Heavy Metals	C04 C0050070	CD	m = /I	Result 1	Result 2	RPD	200/	Doc-	
Arsenic	S24-Se0052872	CP	mg/kg	29	28	4.0	30%	Pass	
Cadmium	S24-Se0052872	CP	mg/kg	3.7	2.9	23	30%	Pass	
Chromium	S24-Se0052872	CP	mg/kg	14	12	12	30%	Pass	
Copper	S24-Se0052872	CP	mg/kg	100	99	5.0	30%	Pass	
Lead	S24-Se0052872	CP	mg/kg	850	670	24	30%	Pass	
Nickel	S24-Se0052872	CP	mg/kg	6.7	5.6	17	30%	Pass	
Zinc	S24-Se0052872	CP	mg/kg	860	970	12	30%	Pass	



Duplicate											
Sample Properties				Result 1	Result 2	RPD					
% Moisture	S24-Se0052872	CP	%	16	13	20	30%	Pass			



Comments

Sample Integrity

Custody Seals Intact (if used)

Attempt to Chill was evident

Yes
Sample correctly preserved

Appropriate sample containers have been used

Yes
Sample containers for volatile analysis received with minimal headspace

Yes
Samples received within HoldingTime

Yes
Some samples have been subcontracted

No

Qualifier Codes/Comments

Code Description

Q15 The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Black Analytical Services Manager
Mickael Ros Senior Analyst-Metal

Roopesh Rangarajan Senior Analyst-Sample Properties

Glenn Jackson Managing Director

Final Report - this report replaces any previously issued Report

- Indicates Not Requested
- * Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please $\underline{\text{click here.}}$

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



Ramboll Australia Pty Ltd Level 3/100 Pacific Highway North Sydney NSW 2060





NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: Stephen Maxwell

 Report
 1141337-W

 Project name
 318001968

 Project ID
 318001968

 Received Date
 Sep 19, 2024

Client Sample ID			R01_20240917	R02_20240918
Sample Matrix			Water	Water
Eurofins Sample No.			S24-Se0052877	S24-Se0052878
Date Sampled			Aug 17, 2024	Sep 18, 2024
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	0.001	mg/L	< 0.001	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001
Lead	0.001	mg/L	< 0.001	< 0.001
Nickel	0.001	mg/L	< 0.001	< 0.001
Zinc	0.005	mg/L	< 0.005	< 0.005



Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

DescriptionTesting SiteExtractedHolding TimeHeavy MetalsSydneySep 25, 202428 Days

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS



ABN: 50 005 085 521

Melbourne Geelong Sydney 6 Monterey Road Dandenong South Grovedale Girraween VIC 3175 VIC 3216 NSW 2145 +61 3 8564 5000 +61 2 9900 8400 +61 3 8564 5000 NATA# 1261 NATA# 1261 NATA# 1261

Site# 18217

Site# 25403

Canberra Brisbane 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Mitchell Murarrie ACT 2911 QLD 4172 T: +61 7 3902 4600 +61 2 6113 8091 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25466

Perth Newcastle 46-48 Banksia Road Mayfield West Welshpool NSW 2304 WA 6106 +61 2 4968 8448 +61 8 6253 4444 NATA# 1261 NATA# 2377 Site# 2370 Site# 25079

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NATA# 2561

Site# 2554

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Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

ABN: 91 05 0159 898

1141337 02 9954 8118

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

	Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217								Copper	Lead	Nickel	Zinc	Moisture Set
			Site # 18217	<u> </u>		Х	Х	Х	Х	Х	Х	Х	Х
	rnal Laboratory											\vdash	\vdash
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	HA1_0.0	Aug 17, 2024		Soil	S24-Se0052813	Х	Х	Х	Х	Х	Х	Х	Х
2	HA1_0.5	Aug 17, 2024		Soil	S24-Se0052814	Χ	Х	Х	Χ	Χ	Х	Х	Х
3	HA2_0.0	Aug 17, 2024		Soil	S24-Se0052815	Χ	Х	Χ	Χ	Х	Χ	Х	Х
4	HA2_0.5	Aug 17, 2024		Soil	S24-Se0052816	Х	Х	Х	Χ	Х	Χ	Х	Х
5	HA3_0.0	Aug 17, 2024		Soil	S24-Se0052817	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
6	HA3_0.5	Aug 17, 2024		Soil	S24-Se0052818	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
7	HA4_0.0	Aug 17, 2024		Soil	S24-Se0052819	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
8	HA4_0.5	Aug 17, 2024		Soil	S24-Se0052820	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
9	HA5_0.0	Sep 18, 2024		Soil	S24-Se0052821	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
10	HA5_0.5	Sep 18, 2024		Soil	S24-Se0052822	Х	Х	Х	Χ	Χ	Х	Х	Х
11	HA6_0.0	Sep 18, 2024		Soil	S24-Se0052823	Х	Х	Χ	Χ	Χ	Χ	Х	Х
12	HA6_0.5	Sep 18, 2024		Soil	S24-Se0052824	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
13	HA7_0.0	Sep 18, 2024		Soil	S24-Se0052825	Χ	Х	Χ	Χ	Χ	Χ	Х	Х
14	HA7_0.5	Sep 18, 2024		Soil	S24-Se0052826	Χ	Х	Χ	Χ	Χ	Χ	Х	Х



ABN: 50 005 085 521

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Site# 25403

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Brisbane Newcastle Murarrie Mayfield West QLD 4172 NSW 2304 T: +61 7 3902 4600 +61 2 4968 8448 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

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ABN: 47 009 120 549

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Address

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web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

ABN: 91 05 0159 898

1141337 02 9954 8118

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

	Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217								Copper	Lead	Nickel	Zinc	Moisture Set
Sydı	ney Laboratory	- NATA # 1261	Site # 18217	, 		Х	Х	Х	Х	Х	Х	Х	Х
15	HA8_0.0	Sep 18, 2024		Soil	S24-Se0052827	Х	Х	Х	Х	Х	Х	Х	Х
16	HA8_0.5	Sep 18, 2024		Soil	S24-Se0052828	Х	Х	Х	Х	Х	Х	Х	Х
17	HA9_0.0	Sep 18, 2024		Soil	S24-Se0052829	Χ	Χ	Х	Х	Х	Χ	Х	Х
18	HA9_0.5	Sep 18, 2024		Soil	S24-Se0052830	Х	Х	Χ	Х	Х	Х	Х	Х
19	HA10_0.0	Sep 18, 2024		Soil	S24-Se0052831	Х	Х	Х	Х	Х	Х	Х	Х
20	HA10_0.5	Sep 18, 2024		Soil	S24-Se0052832	Х	Х	Х	Х	Х	Χ	Х	Х
21	HA11_0.0	Sep 18, 2024		Soil	S24-Se0052833	Χ	Х	Х	Х	Х	Х	Х	Х
22	HA12_0.0	Sep 18, 2024		Soil	S24-Se0052834	Х	Х	Χ	Х	Х	Х	Х	Х
23	HA12_0.5	Sep 18, 2024		Soil	S24-Se0052835	Χ	Х	Х	Х	Х	Χ	Х	Х
24	HA13_0.0	Sep 18, 2024		Soil	S24-Se0052836	Х	Х	Х	Х	Х	Х	Х	Х
25	HA14_0.0	Sep 18, 2024		Soil	S24-Se0052837	Х	Х	Х	Х	Х	Х	Х	Х
26	TP1_0.0	Sep 17, 2024		Soil	S24-Se0052838	Χ	Х	Χ	Х	Х	Χ	Х	Х
27	TP1_0.5	Sep 17, 2024		Soil	S24-Se0052839	Х	Х	Х	Х	Х	Х	Х	Х
28	TP1_1.0	Sep 17, 2024		Soil	S24-Se0052840	Х	Х	Χ	Х	Х	Х	Х	Х
29	TP1_1.5	Sep 17, 2024		Soil	S24-Se0052841	Х	Х	Х	Х	Х	Х	Х	Х
30	TP1_2.0	Sep 17, 2024		Soil	S24-Se0052842	Х	Х	Χ	Х	Х	Х	Х	Х
31	TP1_2.5	Aug 17, 2024		Soil	S24-Se0052843	Х	Χ	Χ	Х	Х	Х	Х	Х



Site# 25403

ABN: 50 005 085 521

Melbourne Geelong 6 Monterey Road Dandenong South Grovedale VIC 3175 VIC 3216 +61 3 8564 5000

Sydney Canberra 19/8 Lewalan Street 179 Magowar Road Unit 1,2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Girraween Mitchell NSW 2145 ACT 2911 +61 2 9900 8400 +61 3 8564 5000 +61 2 6113 8091 NATA# 1261 NATA# 1261 NATA# 1261

Site# 18217

Site# 25466

Brisbane Newcastle Murarrie Mayfield West QLD 4172 NSW 2304 T: +61 7 3902 4600 +61 2 4968 8448 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

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Site# 2554

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Address

email: EnviroSales@eurofins.com

web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

NATA# 1261

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

ABN: 91 05 0159 898

1141337 02 9954 8118

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

Sample Detail Sydney Laboratory - NATA # 1261 Site # 18217							Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set
Sydı	ney Laboratory	- NATA # 1261	Site # 18217	,		Х	Х	Χ	Χ	Х	Χ	Χ	Х
32	TP1_3.0	Aug 17, 2024		Soil	S24-Se0052844	Х	Х	Х	Χ	Χ	Χ	Χ	Х
33	TP2_0.0	Aug 17, 2024		Soil	S24-Se0052845	Х	Х	Х	Χ	Χ	Χ	Χ	Х
34	TP2_0.5	Aug 17, 2024		Soil	S24-Se0052846	Х	Х	Χ	Χ	Χ	Χ	Χ	Х
35	TP2_1.0	Aug 17, 2024		Soil	S24-Se0052847	Х	Х	Χ	Χ	Χ	Χ	Χ	Х
36	TP2_1.5	Aug 17, 2024		Soil	S24-Se0052848	Х	Х	Х	Χ	Х	Х	Χ	Х
37	TP2_2.0	Aug 17, 2024		Soil	S24-Se0052849	Х	Х	Χ	Χ	Χ	Χ	Χ	Х
38	TP3_0.0	Aug 17, 2024		Soil	S24-Se0052850	Х	Х	Χ	Х	Х	Χ	Χ	Х
39	TP3_0.5	Aug 17, 2024		Soil	S24-Se0052851	Х	Х	Х	Χ	Х	Х	Χ	Х
40	TP3_1.0	Aug 17, 2024		Soil	S24-Se0052852	Х	Х	Х	Х	Х	Х	Χ	Х
41	TP3_1.5	Aug 17, 2024		Soil	S24-Se0052853	Х	Х	Χ	Χ	Χ	Χ	Χ	Х
42	TP3_2.0	Aug 17, 2024		Soil	S24-Se0052854	Х	Х	Χ	Χ	Х	Χ	Χ	Х
43	TP3_2.5	Aug 17, 2024		Soil	S24-Se0052855	Х	Х	Χ	Х	Х	Х	Χ	Х
44	TP4_0.0	Aug 17, 2024		Soil	S24-Se0052856	Х	Х	Х	Х	Х	Х	Х	Х
45	TP4_0.5	Aug 17, 2024		Soil	S24-Se0052857	Х	Х	Х	Х	Х	Х	Х	Х
46	TP4_1.0	Aug 17, 2024		Soil	S24-Se0052858	Х	Х	Х	Х	Х	Х	Х	Х
47	TP4_1.5	Aug 17, 2024		Soil	S24-Se0052859	Х	Х	Х	Х	Х	Х	Х	Х
48	TP4_2.0	Aug 17, 2024		Soil	S24-Se0052860	Х	Х	Х	Х	Х	Х	Х	Х



ABN: 50 005 085 521

Melbourne Geelong Sydney 6 Monterey Road Dandenong South Grovedale Girraween VIC 3175 VIC 3216 NSW 2145 +61 3 8564 5000 +61 2 9900 8400 +61 3 8564 5000 NATA# 1261 NATA# 1261 NATA# 1261

Site# 18217

Site# 25403

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Canberra

Mitchell

ACT 2911

NATA# 1261

Site# 25466

Perth 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2377 Site# 2370

ABN: 47 009 120 549 Perth ProMicro 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444

NATA# 2561

Site# 2554

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web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

Site# 1254

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

ABN: 91 05 0159 898

1141337 02 9954 8118

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav Contact Name: Stephen Maxwell

Sample Detail							Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217							Х	Х	Х	Х	Х	Х	Х
49	TP5_0.0	Aug 17, 2024		Soil	S24-Se0052861	Х	Х	Х	Х	Х	Х	Х	Х
50	TP5_0.5	Aug 17, 2024		Soil	S24-Se0052862	Х	Х	Х	Х	Х	Х	Х	Х
51	TP5_1.0	Aug 17, 2024		Soil	S24-Se0052863	Х	Х	Х	Х	Х	Х	Х	Х
52	TP5_1.5	Aug 17, 2024		Soil	S24-Se0052864	Х	Х	Х	Х	Х	Х	Х	Х
53	TP5_2.0	Aug 17, 2024		Soil	S24-Se0052865	Х	Х	Х	Х	Х	Х	Х	Х
54	TP5_2.5	Aug 17, 2024		Soil	S24-Se0052866	Х	Х	Х	Х	Х	Х	Х	Х
55	TP6_0.0	Aug 17, 2024		Soil	S24-Se0052867	Х	Х	Х	Х	Х	Х	Х	Х
56	TP6_0.5	Aug 17, 2024		Soil	S24-Se0052868	Х	Х	Х	Х	Х	Х	Х	Х
57	TP6_1.0	Aug 17, 2024		Soil	S24-Se0052869	Х	Х	Х	Х	Х	Х	Х	Х
58	TP6_1.5	Aug 17, 2024		Soil	S24-Se0052870	Х	Х	Χ	Х	Х	Х	Х	Х
59	TP6_2.0	Aug 17, 2024		Soil	S24-Se0052871	Х	Х	Х	Х	Х	Х	Х	Х
60	TP6_2.5	Aug 17, 2024		Soil	S24-Se0052872	Х	Х	Х	Х	Х	Х	Х	Х
61	TP6_3.0	Aug 17, 2024		Soil	S24-Se0052873	Х	Х	Χ	Х	Х	Х	Х	Х
62	D01_2024091 7	Aug 17, 2024		Soil	S24-Se0052874	Х	Χ	Χ	Х	Х	Х	Х	Х
63	D02_2024091 7	Aug 17, 2024		Soil	S24-Se0052875	Х	Х	Х	Х	Х	Х	Х	Х



ABN: 50 005 085 521

Melbourne Geelong Sydney Canberra 6 Monterey Road 19/8 Lewalan Street 179 Magowar Road Unit 1.2 Dacre Street 1/21 Smallwood Place 1/2 Frost Drive Dandenong South Grovedale Girraween Mitchell VIC 3175 VIC 3216 NSW 2145 ACT 2911 +61 3 8564 5000 +61 2 9900 8400 +61 3 8564 5000 +61 2 6113 8091 NATA# 1261 NATA# 1261 NATA# 1261 NATA# 1261 Site# 1254 Site# 25403 Site# 18217 Site# 25466

Brisbane Newcastle Murarrie Mayfield West QLD 4172 NSW 2304 T: +61 7 3902 4600 +61 2 4968 8448 NATA# 1261 NATA# 1261 Site# 20794 & 2780 Site# 25079

> Сор Lead

Chro

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NATA# 2561

Site# 2554

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web: www.eurofins.com.au

Company Name: Ramboll Australia Pty Ltd Level 3/100 Pacific Highway

North Sydney NSW 2060

Project Name: Project ID:

318001968 318001968

Order No.: Report #:

Nick Zinc

1141337 02 9954 8118

Phone: 02 9954 8150 Fax:

Received: Sep 19, 2024 3:23 PM Sep 30, 2024 Due:

Priority: 7 Dav

Contact Name: Stephen Maxwell

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65	R01_2024091	Aug 17, 2024	Water	S24-Se0052877	Х	х	х	Х	Х	Х	Х	
66	R02_2024091	Sep 18, 2024	Water	S24-Se0052878	Х	Х	Х	Х	Х	Х	Х	
Test	est Counts							66	66	66	66	64



Internal Quality Control Review and Glossary

General

- 1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request
- 2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
- 3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
- 4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
- Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
- 7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
- 8. Samples were analysed on an 'as received' basis.
- 9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
- 10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date: therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days

Units

mg/kg: milligrams per kilogram mg/L: milligrams per litre ppm: parts per million μg/L: micrograms per litre ppb: parts per billion %: Percentage

org/100 mL: Organisms per 100 millilitres NTU: Nephelometric Turbidity Units MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Colour: Pt-Co Units (CU) CFU: Colony Forming Unit

Terms

TCI P

APHA American Public Health Association CEC Cation Exchange Capacity COC Chain of Custody

CP Client Parent - QC was performed on samples pertaining to this report CRM Certified Reference Material (ISO17034) - reported as percent recovery.

Dry Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis

Duplicate A second piece of analysis from the same sample and reported in the same units as the result to show comparison.

LOR Limit of Reporting

LCS Laboratory Control Sample - reported as percent recovery.

Method Blank In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water NCP Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.

RPD Relative Percent Difference between two Duplicate pieces of analysis SPIKE Addition of the analyte to the sample and reported as percentage recovery

SRA Sample Receipt Advice

The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria Surr - Surrogate

Tributyltin oxide (bis-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits. TRTO

Toxicity Characteristic Leaching Procedure TEQ Toxic Equivalency Quotient or Total Equivalence

QSM US Department of Defense Quality Systems Manual Version 6.0

US EPA United States Environmental Protection Agency

WA DWER Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50% Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 - 150%, VOC recoveries 50 - 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

- 1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
- 3. pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- 4. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte
- 5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data



Quality Control Results

	Test		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Arsenic			mg/L	< 0.001			0.001	Pass	
Cadmium			mg/L	< 0.0002			0.0002	Pass	
Chromium			mg/L	< 0.001			0.001	Pass	
Copper			mg/L	< 0.001			0.001	Pass	
Lead			mg/L	< 0.001			0.001	Pass	
Nickel			mg/L	< 0.001			0.001	Pass	
Zinc			mg/L	< 0.005			0.005	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	99			80-120	Pass	
Cadmium			%	91			80-120	Pass	
Chromium			%	93			80-120	Pass	
Copper			%	91			80-120	Pass	
Lead			%	92			80-120	Pass	
Nickel			%	92			80-120	Pass	
Zinc			%	89			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S24-Se0058666	NCP	%	102			75-125	Pass	
Cadmium	S24-Se0058666	NCP	%	93			75-125	Pass	
Chromium	S24-Se0058666	NCP	%	94			75-125	Pass	
Copper	S24-Se0058666	NCP	%	91			75-125	Pass	
Lead	S24-Se0058666	NCP	%	92			75-125	Pass	
Nickel	S24-Se0058666	NCP	%	91			75-125	Pass	
Zinc	S24-Se0058666	NCP	%	89			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Se0052877	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S24-Se0052877	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S24-Se0052877	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S24-Se0052877	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S24-Se0052877	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nickel	S24-Se0052877	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S24-Se0052877	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Se0052878	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S24-Se0052878	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S24-Se0052878	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S24-Se0052878	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S24-Se0052878	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nickel	S24-Se0052878	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S24-Se0052878	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	1



Comments

Sample Integrity

 Custody Seals Intact (if used)
 N/A

 Attempt to Chill was evident
 Yes

 Sample correctly preserved
 Yes

 Appropriate sample containers have been used
 Yes

 Sample containers for volatile analysis received with minimal headspace
 Yes

 Samples received within HoldingTime
 Yes

 Some samples have been subcontracted
 No

Authorised by:

Andrew Black Analytical Services Manager
Mickael Ros Senior Analyst-Metal

Glenn Jackson Managing Director

Final Report - this report replaces any previously issued Report

- Indicates Not Requested
- * Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Ramboli 0481 384 112 Page 1 of 7 Sam Buckley 3/100 Pacific Highway, North Sydney 2060, NSW Alitayeta Metals(As, Cr, Cu, Pb, Ni, Zn, Cd) 318001968 318001968 07 3902 4600 EnviroSampleQLD@eurofins.com EQUIS Stephen Maxwell 500mL Plastic

CHAIN OF CUSTODY RECORD Eurofins | Environment Testing ABN 50 005 085 521 Sydney Laboratory
Unit F3 BM.F 16 Mans Road Lane Cove West NSW 2068 02 9900 8400 EnviroSampleNSW@eurofins.com Brisbane Laboratory
Unit 121 Smallwood Place Murarrie QLD 4172 Derth Laboratory
Unit 2 9's Leach Highway Kewdale WA 6195
08 9251 9800 EnviroSampleWA@eurolins.com Sam Buckfey Sam Buckley auld@ramboll.com; smaxwell@ramboll.com iauld@ramboll.com; asiapac-accounts@ramboll.com ☐ Melbourne Laboratory 03 8584 5000 EnviroSampleVic@eurofins.com 6 Monterey Road Dandenong South VIC 3175

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Eurofins Environment Testing Australia Pty Ltd

Laboratory Use Only

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Environmental Division Sydney
Work Order Reference
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500mL PFAS Bottle

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☐ 1 day• ☐ 3 days 💀 ·

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CHAIN OF CUSTODY RECORD Eurolins | Environment Testing ABN 50 005 085 521

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Melbourne Laboratory
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03 8554 5000 EnviroSampleVic@eurofins.com

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			Name Sam Buckley	Signature		Date 9/19/2024	124 Time

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98 9261 9690 EnviroSampleWA@eurofins.com

Melbourne Laboratory

5 Monierey Road Danderong South VIC 3175

03 8564 5000 EnviroSampleVio@eurofins.com

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Perth Laboratory
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Melbourne Laboratory

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Laboratory Use Only -R02_20240918 R01_20240917 T01_20240917 D03_20240917 D02_20240917 D01_20240917 T03_20240917 T02_20240917 Ramboll 3/100 Pacific Highway, North Sydney 2060, NSW Page 7 of 7 0481 384 112 Sam Buckiey TP6_3.0 Courier (# Received By Received By 18/09/24 17/08/24 18/08/24 17/08/24 17/08/24 17/08/24 17/08/24 17/08/24 18/08/24 Total Count [3] Hand Delivered S co co (A) Ś ø S s ç 02 9900 8400 EnviroSempleNSW@eurofins.com SYD | BNE | WELL PER I ADL! NT | DRW 9 Metals(As, Cr, Cu, Pb, Ni, Zn, Cd) SYD | BNE | WEL | PER | ADL | NIT | DRW X × × × × × × × X 318001968 318001968 Postal Name Signature Sam Buckley EQuis Stephen Maxwell Signature Date Date 08 9251 9600 EnviroSampleWA@eurofins.com 500mL Plastic 250mL Plastic Tine Time Date 125mL Plastic 200mL Amber Glass 40mL VOA viai Sam Buckley Sam Buckley iauld@ramboll.com; smaxwell@ramboll.com auld@ramboll.com; asiapac-accounts@ramboll.com 500mL PFAS Bottle _ • _ Jar (Glass or HDPE) ø ---Asbetos Bag ☐ 2 days • 园 5 days (Standard) Overnight (reporting by 9am) • Pb Conc Approx < 5000mg/kg Other(emperature. Pb Conc Approx < 5000mg/kg Please forward to ALS Pb Conc Approx < 5000mg/kg Please forward to ALS Pb Conc Approx < 5000mg/kg Approx < 5000mg/kg Please forward to ALS Pb Conc Same day 🌣 Time ☐ 3 days 🏶 ☐ 1 day# +Surcharge will apply

CHAIN OF CUSTODY RECORD

Europhus [Environment Teating ARN 50 005 005 52]

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Perth Laboratory
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Melbourne Laboratory

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SAMPLE RECEIPT NOTIFICATION (SRN)

: ES2431034 Work Order

Client : RAMBOLL AUSTRALIA PTY LTD Laboratory : Environmental Division Sydney

Contact : MR STEPHEN MAXWELL Contact : Customer Services ES

Address : PO BOX 560 Address : 277-289 Woodpark Road Smithfield NORTH SYDNEY NSW, AUSTRALIA

NSW Australia 2164

: smaxwell@ramboll.com

F-mail : ALSEnviro.Sydney@ALSGlobal.com

Telephone Telephone : +61 2 8784 8555 Facsimile **Facsimile** : +61-2-8784 8500

Project : 318001968 Page · 1 of 2

Order number Quote number : EB2017ENVIAUS0001 (EN/222) C-O-C number QC Level : NEPM 2013 B3 & ALS QC Standard Site

Sampler Sam Buckley

Dates

E-mail

Date Samples Received : 20-Sep-2024 13:30 Issue Date : 23-Sep-2024 : 27-Sep-2024 Scheduled Reporting Date Client Requested Due 27-Sep-2024

Date

Delivery Details

Mode of Delivery Security Seal Carrier : Not Available

No of coolers/hoxes Temperature : 12.3, 11.5, 11.8'C - Ice

Bricks present

Receipt Detail No. of samples received / analysed : 3/3

General Comments

This report contains the following information:

- Sample Container(s)/Preservation Non-Compliances
- Summary of Sample(s) and Requested Analysis
- Proactive Holding Time Report
- Requested Deliverables
- Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no 10911
- Sample Disposal Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

: 23-Sep-2024 Issue Date

Page

2 of 2 ES2431034 Amendment 0 Work Order

Client : RAMBOLL AUSTRALIA PTY LTD



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

• No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package. If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the Digestion) laboratory and displayed in brackets without a time component SOIL - EA055-103 **Joisture Content** OIL - S-01 Metals (incl. [Matrix: SOIL Laboratory sample Sampling date / Sample ID time ES2431034-001 17-Sep-2024 00:00 T01_20240917 ES2431034-002 17-Sep-2024 00:00 T02 20240917 ES2431034-003 18-Sep-2024 00:00 T03 20240917

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	AsiaPac-Accounts@Ramboll.com
JENNY AULD		
 *AU Certificate of Analysis - NATA (COA) 	Email	jauld@ramboll.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	jauld@ramboll.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	jauld@ramboll.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	jauld@ramboll.com
- A4 - AU Tax Invoice (INV)	Email	jauld@ramboll.com
- Chain of Custody (CoC) (COC)	Email	jauld@ramboll.com
 EDI Format - EQUIS_RAMBOLL_APAC (EQUIS_RAMBOLL_APAC) 	Email	jauld@ramboll.com
- EDI Format - XTab (XTAB)	Email	jauld@ramboll.com
STEPHEN MAXWELL		
 *AU Certificate of Analysis - NATA (COA) 	Email	smaxwell@ramboll.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	smaxwell@ramboll.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	smaxwell@ramboll.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	smaxwell@ramboll.com
- Chain of Custody (CoC) (COC)	Email	smaxwell@ramboll.com
 EDI Format - EQUIS_RAMBOLL_APAC (EQUIS_RAMBOLL_APAC) 	Email	smaxwell@ramboll.com
- EDI Format - XTab (XTAB)	Email	smaxwell@ramboll.com



CERTIFICATE OF ANALYSIS

Work Order : ES2431034

Client : RAMBOLL AUSTRALIA PTY LTD

Contact : MR STEPHEN MAXWELL

Address : PO BOX 560

NORTH SYDNEY NSW, AUSTRALIA 2060

Telephone : ---

Project : 318001968

Order number : ---C-O-C number : ----

Sampler : Sam Buckley

Site : ---

Quote number : EN/222

No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 2

Laboratory : Environmental Division Sydney

Contact : Customer Services ES

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 2 8784 8555

Date Samples Received : 20-Sep-2024 13:30

Date Analysis Commenced : 26-Sep-2024

Issue Date : 27-Sep-2024 17:59



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories Position Accreditation Category

Ankit Joshi Senior Chemist - Inorganics Sydney Inorganics, Smithfield, NSW Edwardy Fadjar Organic Coordinator Sydney Inorganics, Smithfield, NSW

Page : 2 of 2 Work Order : ES2431034

Client : RAMBOLL AUSTRALIA PTY LTD

Project : 318001968

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key: CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

- ^ = This result is computed from individual analyte detections at or above the level of reporting
- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	T01_20240917	T02_20240917	T03_20240917		
		Samplii	ng date / time	17-Sep-2024 00:00	17-Sep-2024 00:00	18-Sep-2024 00:00		
Compound	CAS Number	LOR	Unit	ES2431034-001	ES2431034-002	ES2431034-003		
				Result	Result	Result		
EA055: Moisture Content (Dried @ 105	-110°C)							
Moisture Content		1.0	%	2.4	11.3	21.6		
EG005(ED093)T: Total Metals by ICP-A	ES							
Arsenic	7440-38-2	5	mg/kg	22	8	80		
Cadmium	7440-43-9	1	mg/kg	5	<1	36		
Chromium	7440-47-3	2	mg/kg	27	17	74		
Copper	7440-50-8	5	mg/kg	247	67	612		
Lead	7439-92-1	5	mg/kg	835	147	4490		
Nickel	7440-02-0	2	mg/kg	12	6	51		
Zinc	7440-66-6	5	mg/kg	1620	755	13900		





QUALITY CONTROL REPORT

: 1 of 3

Accreditation No. 825

Accredited for compliance with ISO/IEC 17025 - Testing

Work Order : ES2431034 Page

Client : RAMBOLL AUSTRALIA PTY LTD Laboratory : Environmental Division Sydney

Contact : MR STEPHEN MAXWELL Contact : Customer Services ES

Address : PO BOX 560 Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

NORTH SYDNEY NSW, AUSTRALIA 2060

Telephone

 Telephone
 : --- Telephone
 : +61 2 8784 8555

 Project
 : 318001968
 Date Samples Received
 : 20-Sep-2024

Order number : ---- Date Analysis Commenced : 26-Sep-2024

C-O-C number : ---- Issue Date : 27-Sep-2024

Sampler : Sam Buckley

No. of samples analysed : 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall

This Quality Control Report contains the following information:

: EN/222

: 3

• Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits

Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits

Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

No. of samples received

not be reproduced, except in full.

Site
Quote number

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW

Page : 2 of 3 Work Order : ES2431034

Client : RAMBOLL AUSTRALIA PTY LTD

Project : 318001968

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key: Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

= Indicates failed QC

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit: Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: SOIL						Laboratory L	Ouplicate (DUP) Report		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Tot	al Metals by ICP-AES	(QC Lot: 6080744)							
ES2430886-065	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	3	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	7	18.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	10	10	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	9	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	47	38	21.9	No Limit
ES2430959-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
EA055: Moisture Co	ntent (Dried @ 105-110	°C) (QC Lot: 6080747)							
ES2431034-002	T02_20240917	EA055: Moisture Content		0.1 (1.0)*	%	11.3	9.6	15.9	0% - 50%

Page : 3 of 3 Work Order : ES2431034

Client : RAMBOLL AUSTRALIA PTY LTD

Project : 318001968



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EG005(ED093)T: Total Metals by ICP-AES (QCLo	t: 6080744)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	98.5	88.0	113	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	80.6	70.0	130	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	107	68.0	132	
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	103	89.0	111	
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	92.7	82.0	119	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	95.4	80.0	120	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	88.6	66.0	133	

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Ma	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable I	Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
EG005(ED093)T: To	otal Metals by ICP-AES (QCLot: 6080744)							
ES2430886-065	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70.0	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70.0	130	
		EG005T: Chromium	7440-47-3	50 mg/kg	105	68.0	132	
		EG005T: Copper	7440-50-8	250 mg/kg	102	70.0	130	
		EG005T: Lead	7439-92-1	250 mg/kg	105	70.0	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	105	70.0	130	
		EG005T: Zinc	7440-66-6	250 mg/kg	105	66.0	133	



QA/QC Compliance Assessment to assist with Quality Review

Work Order : **ES2431034** Page : 1 of 4

Client : RAMBOLL AUSTRALIA PTY LTD Laboratory : Environmental Division Sydney

 Contact
 : MR STEPHEN MAXWELL
 Telephone
 : +61 2 8784 8555

 Project
 : 318001968
 Date Samples Received
 : 20-Sep-2024

 Site
 :-- Issue Date
 : 27-Sep-2024

Sampler : Sam Buckley No. of samples received : 3
Order number : ---- No. of samples analysed : 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers: Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.

Outliers: Analysis Holding Time Compliance

NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

Quality Control Sample Frequency Outliers exist - please see following pages for full details.

Page : 2 of 4
Work Order : ES2431034

Client : RAMBOLL AUSTRALIA PTY LTD

Project : 318001968



Outliers: Frequency of Quality Control Samples

Matrix: SOIL

Quality Control Sample Type	Quality Control Sample Type				€ (%)	Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Moisture Content	EA055	1	14	7.14	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for <u>VOC in soils</u> vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive <u>or</u> Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: **x** = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) T01_20240917,	T02_20240917	17-Sep-2024				26-Sep-2024	01-Oct-2024	1
Soil Glass Jar - Unpreserved (EA055) T03_20240917		18-Sep-2024				26-Sep-2024	02-Oct-2024	1
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) T01_20240917,	T02_20240917	17-Sep-2024	26-Sep-2024	16-Mar-2025	✓	27-Sep-2024	16-Mar-2025	√
Soil Glass Jar - Unpreserved (EG005T) T03_20240917		18-Sep-2024	26-Sep-2024	17-Mar-2025	✓	27-Sep-2024	17-Mar-2025	✓

Page : 3 of 4
Work Order : ES2431034

Client : RAMBOLL AUSTRALIA PTY LTD

Project : 318001968



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: SOII

Evaluation: × = Quality Control frequency not within specification; ✓ = Quality Control frequency within specification.

		Evaluation. • - Quality Control frequency not within specification, • - Quality Control frequency within specific								
	Co	ount		Rate (%)		Quality Control Specification				
Method	QC	Reaular	Actual	Expected	Evaluation					
EA055	1	14	7.14	10.00	3c	NEPM 2013 B3 & ALS QC Standard				
EG005T	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard				
EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
	EA055 EG005T EG005T	Method QC EA055 1 EG005T 2 EG005T 1 EG005T 1	EA055 1 14 EG005T 2 14 EG005T 1 14 EG005T 1 14	Count Method QC Reaular Actual EA055 1 14 7.14 EG005T 2 14 14.29 EG005T 1 14 7.14 EG005T 1 14 7.14	Count Rate (%) Method QC Reaular Actual Expected EA055 1 14 7.14 10.00 EG005T 2 14 14.29 10.00 EG005T 1 14 7.14 5.00 EG005T 1 14 7.14 5.00	Count Rate (%) Method QC Regular Actual Expected Evaluation EA055 1 14 7.14 10.00 ★ EG005T 2 14 14.29 10.00 ✓ EG005T 1 14 7.14 5.00 ✓ EG005T 1 14 7.14 5.00 ✓				

Page : 4 of 4 Work Order : ES2431034

Client : RAMBOLL AUSTRALIA PTY LTD

Project : 318001968

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).



Ramboll

Appendix 6
Borehole Logs



		Bo	re Hole/	Test	Pit Lo	gging Shee	t			
						Sample ID:	HA1			
Project N	ame: c	aptains	Flat Detailed Rem	ediation Ra	amboll Per	rsonnel Sam Buckle	y, Brodie Wo			
Project N		00196								
	7/09/20									
Start tim		O AM			Subcontractors: n/a					
Finish tim Drill	ne: 4:3	0pm		Lo	cation:	Captains Flat,	NSW			
Method	Depth	PID	Sample	Descrip	tion		Well			
Hand Auger			1 1 1	230.76			110			
	0.0 - 0.	1	HA1_0.0	FILL: Gra	velly SAND,	fine, orange/brown, roo	otles, dry.			
						_== = - _ - _ -				
	\bot									
	0.1	_	1101 0 5	EU L						
	0.1 - 0.		HA1_0.5	FILL: Gra	velly CLAY,	orange, fine, angular gr	avei, moist.			
				EOI at 0.	Embal					
				EOI at 0.	ambgi					
	-									
	+++									
		++								
Water				Graphic	: Loa	Fauinme	nt Serial No.			
	∇	Star	nding Water Lev			293.511101				
	T Y				Split Spoo	n				
		See	page		disturbed					
	Seepage				ish Tuhe					



		Во	re Hole/	Tes	t Pit Log	gging Shee	t
						Sample ID:	HA2
Project Na	me: Ca	ptains	Flat Detailed Remed	diation	Ramboll Pers	sonnel Sam Buckley	, Brodie Wood
Project No	o: 3180	00196	8				
	7/09/20						
Start time					Subcontracto		
Finish tim				Б	Location:	Captains Flat, N	
Drill	Depth	PID	Sample	Desc	ription		Well
Hand Auger	0.0.01		НАЗ ОО	F11.1	Constally CANE	6:no one all our resistant a	ala anang:
	0.0 - 0.1		HA2_0.0		ets, dry.	fine, small angular grave	eis, orange,
				1000	cts, dry.		
				++-	1	++- -	
	0.1 - 0.3			FILL:	SANDY CLAY, sof	t medium plasticity, ora	nge, moist.
		1		† † †	T — — — T T .		
	0.3 - 0.5		HA2_0.5	NATU	RAL: CLAY, soft	medium plasticity, pale	grey, wet.
				EC	I at 0.5mbgl		
	-						
Water				Gran	hic Log	Fauinmen	t Serial No.
	∇	Stan	ding Water Leve			Equipmen	30.10.140.
	- ' -		1 1 1 1 1 1 1		= Split Spoor		
		Seep	page		Undisturbed		
		2001	~g~	J _	2.13.313.60		



			Во	re H	ole/1	e	st	Pi	t Le	og	gir	ıg S	She	et		
											Si	ampl	e ID:		НАЗ	
Project Na	ime:	Car	ptains	Flat Detail	led Remedi	atio	n l	Ramk	oll P	ersc	nnel	Sam	Buck	dey, Br	odie Wo	oc
Project No			0196													
	7/09/	/202	:4													
Start time	e: 8	3:30	AM					Subc	ontra	ctor	´S:	n/a				
Finish tim	e: 4	: 30	pm				I	₋ocat	ion:		Ca	aptair	ıs Fla	t, NSW		
Drill	Dep	th	PID	Sample		De	scr	iptior	1						Well	
Hand Auger																
	0.0 -	0.1		HA3_0.	0	FILI	L: G	ravelly	/ SAN	D, fir	ne, ora	nge/b	rown,	rootles, (dry.	
										ТΤ			TT			
	0.1 -	0.5		HA3_0.	5	FILI	L: G	ravelly	CLA	/, ora	ange,	fine, a	ngular	gravel, i	moist.	
							П									
							EOI	at 0.5	mbgl							
		-														
						\vdash										
		+				\vdash										
		-				\dashv										
		-														
												_		1 1		_
Water		, ,						ic Lo				Ε¢	quipm	nent Se	rial No.	
			Stan	ding Wa	ter Level											
								Spli								
			Seep	age		U =	= U	ndist	urbe	d						
						РΤ	= 1	Push	Tube	4						



		Во	re Hole/	Tes	t Pit Log	gging S	heet	
						Sample	e ID:	HA4
Project Na	ime:	Captains	Flat Detailed Reme	ediation	Ramboll Pers	sonnel Sam	Buckley, Bro	die Wood
Project No		800196						
Date: 1	7/09/2	024						
Start time		30 AM			Subcontracto			
Finish tim	_	30pm		-	Location:	Captain	s Flat, NSW	147 11
Drill	Deptl	n PID	Sample	Desc	cription			Well
Hand Auger	0.0 - 0	0.1	HA4_0.0	FILL:	Gravelly SAND,	fine, orange/br	own, rootles, di	r <u>y</u> .
	0.1 - 0	0.5	HA4_0.5	FILL	Gravelly CLAY, o	orange, fine, an	agular gravel, m	noist.
					S. a. only out 17, 0	ango, mo, di	.galar graver, III	1
				EC	OI at 0.5mbgl			
		-						
Water				ohic Log	Eq	uipment Ser	ial No.	
	$\Box \nabla$	Stan	nding Water Lev					
					= Split Spoor	1		
		Seep	page	U =	Undisturbed			
		\neg		PT =	Push Tube			



		Во	re Hole/	Tes	t Pit Log	gging Shee	t
						Sample ID:	HA5
Project Na	ame: Ca	aptains	Flat Detailed Reme	diation	Ramboll Pers	sonnel Sam Buckley	, Brodie Wood
Project No		00196					
	7/09/20						
Start time) AM			Subcontracto		1014
Finish time	-		Camerala	Door	Location:	Captains Flat, N	
Drill	Depth	PID	Sample	Desc	cription		Well
Hand Auger	0.0 - 0.1		HA5_0.0	FILL:	Gravelly, SAND,	fine, brown, moist.	
	0.1 - 0.5		HA5_0.5	FILL:	CLAY, soft mediu	um plasticity, orange/pa	le grey moist.
		<u> </u>		+ = -		, , , , , , , , , , , , , , , , , , , ,	3 - 7 - 1 - 1 - 1
				EC	OI at 0.5mbgl		
		-					
		-					
		+					
Water			alia a Matau		phic Log	Equipmen	t Serial No.
	-	Stan	ding Water Leve				
		Seep	nage		Split SpoonUndisturbed	1	
	 <	Jeek	Jay c		Push Tube		



		Вс	ore Hole	/Tes	t Pit Log	gging Sheet	
						Sample ID:	HA6
Project Na	ime:	Captains	s Flat Detailed Rer	nediation	Ramboll Pers	sonnel Sam Buckley,	Brodie Wood
Project No		80019					
Date: 1	7/09/2	2024					
Start time		30 AM			Subcontracto		
Finish tim	_	_			Location:	Captains Flat, N	
Drill	Dept	h PID	Sample	Desc	ription		Well
Hand Auger		2.4	1107 0 0	E		c: u .	
	0.0 - 0	J. 1	HA6_0.0		e/brown, moist.	fine, small angular grave	IS,
				orang	e/brown, moist.		
			110 (2 =				
	0.1 - (0.5	HA6_0.5	FILL:	Gravelly CLAY, o	orange, fine, angular grav	el, moist.
				EC	I at 0.5mbgl		
Water				hic Log	Equipment	Serial No.	
	$\Box \nabla$	Star	nding Water Le				
					= Split Spoor	1	
		See	page	U =	Undisturbed		
		7		PT =	Push Tube		



			Во	re F	lole/7	Te:	st	Pi	t Lo	og	gir	ng S	She	et	
											S	ampl	e ID:		HA7
Project Na	me:	Ca	ptains	Flat Deta	ailed Remed	iatio	n I	Ramk	oll P	ersc	onne	Sam	Buck	dey, Bro	odie Woo
Project No			0196												
	7/09	/202	24												
Start time	e: 8	3:30	AM				,	Subc	ontra	ctor	´S:	n/a			
Finish tim	e: 4	1:30	pm				I	_ocat	ion:		C	aptair	าร Fla	t, NSW	
Drill	Dep	oth	PID	Samp	le	De	scr	iptior	1						Well
Hand Auger															
	0.0	- 0.1		HA7_0	0.0	FILI	L: G	ravelly	, SAN	ID, fi	ne, b	own, ı	moist.		
	ГΤ	\top		TTT			_		TT:	ТΤ			TΤ		
	0.1	- 0.5		HA7_0	0.5_	FILI	L: G	ravelly	/ CLAY	Y, me	dium	plastic	city, lig	ıht grey,	wet.
	\Box	\top		$\sqcap \top \top$						TT		\Box	77		
							EOI	at 0.5	mbgl						
		+													
		+													
		+													
		+													
		-													
		-													
Water	-	7						ic Lo				E	quipn	nent Sei	rial No.
		/	Stan	ding W	ater Leve										
								Spli							
			Seep	age		U =	= U	ndist	urbe	d					
		7				РΤ	=	Push	Tube	2					



			Во	re Hole	/Tes	st Pit Lo	gging	Sheet	t
							Sam	ple ID:	HA8
Project Na	ime:	Cai	otains	Flat Detailed Re	mediation	Ramboll Per	sonnel Sa	m Buckley	, Brodie Wood
Project No			0196						
	7/09/	/202	4						
Start time	: 8	3:30	AM			Subcontract	ors: n/a	а	
Finish tim	e: 4	: 30	om			Location:	Capta	ains Flat, N	SW
Drill	Dep	th	PID	Sample	Des	scription			Well
Hand Auger									
	0.0 -	0.1		HA8_0.0	FILL	:Gravelly SAND, f	fine, orange	brown, rootle	es, dry.
	0.1 -	0.5		HA8_0.5	FILL	: Gravelly CLAY, i	medium plas	ticity, black f	ine angular
					grav	els, moist.			
					1	OI at 0.5mbgl			
		-							
Water						phic Log		Equipment	Serial No.
			Stan	ding Water L	_				
						Γ = Split Spoor	n		
			Seep	age		Undisturbed			
					PT	= Push Tube			



		Во	re Hole/	Test	Pit Log	gging	Sheet	t
						Sam	nple ID:	HA9
Project Na	ame: Ca	ptains	Flat Detailed Remed	diation	Ramboll Pers	sonnel Sa	am Buckley	, Brodie Wood
Project No		00196						
Date: 1	7/09/202	24						
Start time	e: 8:30) AM			Subcontracto	ors: n/	'a	
Finish tim	e: 4:30	pm			Location:	Capt	ains Flat, N	ISW
Drill	Depth	PID	Sample	Desci	ription			Well
Hand Auger								
	0.0 - 0.1	<u> </u>	HA9_0.0	FILL: G	ravelly SAND, f	ine, black,	dry.	
	0.1 - 0.3	<u> </u>		FILL: S	andy Gravel, sn	nall angula	r, black, dry.	
	0.3 - 0.5	{ _ _	HA9_0.5	FILL: C	LAY, orange/bla	ick, mediur	n plasticity, so	oft, moist.
				EO	at 0.5mbgl			
	<u> </u>							
	<u> </u>							
Water					nic Log		Equipmen	t Serial No.
		Stan	ding Water Leve					
					Split Spoor	1		
		Seep	page	U = l	Indisturbed			
		1		PT =	Push Tube			



		Во	re Hole/	Test	Pit Log	gging	Shee	t
						Sam	ple ID:	HA10
Project Na	ame:	Captains	Flat Detailed Remed	diation	Ramboll Pers	sonnel Sa	m Buckley	, Brodie Wood
Project No		800196						
Date: 1	7/09/2	024						
Start time	e: 8:3	30 AM			Subcontract	ors: n/	а	
Finish tim					Location:	Capta	ains Flat, N	
Drill	Deptl	า PID	Sample	Descr	iption			Well
Hand Auger								
	0.0 - 0).1	HA10_0.0	FILL: G	avelly SAND, f	ine, orange	/brown, rootl	es, dry.
	0.1 - 0).5	HA10_0.5		ravelly CLAY, o T03_20240929		angular grav	vel, moist.
				EOI	at 0.5mbgl			
\\/ = \ = \				Cristil	1.1.2		Fauthers	t Carial Na
Water		Cta	ding Matar Law		nic Log		Equipmen	t Serial No.
	\vdash^{\vee}	Stan	ding Water Leve					
		Casi	2000		Split Spoor	1		
	 	\triangleleft	page		Indisturbed			
				PI =	Push Tube			



		Во	re F	Hole/1	Ге	st	P	it	Lc	ogg	giı	ng	S	he	et			
											S	Samp	ole	ID:		ŀ	lA11	
Project Na	ime: Ca	aptains	Flat Det	ailed Remed	iatio	n	Rar	nbol	l Pe	erso	nne	l Sar	m E	Buck	ley	Broo	die Wo	000
Project No		00196																
	7/09/20:											+ +						
Start time								con		ctors	_	n/a		Flor	- NI	CM		
Finish tim Drill	Depth	PID	Samp	ale.	De	_	ipti	atior on	1;		C	apta	1115	ria	L, IN	3 V V	Well	
Hand Auger	Берин	110	Jamp	,,,,	٥	,301	יטנו	J11									VVCII	
	0.0 - 0.1		HA11.	_0.0								own/d	oran	ge, s	mall			
						angular gravels, rootlets, dry												
						EO	l at 0).1mb	ogl -	Refu	usal	(targe	et d	epth	0.5	mbgl)		
24.1					-											0 .	1.	_
Water		Ston					nic l		4				Equ	ııpm	ent	Seri	al No.	
	\vdash	Stan	anding Water Level D =						on									
		Seep	page		SPT = Split Spoon U = Undisturbed													
	Scopage							h Tu										



		В	ore Hole	/Tes	t Pit Lo	gging Sh	eet
						Sample IE): HA12
Project Na	ame:	Captair	ns Flat Detailed Re	mediation	Ramboll Per	sonnel Sam Bud	ckley, Brodie Wood
Project No		180019					
Date: 1	7/09/	2024					
Start time	9: 8	:30 AM			Subcontract	ors: n/a	
Finish tim	_	_			Location:	Captains Fl	at, NSW
Drill	Dep	th PII	Sample	Desc	ription		Well
Hand Auger							
	0.0 -	0.1	HA12_0.0	FILL:	Sand, fine, oranç	ge dry.	
			11010 0 5	1			
	0.1 -	0.5	HA12_0.5	FILL: (Gravelly clay, or	ange/brown, moist.	
				EC	I at 0.5mbgl		
Water				Cran	hic Log	Equip	ment Serial No.
vvalel		7 5+4	anding Water L			Equip	ment Jenai Nu.
		310	anding vvaler L				
		90	epage		Split SpoorUndisturbed		
	\vdash	\prec	cpage				
				PI =	Push Tube		



			Во	re Hole	/Te	st	Pi	t L	og	gir	ng S	She	et	
										Sa	ampl	e ID:		HA13
Project Na	me:	Ca	ptains	Flat Detailed Rer	nediatio	n	Raml	ooll P	ersc	onnel	Sam	Buck	ley, Bro	odie Wood
Project No			0196											
Date: 17	7/09	/202	24											
Start time	:	8:30	AM					ontra	ctor	rs:	n/a			
Finish tim	_					_	Loca		Ш	Ca	ptain	s Fla	t, NSW	
Drill	De	pth	PID	Sample	De	scr	iptio	า						Well
Hand Auger	Ш													
	0.0	- 0.1		HA13_0.0	FILI	L:G	ravelly	SANE), fin	e, gre	y, dry.	↓	 	
						EOI	at 0.1	lmbgl	- Ret	fusal (target	depth	0.5 mbgl)
	H													
	\vdash													
		_												
		_												
		_												
	Н	_												
	Ш													
Water							nic Lo				Ec	quipm	nent Ser	ial No.
		\bigvee	Stan	ding Water Le		D = Disturbed								
						SPT = Split Spoon								
			Seep	page	U =	= L	Indis	turbe	d					
			4		РТ	=	Push	Tube	2					



		Во	re Hole	/Tes	t Pit Lo	gging Sh	eet	
						Sample I	D: I	HA14
Project Na	ime: c	aptains	Flat Detailed Rem	nediation	Ramboll Per	sonnel Sam Bu	ıckley, Bro	die Woo
Project No	o: 318	00196	8					
Date: 17	7/09/20)24						
Start time	e: 8:3	O AM			Subcontract	tors: n/a		
Finish time		_			Location:	Captains F	lat, NSW	
Drill	Depth	PID	Sample	Desc	cription			Well
Hand Auger								
	0.0 - 0.	1	HA14_0.0	FILL:	Gravelly SAND,	fine, orange/browr	n, dry.	
	+++			E	OI at 0.1mbgl - I	Refusal (target dep	oth 0.5 mbgl)	
		_						
		-						
		-						
	<u> </u>							
	<u> </u>							
	+++							
	\Box							
Water					ohic Log	Equi	oment Ser	ial No.
	\square	Stan	ding Water Le					
					= Split Spoo	n		
		Seep	oage		Undisturbed			
				PT =	Push Tube			



		Bo	re Hole/T	Test Pit Logg	ing Sheet					
					Sample ID:	ТР1				
Project N	ame: ca	intains Flat	t Detailed Remediation D	pesian						
Project N		001968		osign .						
	7/09/202		-							
Start tim				Subcontractors:	RCA Australia					
Finish tin	ne: 4:30) PM		Location:	Captains Flat, NSW					
Drill										
Method	Depth		Sample	Description		Well				
Excavator	0.0		TP1_0.0	FILL; Generally comp	-	L,				
		4 1		SAND and SILT, dark grey						
				medium to coarse and						
			TP1_0.5	grained sand, with so	·	rods,				
				steel wire, terracotta,	plastic) throughout.					
				Inclding ballast						
			TP1_1.0							
			TP1_1.5							
	2.2		TP1_2.0	Silty sandy CLAY, me	dium plasticity, orang	е				
				and pale grey mottlin	g, fine to coarse grair	ned				
				sand with fine to coar	se sub-angular grave	ls				
			TP1_2.5	throughout						
			TP1_3.0							
	3.5			SILTSTONE/SANDSTO	ONE, very fine grained	l, grey				
				to brown with iron ox	J 0					
	3.7									
				EOI @ 3.7mbgl						
				20. 0 0.711bgi						
	 	+								
	+									
Matar				Craphic Log	Equipment Coris	al No				
Water		Ctons	ding Water Level	Graphic Log	Equipment Seria	ai INO.				
		Stand	ding Water Level							
				SPT = Split Spoon						
	<	Seepa	age	U = Undisturbed						
		1		PT = Push Tube						



		Во	re Hole	/Tes	t Pit Lo	ggir	ng Shee	et
							ample ID:	TP2
						3	ample 10.	IFZ
Project N			at Detailed Remedia	tion Design				
Project N		00196	8					
Date: 1 Start time	7/09/20	24) AM			Subcontrac	tors	RCA Austra	dia
Finish tim					Location:		aptains Flat,	
Drill	Depth	_	Sample	Desc	cription		артаніз і іат,	Well
Excavator	0.0	ווט	TP2_0.0		: Generally c	nmnris	sing silty san	
-7.0a va (OI	3.0		1. 2_0.0		o coarse angula			-
					oarse sand, v			
	0.4		TP2_0.5		sandy CLAY			
	2				to coarse gra	•		-
								with siltstone/
			TP2_1.0		cobles and bou			
	1.1							city, pale grey
					-		•	nd with fine to co
	'		TP2_1.5	1.1.50				
	2.0		TP2_2.0	SILT	STONE/SAN	DSTON	E, very fine	grained, off white
					orange			
	,							
				EOI	@ 2 m bgl			
Water				Gran	hic Log	++	Fauinme	ent Serial No.
	∇	Stan	ding Water L				Lydipinic	33.141.140.
			any water L		= Split Spoo	n		
		Seep	page		Undisturbed			
		-	- g-	J -	S. Idistal DCU			



		Во	re Hole/	Test Pit Log	gging Sheet	
					Sample ID:	TP3
Project N	amo: c	antaina Fl	at Datailed Damediatio	z Daniera		
Project N		00196	at Detailed Remediatio	n Design		
_	7/09/20					
Start time		D AM		Subcontracto	ors: RCA Australia	
Finish tim				Location:	Captains Flat, NS	SW
Drill	Depth	PID	Sample	Description		Well
Excavator	0.0		TP3_0.0		BBLES/Boulders, pale	e grey-brown
					jular gravels and fine to c	
				grained sand with		
			TP3_0.5			
	1.2		TP3_1.0	' -	one COBBLES/BOULDERS	
				-	med plasticity, orang	
				to coarse angular	gravel with fine to co	oarse grained
			TP3_1.5	sand		
			TP3_2.0			
		-				
		+-	TP3_2.5		+	
				EOI @ 2.5 mbg	1	
		+-				
		+-				
		+-				
		+-				
		++-				
Water				Graphic Log	Equipment	Serial No.
	\bigvee	Stan	ding Water Lev	/el D = Disturbed		
	Seepage			SPT = Split Spoon		
			U = Undisturbed			
		7		PT = Push Tube		



		Во	re Hole	Test Pit Logg	ging Sheet	
					Sample ID:	TP4
					campic 12.	
Project N			at Detailed Remediat	on Design		
Project N Date: 1	7/09/20	00196	00			
Start time		0 AM		Subcontractors	s: RCA Australia	
Finish tim				Location:	Captains Flat, NSV	V
Drill	Depth		Sample	Description		Well
xcavator	0.0		TP4_0.0	FILL: Silty gravelly S	SAND, fine to coarse	grained,
				dark grey/brown, fine to		
	0.4			cobbles/lead ore fra	gments	
			TP4_0.5	FILL: siltstone cobbl	les/boulders within (ravelly silty
				CLAY, low to mediur		
				pale orange, mediur		gravels
			TP4_1.0	with fine to coarse g	grained sand	
			TD4 4 5			
			TP4_1.5			
	2.0		TP4_2.0			
	2.0		1P4_2.0			-
				FOL@ 2 mbgl		
	_			EOI @ 2 mbgl		
Water				Graphic Log	Equipment S	erial No.
	V	Stan	ding Water Le	vel D = Disturbed		
				SPT = Split Spoon		
		Seep	page	U = Undisturbed		
		7		PT = Push Tube		



		Во	re Hole	Test Pit Log	ging Sheet					
					Sample ID:	TP5				
Project Na	ame: c	aptains Fl	at Detailed Remediation	on Design						
Project No	o: 318	300196	8							
Date: 1	7/09/20)24								
Start time	e: 8:0	O AM		Subcontracto	rs: RCA Australia					
Finish tim	ne: 4:3	O PM		Location:	Captains Flat, NS	SW				
Drill	Depth	PID	Sample	Description		Well				
xcavator	0.0		TP5_0.0	FILL: silty gravelly	SAND, fine to coars	e grained, dar				
				greu and brown, fine to lead ore gravel	coarse angular gravels,	with some				
			TP5_0.5							
			TDF 1.0		DAVEL C					
	1.0	-	TP5_1.0		RAVEL, fine to coars					
					olack, fine to coarse	-				
			TDE 4 5	_	es. Ballast and lead	ore sand				
			TP5_1.5	throughout						
	1.8	_	TDE 2.0		CLAY, low plasicity,					
	<u> </u>	-	TP5_2.0		gravels with siltstone					
		_		copples with some	lead ore throughout					
		_	TP5_2.5							
		+	125_2.5							
	2.8	_								
	2.8	_								
		_								
	-	-		FOL @ 2.0 ml	1					
	-	-		EOI @ 2.8 ml	ogi					
		_								
	-	-								
	+++									
	+++									
	-									
	++++									
	++++									
	+++									
	++++									
01-1				Constitution	E	Carial N.				
Water		lo:	aller a NAC i	Graphic Log Equipment Serial No.						
	\perp	Stan	laing Water Le	vel D = Disturbed						
				SPT = Split Spoon						
	_ _<	Seep	oage	U = Undisturbed						
		1		PT = Push Tube						



		Во	re Hole	/Test Pit	Logging S	Sheet			
					Sample	e ID: TP6			
Project N	ame: c	aptains Fl	lat Detailed Remedia	ation Design					
Project N		300196	8						
	7/09/20								
Start tim		O AM				Australia			
Finish tin	_			Locatio	n: Captain	s Flat, NSW			
Drill -	Depth	PID	Sample	Description	- LI CAND Can	Well			
Excavator	0.0		TP6_0.0			e tocoarse grained,			
	+++				n, fine to coarse angi ders including ba	ular gravels with some			
			TP6_0.5	CODDIES/DOU		mast			
	0.6		5_5.5	FILL: silty ar	avelly CLAY low	to med plasticity,			
	0.0				•	ngular gravels with			
	<u> </u>		TP6_1.0		d and ballast	ngalai gravois with			
			1 _ 1 . 0	1 1 1 1 1					
			TP6_1.5						
			TP6_2.0						
			TD (
	<u> </u>		TP6_2.5		┸┾┸┛╦┖┺				
	2.6			-	·	asticity, pale grey			
			TD4 2.0		_	e to coarse angular			
	3.0		TP6_3.0	siltstone gra	veis				
	+++								
	+++								
	+++				OI @ 3 mbgl				
	++++								
	+++								
	+++								
	++++								
Water				Graphic Log	Ec	quipment Serial No.			
		Stan	nding Water L	evel D = Disturbe					
				SPT = Split Spoon					
		Seep	oage	U = Undistu					
		1		PT = Push T	ube				



SHEET 1 OF 2

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE COMMENCED: 10/10/2024 DATE COMPLETED: 10/10/2024 SURFACE RL: 868.91 m AHD

COORDS: 720876.53 m E 6058770.97 m N MGA94 56 DRILL MODEL: Hanjin 8D, Track Mounted Drill Rig

-	LOCATION: Captains Flat Rail Corridor, Borehole Information						Copper Creek DRILL MODEL: Hanjin 8D, Track Mounted Drill Rig Field Material Information					
\vdash		Borehole In	formatic				Z	Field Material Infor	mation ເນ	-		
METHOD	WATER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, particle shape, colour, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)		CONSISTENCY/ RELATIVE DENSITY/ STRENGTH		
DOT, ENCA, STANDARD OLD TOO TOO TOO TOO TOO TOO TOO TOO TOO TO	Not Encountered	1.50m SPT 4, 5, 6 N=11 1.95m 3.00m PP90 - 160kPa SPT 2, 2, 3 N=5	0.50m D 0.95m 1.50m 1.50m 3.45m 3.45m	367.5 — - - - - - - - - - - - - - - - - - - -	-0.5 -1.0 -1.5 -1.5 -2.0 -3.0		GM CL-CI	FILL; Generally comprising a mixture of GRAVEL, SAND and SILT, dark grey-black, fine to coarse angular gravels (lead ore?), medium to coarse grained sand From approximately 0.75 to 0.95m; layer of Silty Gravelly CLAY, low to medium plasticity, orange-brown and orange, fine to coarse angular gravels From approximately 1.2m; becoming with some cobbles, angular, grey and pale grey, including siltstone and lead ore fragments FILL; Silty CLAY, low to medium plasticity, orange and dark orange-brown, mottled pale brown with some black speckles at intermittent intervals, with fine to coarse grained sand and fine to coarse grained sand and fine to coarse grained sand and fine to coarse sub-angular to angular gravels throughout	W~PL M		EMBANKMENT FILL	
	LOGGED: CD					T	CH	ECKED: MA	DA	TE: 22/1	10/2024	



SHEET 2 OF 2

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE COMMENCED: 10/10/2024 DATE COMPLETED: 10/10/2024 SURFACE RL: 868.91 m AHD

COORDS: 720876.53 m E 6058770.97 m N MGA94 56 DRILL MODEL: Hanjin 8D, Track Mounted Drill Rig

	Borehole Information						Field Material Information					
		Borenole in	itormati							-		
METHOD	WATER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME;plasticity/grain size, particle shape, colour, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS	
		4.50m -PP90kPa SPT 2, 2, 3 N=5 4.95m	4.50m D 4.95m	864.5 -			CL- CI	FILL; Silty CLAY, low to medium plasticity, orange and dark orange-brown, mottled pale brown with some black speckles at intermittent intervals, with fine to coarse grained sand and fine to coarse sub-angular to angular gravels throughout FILL; Silty CLAY, low to medium plasticity, orange and dark orange-brown, mottled pale brown with some black speckles at intermittent intervals, with fine to	w~PL		EMBANKMENT FILL	
AD/T	Not Encountered			863.5 -	 5.50i -			coarse grained sand and fine to coarse sub-angular to angular gravels throughout FILL: Generally comprising siltstone rock fragments, considered representative of COBBLE, angular, pale grey and grey-brown	M		Drillers noted increased drilling resistance from 5.5m	
		6.00m	6.00m	863.0 -	-6.0							
		SPT 8, 8, 13 N=21 6.45m	6.45m	862.5	-6.5			From approximately 6.25-6.35m; band of Silty Sandy GRAVEL, fine to medium angular gravel, dark brown, medium to coarse grained sand From approximately 6.35m; crushed crystalline (quartz slag?) material encountered	M-W	_		
				-	6.60 -			SILTSTONE/SHALE, orange-brown and green-brown	MW	M - H	BEDROCK Vey hard grinding drilling from 6.6	
				862.0 - 861.5 - 861.0 -				BOREHOLE BH1 TERMINATED AT 6.80 m TC Bit refusal on rock				
L	LOGGED: CD						CH	ECKED: MA	DA	TE: 22/1	10/2024	



SHEET 1 OF 2

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE COMMENCED: 10/10/2024 DATE COMPLETED: 10/10/2024 SURFACE RL: 868.77 m AHD

COORDS: 720858.20 m E 6058793.52 m N MGA94 56 DRILL MODEL: Hanjin 8D, Track Mounted Drill Rig

LOCATION: Capta			rriaor,	Coppe						
Borehole	Informat	ion			Field Material Information					
METHOD WATER FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, particle shape, colour, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS	
0.50m PP250 - 450kPa	0.50m	868.5 -	-0.5		GM	FILL; Generally comprising a mixture of GRAVEL, SAND and SILT, dark grey-black, fine to coarse angular gravels (lead ore?), medium to coarse grained sand From approximately 0.65m to 0.85m; layer of Silty	M W~PL		EMBANKMENT FILL	
SPT 3, 4, 10 N=1 0.95m	1	868.0 -	-1.0			Gravelly CLAY, low to medium plasticity, orange-brown and orange, fine to coarse angular gravels From approximately 0.85m; becoming with some cobbles, angular, grey and pale grey, including siltstone and lead ore fragments	M		-	
		867.5	- - - - - -			-				
1.50m SPT 3, 4, 5 N=9	1.50m	867.0 -							-	
Not Encountered	1.95m	- - - -	-2.0						-	
1.50m SPT 3, 4, 5 N=9 1.95m 3.00m SPT 8, 7, 6 N=13 3.45m		866.5 -	-2.5						-	
3.00m	3.00m	866.0 -	-3.0			At approximately 2.8m; becoming brown and pale orange-brown			-	
SPT 8, 7, 6 N=13		865.5	3.25 -		CL- CI	FILL; Silty Gravelly CLAY, low to medium plasticity. orange-brown and dark orange, fine to coarse angular gravels, with some to a trace of fine grained sand, with	w~PL			
3.45m	3.45m	865.0 -	-3.5			gravels, with some to a trace of fine grained sand, with some siltstone cobbles throughout				
LOGGED: CD	LOGGED: CD				D: CD CHECKED: MA			DAT	E: 22/1	0/2024



SHEET 2 OF 2

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE COMMENCED: 10/10/2024 DATE COMPLETED: 10/10/2024 SURFACE RL: 868.77 m AHD

COORDS: 720858.20 m E 6058793.52 m N MGA94 56 DRILL MODEL: Hanjin 8D, Track Mounted Drill Rig

	LOCATION: Captains Flat Rail Corridor, Co Borehole Information					Coppe							
		Borehole In	formati	on			- I	Field Material Inform	nation				
METHOD	WATER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, particle shape, colour, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS		
AD/T	Not Encountered	4.50m SPT 8, 5, 10 N=15 4.95m	4.50m D 4.95m	864.5 -	-4.5		CL- Cl	FILL; Silty Gravelly CLAY, low to medium plasticity. orange-brown and dark orange, fine to coarse angular gravels, with some to a trace of fine grained sand, with some siltstone cobbles throughout From approximately 4.7m to 4.8m; band of crushed rock recovered in SPT tube From approximately 4.9m to 4.95m; band of crushed rock recovered in SPT tube SILTSTONE/SHALE, pale orange-brown	W~PL D W>PL D MW	M - H	EMBANKMENT FILL		
INCLERED INTO THE TOTAL TO THE TOTAL TOTAL TOTAL TOTAL TOTAL THE TOTAL				863.0	-5.55 			BOREHOLE BH2 TERMINATED AT 5.40 m TC Bit refusal on rock					
	LOGGED: CD					CHECKED: MA			DAT	E: 22/1	10/2024		



SHEET 1 OF 2

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor. Copper Creek

DATE COMMENCED: 10/10/2024 DATE COMPLETED: 10/10/2024 SURFACE RL: 868.70 m AHD

COORDS: 720855.63 m E 6058795.83 m N MGA94 56 DRILL MODEL: Haniin 8D. Track Mounted Drill Rig

LLC	LOCATION: Captains Flat Rail Corrid Borehole Information						r Cre	eek DRILL MODEL: Ha	anjin 8D	, Track I	Mounted Drill Rig
		Borehole In	formatio	n			I	Field Material Infor			
МЕТНОD	WATER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME;plasticity/grain size, particle shape, colour, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
			8	- 368.5 — - -	-		GM	FILL; Generally comprising a mixture of GRAVEL, SAND and SILT, dark grey-black, fine to coarse angular gravels (lead ore?), medium to coarse grained sand	М		EMBANKMENT FILL Note: BH3 not logged to 5.3m depth, considered similar profile to adjacent BH2
			8	- - 868.0 — -	-0.5 - -			From approximately 0.65m to 0.85m; layer of Silty Gravelly CLAY, low to medium plasticity, orange-brown and orange, fine to coarse angular	w~PL	_	-
			8	- - - 867.5 —	- 1.0 -			gravels From approximately 0.85m; becoming with some cobbles, angular, grey and pale grey, including siltstone and lead ore fragments	М		-
sveloped by Datgel				-	- - 1.5 -						
30/10/2024 11:33 Produced by gin1 Professional, Developed by Darget AD/T	Not Encountered		3	867.0 — 	- - - -2.0						
			3	866.5 — - -	- - - -2.5						
			8	866.0 — - -	- - - -3.0			At approximately 2.8m; becoming brown and pale orange-brown			
			8	865.5 — - -	- 3.25 - -		CL- CI	FILL; Silty Gravelly CLAY, low to medium plasticity. orange-brown and dark orange, fine to coarse angular gravels, with some to a trace of fine grained sand, with some siltstone cobbles throughout	w~PL	_	
			8	- 865.0 — - -	-3.5 - - -						
LOGGED: CD							CH	HECKED: MA	DA	TE: 22/	10/2024



SHEET 2 OF 2

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE COMMENCED: 10/10/2024 DATE COMPLETED: 10/10/2024 SURFACE RL: 868.70 m AHD

COORDS: 720855.63 m E 6058795.83 m N MGA94 56 DRILL MODEL: Hanjin 8D, Track Mounted Drill Rig

LOCA	ATION: Captair	s Flat R	Rail Co	rridor,							
	Borehole In	formatic	on				Field Material Infor				
METHOD	FIELD	SAMPLE	RL (m AHD)	DЕРТН (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, particle shape, colour, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS	
		1	864.5 — - -	- - - -4.5		CL- CI	FILL; Silty Gravelly CLAY, low to medium plasticity. orange-brown and dark orange, fine to coarse angular gravels, with some to a trace of fine grained sand, with some siltstone cobbles throughout	w~PL		EMBANKMENT FILL	
		;	864.0 — - -	5.0							
AD/T		;	863.5 —	- 5.30 -				2004		PEDDOCK	
LOO	6.05m	;	- - 	-5.5			SILTSTONE/SHALE, orange-brown and green-brown	XW - HW	VL - L	BEDROCK Drillers noted slightly increased drilling resisteance from 5.3m	
	6.11m SPT 15/60mm N=R		- 862.5 - - - -				At approximately 6.1m; becoming moderately weathered and medium to high strength	MW	M - H	_	
		;	862.0 — - - - - 861.5 — - - - 861.0 —	-7.0			BOREHOLE BH3 TERMINATED AT 6.55 m TC Bit refusal on rock			-	
LO	LOGGED: CD					CH	IECKED: MA	DA	TE: 22/1	0/2024	



SHEET 1 OF 1

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE: 17/10/2024

SURFACE RL: 867.34 m AHD

COORDS: 720880.90 m E 6058781.95 m N MGA94 56 EXCAVATION METHOD: 14t excavator, 600mm bucket

LC	LOCATION: Captains Flat Rail Corridor, Test Pit Information						Copper Creek EXCAVATION METHOD: 14t excavator, 600mm bucket Field Material Information						
	_	Test Pit In	formation	1			- I	Field Material Inform	mation				
WATER	DYNAMIC PENETROMETER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS		
rouced by gin i Protessina, beveloped by Danger Not Encountered			8 8 2.20m	366.5	-0.5 -1.0 -1.5 -2.0		GM	FILL; Generally comprising Lead Ore/GRAVEL, SAND and SILT, dark grey and dark brown-grey, medium to coarse angular gravel, fine to coarse grained sand, with some rubbish (ie. steel rods, steel wire, terracotta pieces, plastic, etc.) throughout	D M		EMBANKMENT FILL/RESIDUAL?		
NOW_IND_OO_INOW_STANDARDGED_ LOG NOATESTETT LOG TOOTGEGOGGGG S-Gramiligmes** SUTUZOZA 11.30 Froduceu by givin Tronssorial; perenopeu by Dauge		PP80 - 100kPa PP90 - 120kPa	Z.40m (D 2.4-2.5m 2x8 2.60m 2.70m D 2.80m	365.0	-2.5 -3.0 -3.50 -		Ci	grey mottled red-orange, fine to coarse grained sand, with fine to coarse sub-angular to sub-rounded gravels throughout SILTSTONE/SANDSTONE, very fine grained, grey-brown with iron oxide staining TEST PIT TP1 TERMINATED AT 3.70 m	MW	М-Н	- - - - - - - - -		
	863.5 -							Limit of investigation			_		
L	LOGGED: CD						CH	ECKED: MA	DA	ΓE: 22/1	10/2024		



SHEET 1 OF 1

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor. Copper Creek

DATE: 17/10/2024

SURFACE RL: 866.24 m AHD

COORDS: 720871.88 m E 6058748.53 m N MGA94 56 EXCAVATION METHOD: 14t excavator, 600mm bucket

LO	CATIC	ns Flat R	tail Co	rridor,	r, Copper Creek EXCAVATION METHOD: 14t excavator, 600mm bucker						
		Test Pit Inf	ormation	n			19	Field Material Infor			
WATER	DYNAMIC PENETROMETER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATION
				- 866.0 — - -	- 0.40 - - 0.5		GM	FILL; Generally comprising Silty Sandy GRAVEL, fine to coarse angular lead ore gravel, dark grey, fine to coarse sand, with cobbles (up to 100mm size) Silty Sandy CLAY, low plasticity, orange-brown, fine to coarse grained sand, with fine to coarse angular gravels (siltstone rock fragments), abundant with siltstone/shale cobbles and boulders (up to approximately 300mm size)	M w>PL		FILL Trace of rubbish (ie. steel, etc.) COLLUVIUM / FILL?
Not Encountered				65.5 -	-1.0 -1.10 -		CL- CI	Silty Sandy CLAY, low to medium plasticity, pale grey mottled orange, fine to medium sand, with fine to		F	RESIDUAL
		-PP80kPa -PP>600kPa	1.30m (D 1.3-1.4m (U50 1.3-1.5m (2xB 1.4-1.6m (1.60m	<u> </u>	- - - -1.5			coarse sub-angular to angular siltstone rock fragments and siltstone/sandstone cobbles (up to approximately 150mm size)		St	
			8	864.5 — - -	- - 1.90 - 2.00-			SILTSTONE/SANDSTONE, very fine grained, off white and orange-brown, recovered as COBBLE, up to approximately 200mm size	MW	M - H	BEDROCK
			8	- 864.0 — -				TEST PIT TP2 TERMINATED AT 2.00 m Practical excavator refusal on rock			
			{	- 363.5 — -	-2.5 - - -						
			8	- 863.0 —	-3.0						
			8	- - 362.5 - -	-3.5						
L	LOGGED: CD						Cŀ	HECKED: MA	DA ⁻	ΓΕ: 22/1	10/2024



SHEET 1 OF 1

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE: 17/10/2024

SURFACE RL: 868.45 m AHD

COORDS: 720854.85 m E 6058804.27 m N MGA94 56 EXCAVATION METHOD: 14t excavator, 600mm bucket

LOC	LOCATION: Captains Flat Rail Corridor, Co Test Pit Information					Coppe	Copper Creek EXCAVATION METHOD: 14t excavator, 600mm bucket Field Material Information						
<u> </u>		Test Pit In	formatio	n			 	Field Material Inform	nation	nation			
WATER	DYNAMIC PENETROMETER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS		
Not Encountered				868.0 -	-0.5			FILL; comprising Siltstone COBBLES/BOULDERS, up to approximatley 600mm size, pale grey-brown, with fine to coarse angular gravels and fine to coarse grained sand, with silt, trace of clay in upper 0.2m	D - M		EMBANKMENT FILL With rubbish (ie. steel, plastic, etc.) to approximately 0.2m		
LC		PP70 - 100kPa	2xB 1.70m	866.5	-1.5		CL- CI	FILL; comprising Siltstone COBBLES/BOULDERS situated within a Gravelly Silty CLAY matrix, cobbles/boulders up to approximatley 600mm size, low to medium plasticity clay, orange-brown, medium to coarse angular gravel, with fine to coarse grained sand	w>PL		-		
				866.0	-2.40- -2.5 -3.0			TEST PIT TP3 TERMINATED AT 2.40 m Due to presence of large boudler					
LC	LOGGED: CD				ED: CD CHECKED: MA			DAT	E: 22/1	10/2024			



SHEET 1 OF 1

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE: 17/10/2024

SURFACE RL: 868.38 m AHD

COORDS: 720858.46 m E 6058799.74 m N MGA94 56 EXCAVATION METHOD: 14t excavator, 600mm bucket

LC	LOCATION: Captains Flat Rail Corridor, C										
		Test Pit Information			Field Material Infor	mation					
WATER	DYNAMIC PENETROMETER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
				868.0 -	- 0.40 -		SM	FILL; Silty Gravelly SAND, fine to coarse grained, dark grey-brown, fine to coarse angular gravels, with angular cobbles/lead ore fragments (up to approximately 80mm size)	D-M		FILL - Root mattress to approximately 0.15m -
pe			0.70m 2xB	- - - -	-0.5		CL- CI	FILL; comprising Siltstone COBBLES/BOULDERS situated within a Gravelly Silty CLAY matrix, cobbles/boulders up to approximatley 900mm size, low to medium plasticity clay, pale brown and pale orange-brown, medium to coarse angular gravels, with fine to coarse grained sand	w>PL		EMBANKMENT FILL
Not Encountered		-PP70kPa	0.90m D 1.00m	867.5 -	-1.0 -1.0						- - - -
Developed by Datgel			1.60m D 1.70m	867.0 -	1.5						From approximately 1.5m; Large boulders present in main excavation face, causing instability for excavator during excavation
d by gINI Professional,				866.5 -	2.00			TEST PIT TP4 TERMINATED AT 2.00 m Due to excavation instability			-
5>> 30/10/2024 11:56 Produce				866.0 -	-2.5						- - - -
10-LOGS.GPJ < <drawingfile< td=""><td></td><td></td><td></td><td>865.5 -</td><td>-3.0</td><td></td><td></td><td></td><td></td><td></td><td>- - -</td></drawingfile<>				865.5 -	-3.0						- - -
KCA_LIB_08.1_KCA_STANDARD.GLB_L0g_KCA_LESTPTLLUG_16510-LUGS.GPJ_<4Drawing-lie>> 3070/2024.11;36_Produced by gin Professional, Developed by Daige				865.0 -	-3.5						- - -
1_KCA_STANDAKD.GLB L				864.5	- - - - -						- - -
LIB O8	_OGGE	D: CD	·				CH	ECKED: MA	DA	ΓE: 22/1	10/2024



SHEET 1 OF 1

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE: 17/10/2024

SURFACE RL: 868.52 m AHD

COORDS: 720869.16 m E 6058788.24 m N MGA94 56 EXCAVATION METHOD: 14t excavator, 600mm bucket

LOCATION: Captains Flat Rail Corrid				
Test Pit Information	Field Material Inform			
WATER DYNAMIC PENETROMETER FIELD TEST SAMPLE SAMPLE RL (m AHD)	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/NG CONSISTENCY RELATIVE PENSITY STEATUR CONSISTENCY RELATIVE DENSITY STEATUR		
868.5	SM FILL; Generally comprising Silty Gravelly SAND, fine to coarse grained, dark grey and grey-brown, fine to carse angular gravels, with some lead ore gravel, trace of sandstone boulders (up to approximately 500mm size) GM FILL; Generally comprising Lead Ore Gravel, recovered as Silty Sandy GRAVEL, fine to coarse angular gravel, dark grey-black, fine to coarse angular gravel, dark grey-black, fine to coarse grained sand, with angular cobbles (up to approximately 100mm size) CL FILL; comprising Silty Gravelly CLAY, low plasticity, orange and dark orange, fine to coarse angular gravels (siltstone rock fragments), with siltstone/sandstone cobbles abundant throughout (up to approximately 150mm size), with some intermittent layers of lead ore TEST PIT TP5 TERMINATED AT 2.80 m Due to excavation instability	D EMBANKMENT FILL Rubbish present (ie. steel, glass, shards, plastic, asbestos sheeting, etc.) to approximately 1m. D-M From approximately 1.3m to 1.6m, large cavity formed within southern excavation face during excavation w>PL		
865.0 — 3.				
LOGGED: CD	CHECKED: MA	DATE: 22/10/2024		



SHEET 1 OF 1

PROJECT No: 16510

CLIENT: Ramboll Australia Pty Ltd PROJECT: Geotechnical Investigation

LOCATION: Captains Flat Rail Corridor, Copper Creek

DATE: 17/10/2024

SURFACE RL: 868.83 m AHD

COORDS: 720878.50 m E 6058778.05 m N MGA94 56 EXCAVATION METHOD: 14t excavator, 600mm bucket

LOCATION: Captains Flat Rail Corridor, Cop					rridor,	Сорре	•				
Test Pit Information							Field Material Information				
WATER	PENETROMETER	FIELD	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
				868.5 -	-0.5		SM	FILL; Generally comprising Silty Gravelly SAND, fine to coarse grained, dark grey-brown, fine to coarse angular gravels, with some cobbles/boulders (up to approximately 300mm size)	D-M		EMBANKMENT FILL Rubbish (ie. steel, rubber, glass etc.) present to ~0.6m
			1.20m	868.0 -	-1.0		CL- CI	FILL; Generally comprising Silty Gravelly CLAY, low to medium plasticity, dark orange and pale orange-brown mottled red-orange, fine to coarse angular gravels, abundant with angular lead ore cobbles (up to approximately 200mm size, black)	w>PL		-
Not Encountered		PP80kPa PP90 - 110kPa	2xB 1.40m D 1.50m	867.5 -	-1.5			From 1.7m to approximately 2.1m; layer of lead ore present in southern excavation face, black			_
		PP180 - 200kPa	2.60m D 2.70m	866.5 -	- 2.5		CL- CI	Silty CLAY, low to medium plasticity, pale grey mottled orange and dark orange, with some fine to coarse angular siltstone gravels, trace of fine to medium grained sand			
				865.5 -	-3.00	***		TEST PIT TP6 TERMINATED AT 3.00 m Limit of investigation			
LOC	GGE	D: CD					CH	ECKED: MA	DA	Ι ΓΕ: 22/	10/2024



Explanatory Notes - Soil Description

In engineering terms, soil includes every type of uncemented or partially cemented material found in the ground. In practice, if the material can be remoulded by hand in its field condition or in water it is described as a soil. The dominant soil constituent is given in capital letters, with secondary textures in lower case. The dominant feature is assessed from AS 1726:2017 – Geotechnical Site Investigations and a soil symbol is used to define a soil layer.

METHOD

Method	Description
AD/T	Auger Drilling with tungsten carbide bit
AD/V	Auger Drilling with V Bit
AS	Auger Screwing
AT	Air Track
BH	Backhoe
CT	Cable Tool Rig
DB	Washbore Drag Bit
DT	Diatube
E	Excavator
EH	Excavator with Hammer
HA	Hand Auger
HQ	Diamond Core-63mm diameter
N	Natural Exposure
NMLC	Diamond Core-52mm diameter
NQ	Diamond Core-47mm diameter
Percussion	Percussion Drilling
PT	Push Tube
RR	Rock Roller
V	Vacuum Excavation
WS	Washbore
X	Existing Excavation

WATER



Water level at date shown



Seepage

NOT ENCOUNTERED: The borehole/test pit was dry soon after excavation. Inflow may have been observed had the borehole/test pit been left open for a longer period.

NOT OBSERVED: The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.

SAMPLING

Sample	Description
В	Bulk Disturbed Sample
D	Disturbed Sample
SPT	Standard Penetration Test
U50	Undisturbed Sample - 50mm diameter
U75	Undisturbed Sample - 75mm diameter
ES	Soil Sample, Environmental
EW	Water Sample, Environmental
G	Gas Sample

SOIL CLASSIFICATION

The appropriate symbols are selected based on the result of visual examination, field tests and available laboratory test results, such as particle size analysis, liquid limit and plasticity index.

Group Symbol	Description
GW	Well graded gravel
GP	Poorly graded gravel
GM	Silty gravel
GC	Clayey gravel
SW	Well graded sand
SP	Poorly graded sand
SM	Silty sand
SC	Clayey sand
ML	Silt of low plasticity
CL	Clay of low plasticity
OL	Organic soil of low plasticity
CI	Clay of medium plasticity
MH	Silt of high plasticity
CH	Clay of high plasticity
OH	Organic soil of high plasticity
Pt	Peat, highly organic soil

MOISTURE CONDITION

For coarse grained soils, the following terms are used

Dry - Non-cohesive and free-running

Moist - Soil feels cool, darkened in colour

- Soil tends to stick together

Wet - Soil feels cool, darkened in colour

Soil tends to stick together, free water forms when handling
 For fine grained soils, the following moisture content (w) terms are used:

$$\begin{split} &w < PL &- \text{Moist, dry of plastic limit} \\ &w \approx PL &- \text{Moist, near plastic limit.} \\ &w > PL &- \text{Moist, wet of plastic limit.} \\ &w \approx LL &- \text{Wet, near liquid limit.} \\ &w > LL &- \text{Wet, wet of liquid limit} \end{split}$$

PLASTICITY

Soil plasticity is a measure of the range of water content over which a soil exhibits plastic properties. The classification of the degree of plasticity in terms of the Liquid Limit (LL) is as follows.

Description of Plasticity	Range of Liquid Limit for Silt	Range of Liquid Limit for Clay
Non-plastic	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

COHESIVE SOILS - CONSISTENCY

The consistency of a cohesive soil is defined by descriptive terminology such as very soft, soft, firm, stiff, very stiff and hard. These terms are assessed by the shear strength of the soil as observed visually, by hand penetrometer, dynamic cone penetrometer or vane shear values and by resistance to deformation to hand moulding.

A hand penetrometer may be used in the field or the laboratory to provide an approximate assessment of the unconfined compressive strength (UCS) of cohesive soils. Undrained shear strength

c_u = 0.5×UCS. Undrained shear strength values are recorded in kPa as follows:

Strength	Symbol	Indicative Undrained Shear Strength, c _u (kPa)
Very Soft	VS	≤12
Soft	S	>12 and ≤25
Firm	F	>25 and ≤50
Stiff	St	>50 and ≤100
Very Stiff	VSt	>100 and ≤200
Hard	Н	>200
Friable	Fr	_

COHESIONLESS SOILS – RELATIVE DENSITY

Relative density terms such as very loose, loose, medium dense, dense and very dense are used to describe silty and sandy material, and these are usually based on resistance to drilling penetration, Standard Penetration Test (SPT) N values or Perth Sand Penetrometer resistance.

Term	Symbol	Density Index	
Very Loose	VL	0 to 15	
Loose	L	15 to 35	
Medium Dense	MD	35 to 65	
Dense	D	65 to 85	
Very Dense	VD	>85	

SOIL PARTICLE SIZE DESCRIPTIVE TERMS

Fraction	Name	Subdivision	Size (mm)				
Oversize	Boulders		>200				
Oversize	Cobbles		63 to 200				
		Coarse	19 to 63				
	Gravel	Medium	6.7 to 19				
Coarse		Fine	2.36 to 6.7				
grained soil		Coarse	0.6 to 2.36				
	Sand	Medium	0.21 to 0.6				
		Fine	0.075 to 0.21				
Fine	Silt		0.002 to 0.075				
grained soil	Clay		<0.002				



Explanatory Notes - Rock Description

METHOD

Refer to soil description sheet.

WATER

Refer to soil description sheet.

ROCK QUALITY

The defect spacing is shown where applicable and the Rock Quality Designation (RQD) and Total Core Recovery (TCR) for each core run is given where:

$$TCR = \frac{Length of core recovered}{Length of core run} \times 100\%$$

$$RQD = \frac{Sum \text{ of axial length of sound core pieces >100mm long}}{Length \text{ of core run}} \times 100\%$$

ROCK MATERIAL WEATHERING

Rock material weathering is described using the abbreviations and definitions used in AS1726:2017– Geotechnical Site Investigations.

Term		Abbre	viation	Definition	
Residual S	Soil	RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.	
Extremely weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.	
Highly Weathered	Distinctly Weathered	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to deposition of weathering products in pores.	
Moderately Weathered	a	MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.	
Slightly Weathere	d	SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.	

Where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock the term 'Distinctly Weathered' may be used. 'Distinctly Weathered' is defined as follows: 'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in the pores'. There is some change in rock strength.

ROCK MATERIAL STRENGTH

Rock strength is described using AS1726:2017– Geotechnical Site Investigations and ISRM – Commission on Standardisation of Laboratory and Field Tests, 'Suggested method of determining the Uniaxial Compressive Strength of Rock materials and the Point Load Index' as follows:

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Point Load Index Is ₅₀ (MPa)
Very Low	VL	0.6 to 2	0.03 to 0.1
Low	L	2 to 6	0.1 to 0.3
Medium	M	6 to 20	0.3 to 1
High	Н	20 to 60	1 to 3
Very High	VH	60 to 200	3 to 10
Extremely High	EH	>200	>10



Diametral Point Load Index test.



Axial Point Load Index test.

DEFECT SPACING/BEDDING THICKNESS

Depending on the project, may be either described as mean perpendicular spacing within a set of defects or bedding, or as the spacing between all defects within the rock mass.

Term	Defect Spacing	Bedding	
Extremely closely spaced	<6 mm	Thinly laminated	
	6 to 20 mm	Laminated	
Very closely spaced	20 to 60 mm	Very thin	
Closely spaced	0.06 to 0.2 m	Thin	
Moderately widely spaced	0.2 to 0.6 m	Medium	
Widely spaced	0.6 to 2.0 m	Thick	
Very widely spaced	>2 m	Very thick	

DEFECT DESCRIPTION

Туре	Definition
JT	Joint
BP	Bedding Parting
CO	Contact
CS	Clay Seam
CZ	Crush Zone
DK	Dyke
DZ	Decomposed Zone
FC	Fracture
FZ	Fracture Zone
FL	Foliation
FLT	Fault
VN	Vein
SM	Seam
IS	Infilled Seam
SZ	Shear Zone

Planarity	Roughness	
PR – Planar	VR – Very Rough	
CU – Curved	RF – Rough	
U – Undulating	S – Smooth	
ST – Stepped	POL – Polished	
IR – Irregular	SL – Slickensided	

Symbol	Coating or Infill	
CA	Calcite	
Clay	Clay	
CN	Clean	
Fe	Iron oxide	
KT	Chlorite	
Qz	Quartz	
Χ	Carbonaceous	
SN	Stain	
VNR	Veneer	

The inclinations of defects are measured from perpendicular to the core axis.

Ramboll

Appendix 7 Surveyed Coordinates

Туре	SampleID	X (GDA94 MGA55)	Y (GDA94 MGA55)	X (GDA2020 MGA55)	Y (GDA2020 MGA55)	Note
Borehole	BH1	720875.996	6058769.56	720876.5267	6058770.971	Derived from survey data
Borehole	BH2	720857.6648	6058792.108	720858.1955	6058793.519	Derived from survey data
Borehole	ВН3	720855.0968	6058794.414	720855.6275	6058795.825	Derived from survey data
Hand auger	HA1	720977.5202	6058716.333	720978.0508	6058717.744	
Hand auger	HA10	721011.4824	6058665.968	721012.013	6058667.379	
Hand auger	HA11	721005.4762	6058657.458	721006.0068	6058658.869	
Hand auger	HA12	721004.4227	6058648.309	721004.9533	6058649.72	
Hand auger	HA13	720994.5791	6058646.031	720995.1097	6058647.442	
Hand auger	HA14	720995.8218	6058635.465	720996.3524	6058636.876	
Hand auger	HA2	720981.7323	6058727.963	720982.2629	6058729.374	
Hand auger	HA3	720988.5554	6058716.656	720989.086	6058718.067	
Hand auger	HA4	720985.5456	6058708.125	720986.0762	6058709.536	
Hand auger	HA5	720995.6009	6058707.915	720996.1315	6058709.326	
Hand auger	HA6	720997.2386	6058698.548	720997.7692	6058699.959	
Hand auger	HA7	721003.3917	6058695.705	721003.9223	6058697.116	
Hand auger	HA8	721010.6192	6058683.538	721011.1498	6058684.949	
Hand auger	HA9	721010.7696	6058673.869	721011.3002	6058675.28	
Test pit	TP1	720880.3688	6058780.536	720880.8995	6058781.947	Derived from survey data
Test pit	TP2	720873.6382	6058756.411	720874.1689	6058757.822	
Test pit	TP3	720854.3182	6058802.856	720854.8489	6058804.267	Derived from survey data
Test pit	TP4	720857.9278	6058798.332	720858.4585	6058799.743	Derived from survey data
Test pit	TP5	720868.634	6058786.826	720869.1647	6058788.237	Derived from survey data
Test pit	TP6	720877.965	6058776.64	720878.4957	6058778.051	Derived from survey data