

**DETAILED SITE (CONTAMINATION) ASSESSMENT
PART 1 MCINTOSH DRIVE, MAYFIELD WEST**

Prepared for AUSGRID

Prepared by RCA AUSTRALIA

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Attention: Radha Rockwood

**DETAILED SITE (CONTAMINATION) ASSESSMENT
PROPOSED BATTERY ENERGY STORAGE SYSTEM
PART 1 MCINTOSH DRIVE, MAYFIELD WEST**

EXECUTIVE SUMMARY

This report presents the findings of a detailed site (contamination) assessment undertaken for the operational footprint of a proposed Battery Energy Storage System (BESS, referred to as the Project) within the eastern portion of 1 McIntosh Drive, part of the Steel River Industrial Estate in Mayfield West, Newcastle, NSW. The works have been undertaken at the request of Ausgrid as part of their evaluation of the site's suitability.

Works for this assessment comprised a review of the validation report (Ref [10]) which applies to the site along with historical assessments, maps, photographs and various registers in relation to polluting / contaminated land and soil types/ geology. Intrusive assessment was undertaken of the materials situated to a maximum of two (2) metres below ground surface (mbgs) in what was considered representative of materials used in a capping layer during remediation; no sampling was undertaken of the underlying material as it was understood based on the validation report (Ref [10]) to be contaminated.

The site was formerly within Platt's Channel and was formed by filling with steelworks waste and byproducts from between 1954 and 1966 when BHP Billiton (BHPB) acquired the land. The site was then used as an equipment hardstand as part of the operation of the steelworks and associated industries until the late 1990s when the steelworks closed. Remediation was undertaken at the site and the majority of the larger area of the Steel River Estate due to historical assessment of the presence of significant concentrations of polycyclic aromatic hydrocarbons (PAH) along with tar and oil residues. The capping remediation was verified to render the site suitable for commercial / industrial land use in 2004 (Ref [10]) however the site has not had any formalised use other than for sporadic storage of construction materials and placement of soil stockpiles, considered likely from adjacent construction of a substation.

No visual indications of contamination were identified, and olfactory indications were limited to slight hydrocarbon odours within the subsurface strata in the northern portion of the site. No contaminant concentrations were identified in excess of the human health criteria (Ref [5] and Ref [6]) for commercial / industrial land use and concentrations in excess of the ecological criteria (Ref [5]) are not considered to be of significance for the Project.

RCA considers that the site is suitable for the proposed use without further assessment or remediation.

Management of all excavation works, particularly those at depths below the capping layer, will be needed to ensure exposure via inhalation of dust, ingestion of dust and soil (incidental from that adhered to skin) and dermal contact is minimised. Management procedures are also to prevent impact to the environment via dust or soil and water migrations.

All excavated soil must be either reinstated at the appropriate depth or removed from the site in accordance with the NSW EPA waste framework.

Groundwater has not been assessed and must not be extracted without a prior assessment as to its suitability for the proposed use and the requirement for the implementation of management controls.

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1 INTRODUCTION

This report presents the findings of a detailed site (contamination) assessment undertaken for the eastern portion of 1 McIntosh Drive within the Steel River Industrial Estate, situated in Mayfield West, Newcastle, NSW.

Based on the provided project details, it is understood that the site is currently undeveloped, and it is proposed to be developed for a Battery Energy Storage System (BESS) over an area of approximately 1.5 ha (referred to as the Project).

RCA have referred to the area of assessment as ‘the site’ in this report, noting that it is broadly equivalent to lands identified as “Operational Footprint” in documentation relating to the Project. The locality and layout of the site is shown in **Drawing 1, Appendix A**.

The report has been prepared at the request of Ausgrid to evaluate the suitability of the site for the Project with regards to its contamination status.

1.1 SCOPE

The scope of work for this assessment comprised:

- Review of site history information.
- Intrusive assessment and collection of soil samples.
- Analysis of soil samples for contaminants of concern and comparison to criteria considered relevant for the proposed land use.
- Preparation of this report.

1.2 OBJECTIVE

The objective of this investigation is to assess the contamination status of the site, to determine whether it is suitable for the Project or otherwise provide recommendations for further assessment, remediation and/or management.

1.3 REGULATORY COMPLIANCE

Preparation of this report was undertaken with reference to (but not limited to) the following regulatory guidance documents and standards:

- *Contaminated Land Guidelines: Sampling Design* (Ref [1]). This document was used as a reference with regards to the number of samples required for characterisation of the site’s contamination status.
- *Guidelines for Consultants Reporting on Contaminated Sites*, (Ref [2]). This document was used as a reference for the derivation of the scope of work and what information was to be included in this report.
- *Guidelines for the NSW Site Auditor Scheme* (3rd Ed, (Ref [3])). This document was used as a reference for the derivation of the scope of work and what information was to be included in this report.
- *State Environmental Planning Policy (Resilience and Hazards) 2021*, (Ref [4]). This report has been provided to satisfy the requirements of the SEPP which require an assessment that the site is suitable or can be made suitable for the proposed use.

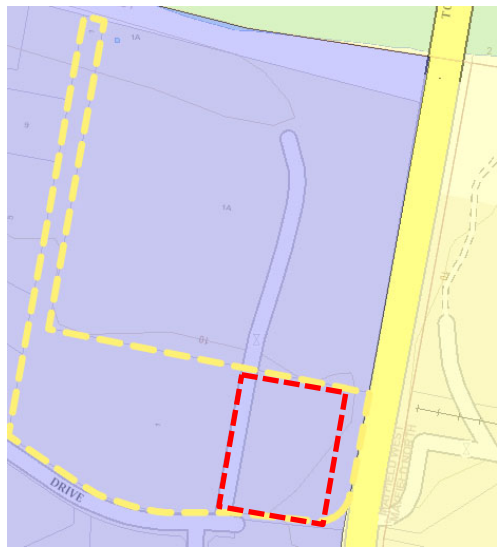
- *National Environment Protection (Assessment of Site Contamination) Measure*, (Ref [5]). These guidelines were utilised as guideline criteria for the assessment of the contamination status of soil at the site and quality assurance.
- *Technical Report 10, Health screening levels for petroleum in soil and groundwater* (Ref [6]). These guidelines were utilised as criteria for the assessment of the contamination status of soil at the site.
- *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, (Ref [7]). These guidelines were utilised as a guide for the methodology for the collection of soil samples and quality assurance.

2 SITE IDENTIFICATION AND DESCRIPTION

The site is located in the eastern portion of Lot 16 in DP 270249; 1 McIntosh Drive, Mayfield West, NSW 2304 and is within the former BHP Billiton (BHPB) Steel property known as Steel River Industrial Estate.

Additional site details are shown in **Table 1**.

Table 1 *Site Details*

Current zoning (Ref [8])	 E4 – General Industrial (Lot as per yellow dashed line and site as per red dashed outline)
Proposed use	Proposed development of a Battery Energy Storage System (BESS)
Size of site	~1.5 ha
Land use to the:	
North	General industrial land use (E4) – Recycling facility
South	General industrial land use (E4) – Concrete production facility
East	Tourle St (B63) and further former BHPB land (SP1 Special Activities) being used for industrial purpose.
West	General industrial land use (E4) – Data Centre and vacant land, further electrical substation.
Nearest sensitive receptor (human health)	Childcare facility approximately 365 m to the southwest and residential dwellings of Mayfield approximately 400 m to the south.

Nearest sensitive receptor (environmental)	The south channel of the Hunter River is located approximately 300 m north of the site.
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Drawing 1, Appendix A shows the locality and the layout of the site.

The Project will contain rows of ‘megapacks’ with internal access roads between. Currently there is only a concept design.

3 SITE HISTORY AND BACKGROUND INFORMATION

3.1 PREVIOUS INVESTIGATIONS

3.1.1 HISTORICAL AND ARCHAEOLOGICAL VALUES (REF [9])

An assessment of the historical and archaeological values of BHPB land adjacent to Tourle Street, Mayfield West (Steel River Industrial Estate) was prepared for BHPB in 1996 (Ref [9]).

The purpose of the assessment was to determine the nature of the historical and archaeological values that may affect the proposed development of land into the (now) Steel River Industrial Estate. As the majority of the land was known to be reclaimed land with no archaeological potential, only the southeast hill retained the original topography and soil cover.

The assessment identified that land use was broken up into four (4) main periods between 1822 – 1996:

- John Laurio Platt’s farm 1822 – 1836: The area was one of the first land grants awarded to a free settler in Newcastle. The grant was officially made on 30 June 1823, at which point Platt established a farm and milling operation. By 1829, coal mining activities had also commenced on the property.
- The Australian Agricultural Company (AAC) 1836 – 1933: The area was taken over by the AAC in 1836 and used to extract coal amongst other endeavours. A house was built in 1885 for the AAC managers.
- The Catholic Diocese of Newcastle 1933 – 1968: The land was taken over by the Diocese of Newcastle and the Murray-Dwyer Orphanage was established. The orphanage operated until 1968 and by 1940, BHPB started to purchase parts of the orphanage land and Platt’s original grant. In 1950, BHPB came to an agreement with the government that it would exchange 337 acres of company owned land for an area which included Platt’s Channel, a potential 257 acres. The channel was gradually infilled in the 1950s.
- BHPB use 1969 – 1999: BHPB purchased the remaining lands and by 1969, the eastern part of Platt’s Channel had been filled. A BHPB refractory building was constructed on the southeast hill in place of the AAC house. The land was then used for waste storage and disposal until the late 1970s.

The report concluded that the land was regionally culturally significant because of its regional historic associations however, as the majority of the land is reclaimed land, there was considered to be minimal archaeological potential within the lands.

3.1.2 REMEDIATION VALIDATION REPORT (REF [10])

A remediation validation report for the Steel River Estate was produced for BHPB by URS Australia in 2004 (Ref [10]). It outlined the history and land uses during the operation of the BHP steel works and the subsequent contamination associated with waste disposal on the Estate. RCA has summarised the presented history as:

- Until the mid-1950s, the area now known as the Steel River Industrial Estate consisted of natural features including a riverbank, a shallow waterway called Platt's Channel, a mudflat referred to as Spit Island, and a region identified as the southeast hill area. This entire area spans approximately 104 hectares.
 - The site is situated in the southeastern portion of the Steel River Industrial Estate. The site is predominantly comprised of reclaimed land that once formed part of the Platt's Channel as has been inferred to **Drawing 1, Appendix A**.
- In 1950, legislation passed by the NSW parliament allowed for the reclamation of Platt's Channel, connecting Spit Island to the mainland. From that point on, the area west of Tourle Street was extensively utilised by BHPB for waste storage and disposal, as well as for storing raw materials and spare parts.
- Between 1963 and 1977, approximately 5 million cubic metres of fill, including general waste and coal washery reject (CWR), was deposited at the (now) Steel River Estate. The waste materials included bricks, ash, shale, tar, dolomite, lime, spent acid, blast furnace slag, open hearth slag, steelmaking slag, fly ash, and other byproducts of steel production. Portions of the Estate were subsequently covered with CWR produced at the nearby steelworks.

Numerous environmental investigations were historically undertaken by BHPB and revealed soil, groundwater, and gas contamination, as well as elevated organic contaminants. The key contaminants included polycyclic aromatic hydrocarbons (PAH) in surface materials, as well as tar and oil residues. Based on such findings, it was concluded that remediation would be required prior to redevelopment for industrial purposes.

The primary objectives for the remediation of the BHPB Steel River Estate, as presented in the remedial action plan/environmental impact statement (RAP/EIS, Ref [11]), focused on transforming the land for industrial and commercial development, mitigating risks associated with historical contamination from fill materials, and implementing environmental safeguards to prevent unacceptable groundwater discharge impacts on the Hunter River. These goals aimed to address both environmental and human health concerns while preparing the land for future use.

The remediation of the BHPB Steel River Estate involved a comprehensive set of activities that focused on recontouring and capping to ensure effective drainage toward the Hunter River while minimising groundwater recharge. CWR and on-site materials were used for reshaping and capping to limit exposure to contaminants, while highly contaminated materials such as tar and oil were safely contained within designated areas.

Remediation, by the capping with approximately 2 m of CWR, of the Steel River Estate was conducted from July 1998 to April 2001 and was considered (Ref [10]) to have effectively addressed historical contamination and achieved its primary objectives of mitigating risks to human health and the environment. The extent of remediation covered approximately 80 ha excluding the southeastern hill, which was considered to require further assessment for alternate uses. No remediation of groundwater was undertaken as discharge to the Hunter River was deemed to have no significant adverse effects based on assessments and sediment studies. Recontouring and redevelopment significantly reduced groundwater recharge and potential contamination flow.

The validation process confirmed the effectiveness of the remediation, and post-remediation monitoring plans were implemented to ensure ongoing compliance and environmental safety. The land was deemed suitable for future industrial and commercial redevelopment (Ref [10]), provided developments align with development guidelines, which were intended to ensure environmental responsibility and worker health safety.

3.1.3 GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION (REF [12])

A geotechnical and environmental investigation was undertaken for the development of the Ausgrid substation in the western portion of Lot 16 in 2006 (Ref [12]). The purpose of the report was to describe the surface and subsurface geophysical and geochemical conditions and provide recommendations for preparation for the substation.

The report noted the proposed substation lay near the former Platts Channel. The report also noted the history of filling and remediation as described above. Contaminants of concern were considered to comprise manganese, chromium, PAH, total petroleum hydrocarbons (TPH), ethylbenzene and xylenes.

A summary of soil sampling results from this assessment relevant to the contamination status are shown in **Table 2**.

Table 2 Summary of results

No. of Samples	Analyte	Min	Max	Mean	95% UCL mean
29	Benzene	<0.2	<0.2	<0.2	-
29	Toluene	<1	<1	<1	-
29	Ethylbenzene	<1	<1	<1	-
29	Total Xylenes	<3	<3	<3	-
29	TPH C ₆ -C ₉	<5	<5	<5	-
29	TPH C ₁₀ -C ₃₆	<110	800	277	324
29	Benzo(a)pyrene	<0.5	14	2.44	3.41
29	PAH	<8	154.85	29.5	40.0
29	Arsenic	<5	53	16.1	20
29	Cadmium	<0.5	1	0.36	0.5
29	Chromium	<5	780	156	215
29	Copper	<5	50	26.0	29
29	Nickel	<5	140	45.8	58
29	Lead	<5	120	43.1	52
29	Zinc	<5	1200	214	287

All concentrations are in mg/kg

UCLmean – upper confidence limit of the average of the data set

Smaller font used represent results less than the laboratory detection limit

Concentrations of PAH and chromium were identified in excess of the then current criteria within shallow materials (0.5-1.3 m below the ground surface (mbgs)) and were considered to be consistent with historically identified contaminants. Therefore, environmental and occupational health and

safety controls presented in the environment management plan (EMP, Ref [13]) were valid such that no remediation was recommended.

3.1.4 STOCKPILE CONTAMINATION ASSESSMENT (REF [14])

Classification (Ref [14]) of two (2) stockpiles of material situated at the proposed Ausgrid substation was undertaken in 2007 prior to its construction to facilitate their removal. The material was understood to have been sourced from nearby construction and comprised sandy, gravelly clay material with a high slag and coal refuse content (up to 80%) with some building rubble, concrete pieces and plastic.

Based on the results of analysis, the stockpiled materials were considered suitable to remain at the proposed Ausgrid substation as the chemicals of concern were below the then relevant human health guideline criteria for industrial land use. Differential waste classification was ascribed to the stockpiles in the event that these were removed to a licensed waste facility.

RCA notes that it is unknown whether these materials were retained within the area of the Ausgrid substation construction or elsewhere within the Lot, or whether these were removed from the Lot.

3.2 SITE NOTIFICATIONS

RCA did not undertake a review of the Section 10.7 Planning Certificate as specified under the *Environmental Planning and Assessment Regulation 2000* (Schedule 4), as it was presumed that the contamination issues associated with the site were associated with the former use of the site by BHPB as described in the earlier section. It is recommended that the Certificate be reviewed for non-contamination related constraints.

RCA reviewed available information of City of Newcastle Council website related to building and development on the site and identified twelve (12) relevant applications approved by the council. The applications relate to the construction of an electrical substation and a data storage facility in the western and central portions of the site and are outlined below:

- Energy Australia, Electricity substation buildings and associated plant; application No. CC2007/1012 was lodged on the 6th of July 2007.
- Energy Australia, Electricity substation buildings and associated plant; application No. DA2007/1012 was lodged on the 6th of July 2007.
- Energy Australia, Modification to part of landscaped area for temporary accommodation of equipment storage (up to 12 months); application number DA2007/1012/02 was lodged on the 18th of February 2009.
- Edge Data Centres Pty Ltd, Data storage facility (storage premises); application No. DA2020/00422 was lodged on the 27th of April 2020.
- Edge Data Centres Pty Ltd, Modification - Data Storage Facility - changes to plan and conditions of consent; application No. DA2020/00422.01 was lodged on the 13th of August 2020.
- Leading Edge Data Centres, Data storage facility (storage premises) early works footings; application number CC2020/00791 was lodged on the 14th of September 2020.
- Edge Data Centres Pty Ltd, Data storage facility (storage premises) stage 1; application number CC2020/00941 was lodged on 14th of September 2020.
- Edge Data centres Pty Ltd, Sec 4.55(1A) modification - data storage facility - changes to consent conditions; application No. DA2020/00422.02 was lodged on the 19th of October 2020.

- Edge Data Centres Pty Ltd, Data Storage Facility (storage premises), Occupation certificate application No. OC2021/00304 was lodged on the 13th of April 2021.
- Alpha Distribution Ministerial Holding Corporation, Edge Data Centres Pty Ltd, Data Storage Facility (storage premises), Occupation certificate application No. OC2021/00581 was lodged on the 28th of June 2021.
- Alpha Distribution Ministerial Holding Corporation, Data storage facility (BCA Class 8); fire safety compliance application No. FS2022/1824 was lodged on 25th of July 2024.
- Ausgrid, 1 into 2 lot subdivision; application No. DA2024/00993 was lodged on the 3rd of December 2024.

3.3 HISTORICAL MAPS AND PHOTOGRAPHS

RCA undertook a review of historical Port of Newcastle maritime maps from 1894, 1902, 1910, 1911, 1914 and 1916. Only the 1910 map covered the site, and it shows that it is still in its natural form, prior to any interaction with BHPB. The 1910 map is shown below in **Figure 1**.

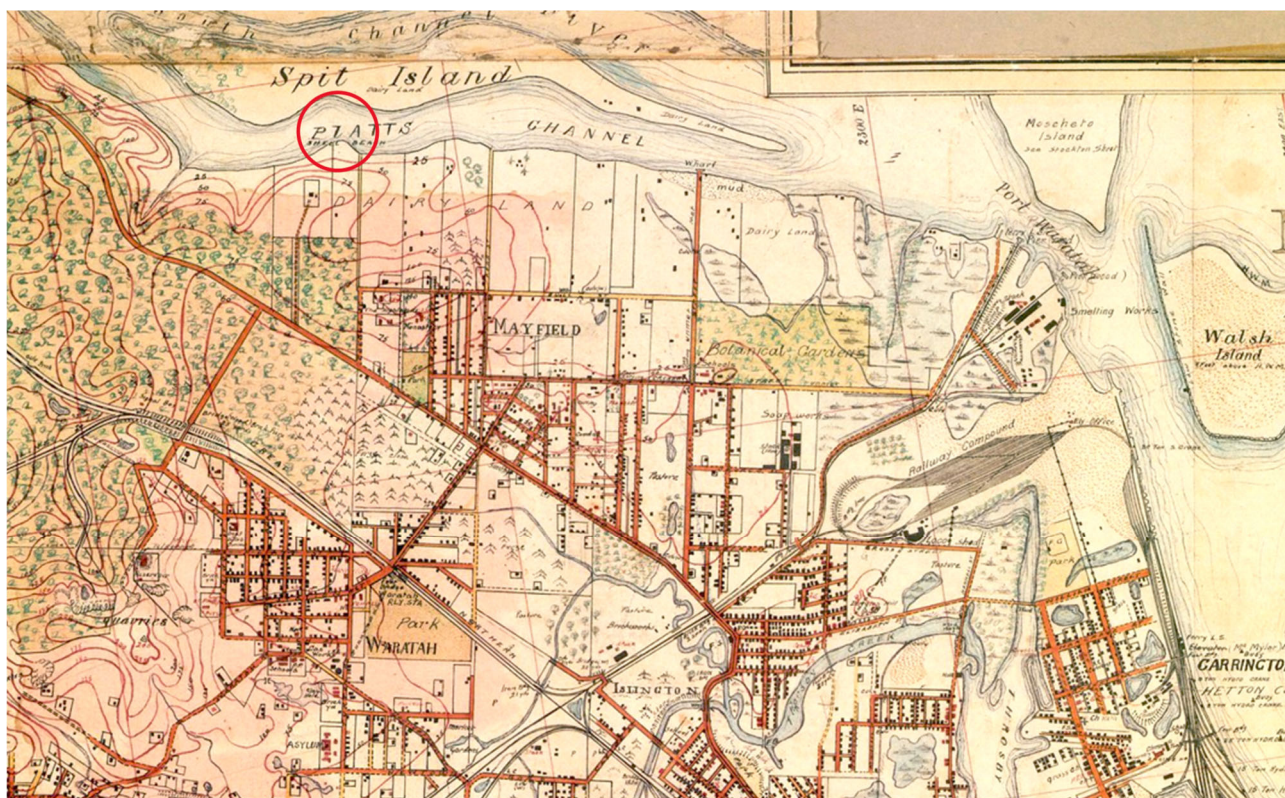


Figure 1 1910 Port of Newcastle maritime map – the area of the site is outlined in red.

RCA undertook a search of the Historical Land Records Viewer³ for the Lot reference and the Parish of Newcastle, and the University of Newcastle's *Living Histories* website for Mayfield, Steel River, BHPB, Platt's Channel, The Australian Agricultural Company (ACC), Shell Beach Park and the Murray Dwyer Orphanage. Five (5) district land maps considered as having relevance to the site as included in **Figure 2** below. The 1854 and 1892 maps indicate that the site is undeveloped and exists within Platt's original grant. The 1912 and 1919 maps show the location of a recreation area known as Shell Beach Park that is situated approximately where the site is located. The 1976 map shows the location of the site after Platt's Channel has been filled by BHPB.

³ <http://hlrv.nswlrs.com.au/pixel.htm>

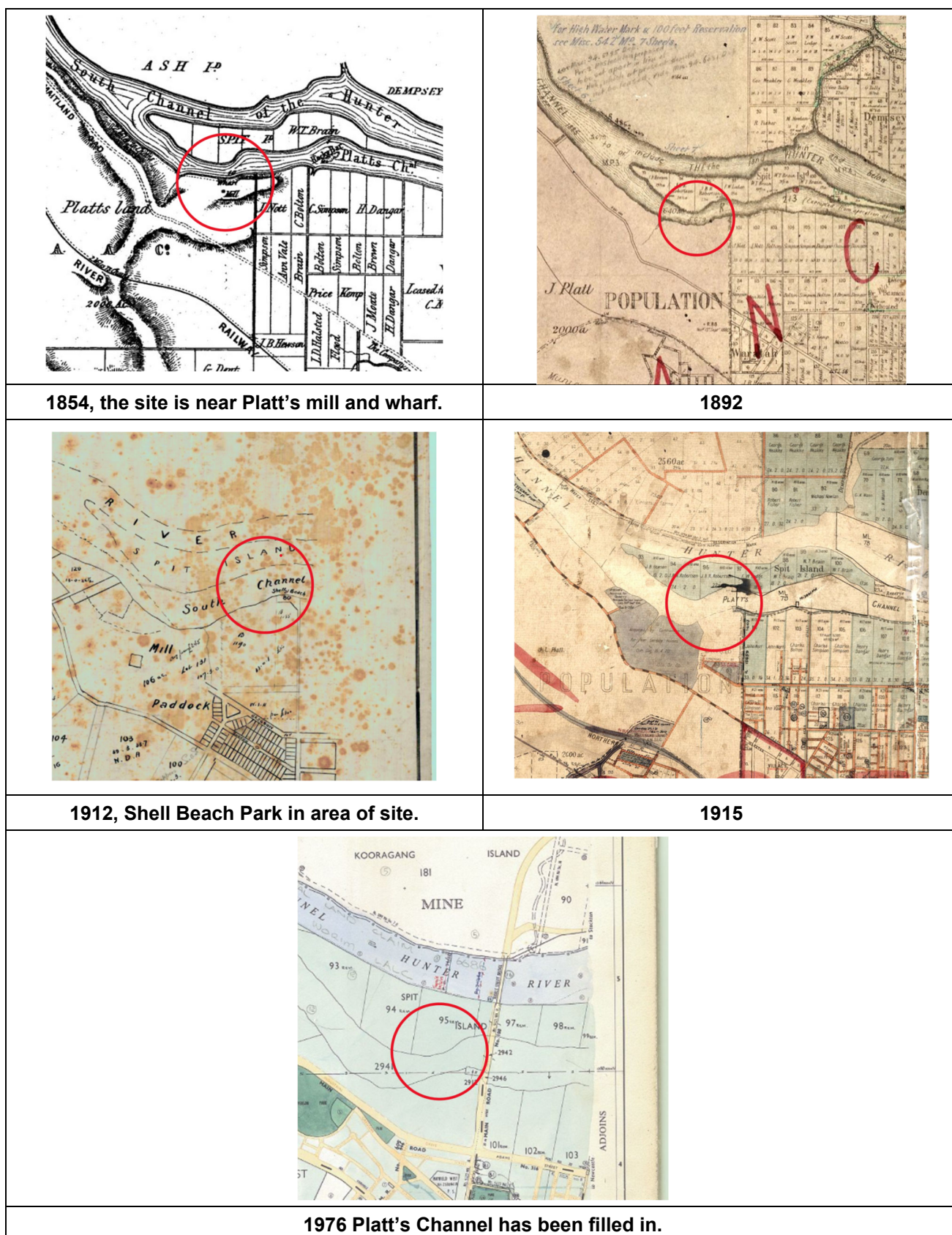


Figure 2 Extract of 1976 Land District Map, the area of the site is outlined in red.

RCA undertook a search through the Newcastle Library⁴ for photographs relevant to the site and identified 1944 and 1948 aerial photographs and two (2) records for Mayfield West. One of the records was stated to depict the Tourle Street Bridge in 1971 from the northern bank and did not show the site. The other was titled “Filling up Platt’s Channel” from 1953. The aerial images and 1953 photograph are shown below in **Figure 3**.

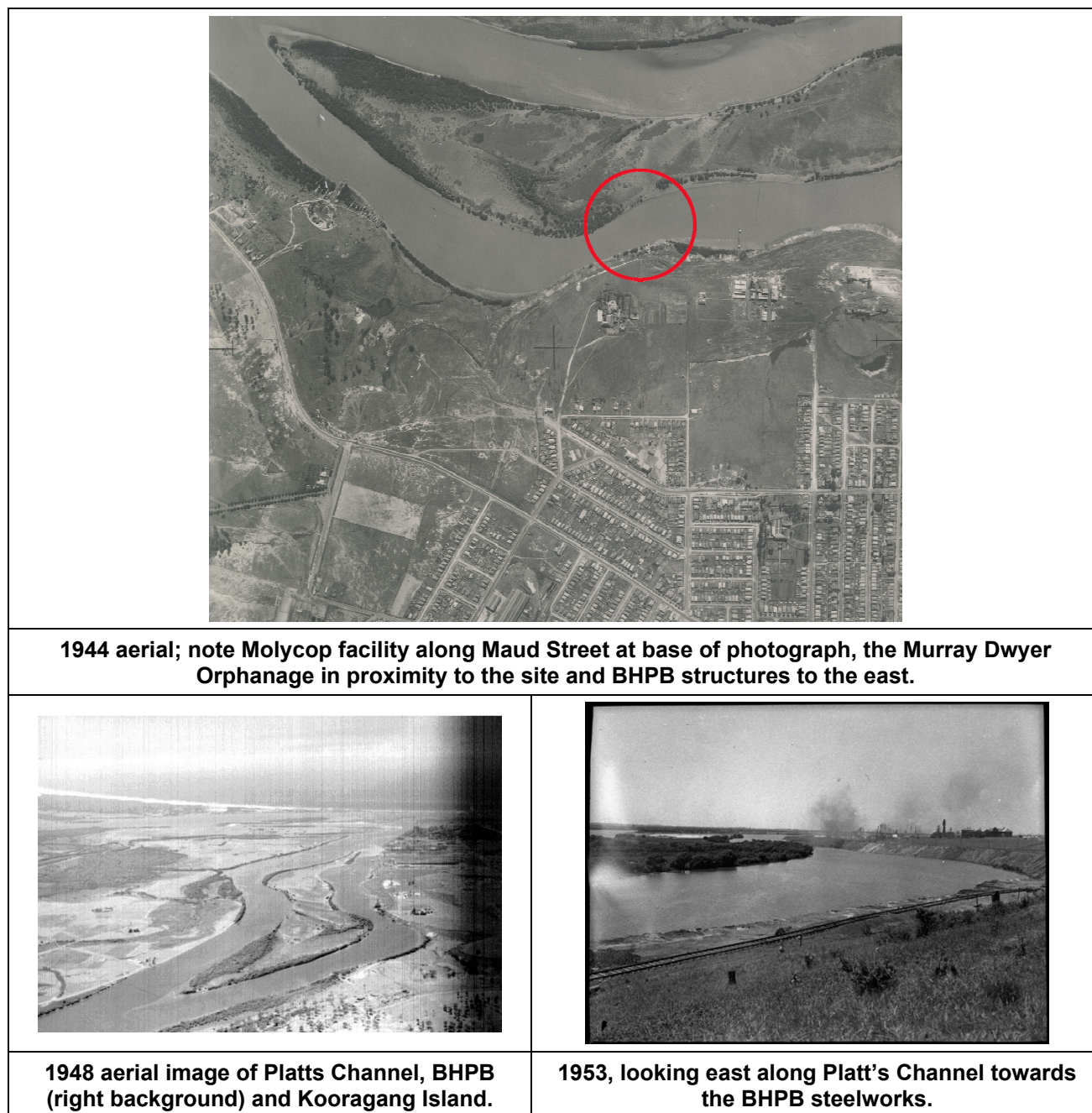


Figure 3 Aerial photographs of site area and photograph of Platts Channel

⁴ <http://www.newcastle.nsw.gov.au/Library/Heritage-History/Search-the-Collection/Hunter-PhotoBank>

RCA undertook a search through the State Library of NSW⁵ and identified multiple images of Mayfield including of the BHPB steelworks. Platts Channel and Spit Island were visible in the background of several however not to sufficient resolution to show details of the site area. There were two (2) photographs of 'Mayfield West Dump' from 15 June 1954 which, based on the proximity to the River, are considered to relate to the Steel River Estate rather than the former landfill at Stevenson Park. There are insufficient landmarks for certainty in the first image and it is considered likely that the second image shows the Murray Dwyer Orphanage in the background such that it depicts filling to the west of the site. The images are presented in **Figure 4** below.



Figure 4 Images of 'Mayfield West Dump'

RCA reviewed historical aerial photographs and **Table 3** summarises the observations at the site and the surrounding environment.

Table 3 Aerial Photograph Review

1954 (Black and white)	The site seems to be largely in its original natural state and similar to the 1944 image although it appears that foreshore has changed slightly, likely through natural causes although potentially filling. The majority of the surrounding area is cleared land; Murray Dwyer Orphanage remains unchanged from 1944 however there has been an expansion to the industrial buildings to the southeast of the site. Platt's Channel appears to be in the early stages of being filled to the east of the site, as machinery can be seen working on a section of the channel. The residential area of Mayfield has been well developed, BHP Steelworks and associated industries are present, as is Molycop (formerly Comsteel) and what is now known as 'Monastery Residence' (former Redemptorist Monastery).
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⁵ <https://archival.sl.nsw.gov.au/>

1966 (Black and white)	The site has been formed by filling of Platt's Channel, connecting Spit Island to Mayfield West. Access roads and contouring works can be seen in progress in the area of the site. To the west of the site there are two (2) large powerline structures, the remainder of Platts Channel and there has been expansion of commercial development; Stevenson Park appears to be under construction. To the east of the site Tourle Street and the Tourle Street bridge have both been built, although it is unknown whether these are available for public use, and BHPB has expanded out onto the reclaimed land that was Platt's Channel. There are what appear to be small structures to the north of the site; given the filling works it is considered these are likely to be demountable / temporary structures, and there are significant stockpiles in the north and northeast of the site. The industrial area to the southeast of the site appears to have grown with more structures being built however the Orphanage does not appear to have altered.
1976 (Colour)	The site appears to be primarily a hardstand area with a road along the northern boundary connecting the land to the BHPB property via a bridge across Tourle Street. The site appears to be used for equipment storage. Significant recontouring and vegetation removal have been carried out directly north of the site, with the area seemingly comprising a hardstand and used for equipment storage. Similarly, the northeast section of the site has also been recontoured and repurposed for storage of both equipment and coal stockpiles. BHPB and the associated industries have expanded further. Some of the Orphanage buildings have been removed.
1985 (Black and white)	The site remains a hardstand although with no visible storage being undertaken. There appears to be either stockpiles or vegetation in the western portion. The surrounding area also appears mostly unchanged, except for a new structure located northeast of the site on the opposite side of Tourle Street and lesser material storage to the north of the site.
1990 (Colour)	The site appears to be largely unchanged from the 1985 photograph and continues to be used for material and equipment storage. There is vegetation along the eastern boundary and an access road from the area of the Orphanage. The Delta E.M.D. plant has been constructed directly to the north of the site and the Orphanage site appears to have been repurposed with a large hardstand in its vicinity. The remainder of the surrounding appears mostly unchanged.
1998 (Colour)	The site appears to still be partially used for material storage at its northern extent only; vegetation has regrown over a large portion of the site. There has been a reduction in the stockpiled materials however in general the BHPB lands are unchanged; there is no change at the Delta EMD site. The Orphanage building has been demolished, and the current NSW Fire facility is present.
2001 (Colour)	The site has been cleared of the majority of vegetation and stored materials and what is presumed to be CWR used to cap the site for the remediation works is visible on the surface. Vegetation remains on the eastern boundary. The Steel River remediation works appear to be nearing completion in the area of the site; Steel River Boulevard, McIntosh Drive, Murray Dwyer Circuit and Laurio Place are constructed. The Delta E.M.D. plant to the north of the site remains operational and unchanged, and the BHPB site and associated industries appear unchanged.

June 2005 (Colour)	The site remains unused; vegetation has regrown on the site. The bridge that connected the site to the eastern side of Tourle Street has been removed. The remediation works for the Steel River Industrial Estate appear to have been largely completed, and new buildings have been constructed to the west of the site including the CSIRO, and the current childcare facility to the southwest. An aboveground pipeline in the land east of Tourle Street has been demolished and the main BHPB steelworks infrastructure has been demolished however the associated industries appear to be unchanged. The stockpiles, SP1 and SP2, outlined in Section 3.1.4 above, can be seen in the southwestern and northwestern areas of Lot 16.
January 2007 (Colour)	The site remains largely unchanged since the 2005 photograph, with concrete blocks now visible in the northern corner and a slight increase in vegetation cover. Additional development has occurred within the Steel River Industrial Estate, with more buildings constructed to the west of the site. Apparent capping / hardstand construction has been undertaken to the immediate east of Tourle Street however otherwise the surrounding area remains generally unchanged.
September 2009 (Colour)	Parts of the site have been cleared the northwestern areas appears to be used for stockpiling of soil from a nearby project in the Lot; what appears to be orange PVC pipes or rolls of geofabric are also present. A fence (presumed to be the current black steel) has been installed, running parallel to the eastern boundary and the concrete blocks removed. There is what appears to be a small, fenced compound in the southeastern corner of the site. The current substation and a hardstand area have been built directly to the west of the site within the Lot and the stockpiles are no longer visible. Further development has occurred within the Steel River Industrial Estate. There are no apparent changes at the Delta E.M.D. plant, although it is noted that it was decommissioned in 2008. A new eight (8) span prestressed concrete girder bridge has been constructed to the immediate east of the steel lattice truss bridge (construction from August 2007 to May 2009) and Tourle Street realigned accordingly from north of the site. The remaining surrounding area remains largely unchanged.
September 2011 (Colour)	The site remains largely unchanged with small trees and shrubs regrowing along the southern boundary. Additional construction materials appear to be stored on the asphalt path that runs parallel to the western boundary. The carpark directly to the west of the site appears to be used for construction materials storage. The Delta E.M.D. plant to the north has been partly demolished. The former Tourle Street steel lattice bridge has been demolished, and further development continues within Steel River Industrial Estate.
October 2016 (Colour)	The site remains largely unchanged with the exception of absence of identifiable stockpiles and increase in vegetation. There is a boom gate across the access road off McIntosh Drive. There are no apparent changes at the former Delta E.M.D., although it is understood a recycling facility has begun operations at the property. Construction of a second concrete girder bridge off Tourle Street has commenced and there has been capping / hardstand construction undertaken to the immediate east of the site across Tourle Street. The rest of the surrounding area remains largely unchanged.

June 2022 (Colour)	The site remains mostly unchanged, with the exception of increased vegetation and the apparent storage of construction materials / soil stockpiles along the northern boundary and a cycle path connecting McIntosh Drive to Tourle Street has been constructed (between August and December 2017). The existing data centre has been built (between November 2019 and March 2021) on the former carpark directly west of the site, and a concrete production facility has been established (after March 2021) directly to the south of the site. Further development continues within the Steel River Industrial Estate and the <i>Benedicts</i> recycling facility (established in 2018) appears to be in full operation directly north of the site (former Delta E.M.D. site) and there appears to be a similar facility to the east of the site across Tourle Street. The second span of Tourle Street bridge has been completed.
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Reviewed documentation is included in **Appendix B**.

There are nine (9) years of imagery available in the Google *StreetView* from McIntosh Drive and / or Tourle Street:

- January 2008: The site appears to be used to store construction materials potentially from adjacent projects, however, the image is blurred and unclear. The Delta E.M.D. plant is still in operation and can be seen in the distance. There is an access drive to the site from Tourle Street.
- January 2010: A black steel fence has been installed along the western and inside the boundaries, and some vegetation in the southwestern corner appears to have been removed. The Delta E.M.D. plant has ceased operations. Small stockpiles of soil are visible near the asphalt along the northern boundary of the site, vegetation in the southeastern corner has also been partially cleared and the marker for a high-pressure gas line is visible adjacent Tourle Street.
- June 2015: The access road along the western boundary of the site, which previously led to the Delta E.M.D. plant, has been restricted. Vegetation has regrown over a significant portion of the site and has made the access off Tourle Street impassable.
- August 2017 (available from Tourle Street only): The vegetation on the site is significant and road works are underway along the eastern boundary.
- April 2018 (available from Tourle Street only): Vegetation has been cleared along the southern boundary of the site and a cycle path connecting Tourle Street and McIntosh Drive has been built. There is no vehicle access to the site from Tourle Street.
- August 2019 (available from Tourle Street only): Construction of high voltage transmission cables running along the southern boundary of the site are underway.
- October 2020: Vegetation has taken over majority of the site; the southern boundary is grassed, and a further barrier has been installed at the site boundary. The recycling facility to the north is in operation and the data centre to the west of the site is under construction.
- March 2021 (available from Tourle Street only): The site appears to be unchanged. The concrete plant to the immediate south of the site is under construction.
- September 2024: The site appears to be unchanged. The data centre is completed and the Hymix concrete plant is in, or close to operation.

These images are included in **Appendix B**.

3.4 CONTAMINATED LAND PUBLIC RECORD

RCA undertook a search of the NSW EPA public lands register⁶ administered under the POEO Act and found no records of Environment Protection licences, applications, notices, audits or pollution studies and reduction programmes applicable to the site. BHP Billiton Ltd was previously licensed for waste facilities (environmentally sensitive landfilling, CWR or slag landfilling) at the 'Steel River Project'; the license No. 6436 was surrendered on the 9th of August 2001, presumably after the completion of the remediation works. Monitoring obligations were limited to air quality monitoring only.

A search of the wider area of the Mayfield suburbs showed fifteen (15) facilities with an active EPL and six (6) surrendered. A summary of the facilities is shown below in **Figure 3**.

RCA undertook a search of land parcels notified⁷ to the NSW EPA as potentially requiring regulation (as updated 10 February 2025) and confirmed that the site is not notified. However, there are seven (7) parcels that are currently notified for Mayfield West and Mayfield North. A summary of the facilities is shown below in **Table 5**: a further seven (7) parcels are notified within Mayfield, the majority were >1 km from the site and are therefore not presented below.

⁶ <http://www.epa.nsw.gov.au/publicregister/>

⁷ <http://www.epa.nsw.gov.au/clm/publiclist.htm>

Table 4 *NSW EPA public lands register*

Facility and Address	EPL Status, Number and Purpose	Monitoring Requirements	Distance From Site Perceived Risk of Contamination to Site
Benedict Recycling Pty Ltd 1A McIntosh Drive, Mayfield West.	Active 20771: Licenced for general waste, contaminated soil treatment and waste storage	Surface water and noise.	This facility is situated directly to the north of the site. Low
Aero Logistics Pty Ltd 10 Laurio Place, Mayfield West	Active 12192: Licensed for helicopter related activities	Nil	400 m NW Low
Bulbeck Enviro Pty Ltd 4 Channel Road, Mayfield West	Active 13206: Licensed for waste processing (non-thermal treatment) and waste storage	Nil	700 m W Low
Commonwealth Steel Company Pty Ltd 2 Maud Street Mayfield West	Active 822: Licensed for metallurgical activities Active	Air (emissions monitoring), water (effluent monitoring) and applications to land	800 m S Low
Austube Mills Pty Ltd 51 Industrial Drive, Mayfield North	Active 12665: Licensed for metallurgical activities	Nil	1.2 km E Low
Commonwealth Steel Company Pty Ltd George Bishop Drive, Mayfield North	Active 13214: Licensed for metallurgical activities	Nil	2 km E Low
Infrabuild Wire Pty Ltd Ingall Street, Mayfield North	Active 11149: Licensed for metallurgical activities	Air (emissions monitoring), water (effluent monitoring) and ground water (quality monitoring)	1.8 km SE Low
Koppers Carbon Materials & Chemicals Pty Ltd 133 Woodstock Street, Mayfield North	Active 2156: Licensed for chemical production and storage and shipping in bulk	Air (emissions monitoring)	500 m SE Low
Mayfield Industrial Estate Assoc. Inc. Selwyn Street, Mayfield East	Active 11549: Licensed for miscellaneous discharge to waters	Biological compounds and water quality monitoring	2.4 km SE Low

Facility and Address	EPL Status, Number and Purpose	Monitoring Requirements	Distance From Site Perceived Risk of Contamination to Site
Newcastle Recycling Solutions Pty Ltd 151 Ingall Street, Mayfield	Active 12764: Licensed for resource recovery and waste storage	Nil	900 m NE Low
One Rail Australia (FLA) Pty Ltd Mayfield West	Active 21368: Licensed for railway activities	Nil	1.3 km SW Low
Port of Newcastle Operations Pty Ltd Mayfield No. 4 Berth, off Selwyn Street, Mayfield North	Active 13181: Licensed for shipping in bulk	Water quality discharge and weather	3.4 km SE Low
Stolthaven Australia Pty Ltd 103 Selwyn Street, Mayfield North	Active 20193: Licensed for chemical storage and shipping in bulk	Air and water (surface and groundwater) quality monitoring	2 km ESE Low
Suez Water Pty Ltd 15-19, Channel Road, Mayfield West	Active 20757: Licensed for miscellaneous discharge to waters	Water quality discharge	950 m W Low
Hymix Australia Pty Ltd Corner Tourle Street & Industrial Drive, Mayfield	Active 1079493: Licensed for concrete works	Nil	This facility is situated directly to the south of the site. Low
BHP Billiton Ltd Industrial Drive, Mayfield	Surrendered 1708: Licensed for cement or lime works, contaminated soil treatment and miscellaneous water activities	Water (effluent) quality discharge	1.8 km SE Low
Boral Resources (NSW) Pty Ltd Industrial Drive, Mayfield	Surrendered 1134: Licensed for crushing, grinding or separating works	Nil	500 m WSW Low
Delta E.M.D. Australia Pty Ltd 80 Tourle Street, Mayfield	Surrendered 3278: Licensed for crushing, grinding or separating and chemical production	Air and water (effluent) discharge quality	This facility was situated directly to the north of the site Low
Onesteel Trading Pty Ltd 51 Industrial Drive, Mayfield	Surrendered 1763: Licensed for mineral or metallurgical processing and waste activities	Water quality (effluent) and discharge (volume)	1.1 km SE Low

Facility and Address	EPL Status, Number and Purpose	Monitoring Requirements	Distance From Site Perceived Risk of Contamination to Site
Stolthaven Australia Pty Ltd Mayfield No. 7 Berth, Mayfield North	Surrendered 20716: Licensed for extractive activities	Water quality monitoring	2 km ESE Low
Veolia Recycling & Recovery Pty Ltd Units 2 & 4, Woodstock Street, Mayfield North	Surrendered 20881: Licensed for resource recovery and waste storage	Nil	400 m SE Low

Table 5 Land parcels notified to the NSW EPA potentially requiring regulation

Location	Address	Distance From Site	Regulation	Perceived Risk of Contamination to Site
Stevenson Park Landfill	2/559 Maitland Road, Mayfield West	800 m WSW	Nil	Low; in the absence of regulation by the NSW EPA it is not considered that there is potential for off-site contamination which may impact at the site.
Koppers Coal Tar	East of Woodstock Street and Tourle Street, Mayfield North	500 m SE	POEO Act	Low; due to RCA's understanding of groundwater flow being to the north / north-east and the facility's location with relation to the site, it is not considered likely that any contamination would impact the site.
Tourle Street Bridge Project	Tourle Street, Mayfield West	300 m N	Nil	Low; in the absence of regulation by the NSW EPA it is not considered that there is potential for off-site contamination which may impact at the site.
BHP Steel River	'The Buffer Zone' extending directly adjacent to the Hunter River	300 m N	NSW EPA	Low; regulation by the NSW EPA implies that there is potential for off-site contamination, however, due to RCA's understanding of surface water and groundwater flow, it is not considered likely that any contamination would impact the site.
OneSteel (BHPB)	Industrial Drive, Mayfield	900 m E	NSW EPA	Low; regulation by the NSW EPA implies that there is potential for off-site contamination, however based on the facility's distance from the site, it is not considered likely that any contamination would impact the site.
BHP Closure site and bed sediments of the Hunter River	Bound by the Hunter River, Selwyn Street & Industrial Drive	2.3 km SE & 300 m N	CLM Act	Low; regulation by the NSW EPA implies that there is potential for off-site contamination, however, due to the facility's distance from the site and the absence of any connection to the Hunter River, it is not considered likely that any contamination would impact the site.
OneSteel – Newcastle Wire, Rod and Bar Mills	141 & 151 Ingall Street, Mayfield North	1.9 km ESE	Under assessment by the NSW EPA	Low; due to the facility's distance from the site it is not considered likely that any off-site contamination would impact the site.

Location	Address	Distance From Site	Regulation	Perceived Risk of Contamination to Site
Former BHPB supply site	Industrial Drive, Mayfield North	500 m SE	CLM Act	Low; regulation by the NSW EPA implies that there is potential for off-site contamination, however due to the facility's distance from the site, it is not considered likely.
Swing Basin allotment on former Onesteel site	151B Ingall Street, Mayfield North	1.2 km ENE	Under assessment by the NSW EPA	Low; due to the facility's distance from the site it is not considered likely that any off-site contamination would impact the site.

RCA undertook a search of the NSW EPA gasworks database⁸ and determined that there are five (5) former gasworks sites within the Newcastle City Council region. The closest is situated at the intersection of Ellis Road, Turton Road and Georgetown Road, Waratah, approximately 2.5 km south of the site, and as such is not considered likely to pose a risk of contamination.

RCA undertook a search of the NSW Department of Primary Industries register⁹ for cattle dip sites and determined that there are no known cattle dip sites within the Newcastle City Council area.

RCA undertook a search of the NSW Office of Fair-Trading asbestos insulation register¹⁰ and determined the absence of loose-fill asbestos insulation in the buildings at the site.

RCA undertook a search of the Department of Defence register for unexploded ordnance (UXO)¹¹ and determined that there is no known unexploded ordnance on site or within vicinity of the site.

RCA undertook a search of the Department of Industry mapping of naturally occurring asbestos¹² and determined that there are no known point occurrences or geological units with medium to high asbestos potential.

3.5 PFAS INVESTIGATION AND MANAGEMENT

RCA undertook a search of the NSW EPA register for sites under investigation regarding per and poly fluoroalkyl substances (PFAS)¹³ which indicated that there are no known PFAS investigations on site or within vicinity of the site. The closest known area of PFAS contamination is approximately 2.9 km to the south of the site.

RCA reviewed Appendix B of the PFAS National Environmental Management Plan 2.0¹⁴ and identified no historical or current activities associated with point sources of PFAS contamination.

RCA undertook a search of the Defence PFAS Investigation and Management Program¹⁵ and Defence 3 Year Regional Contamination Investigation Program¹⁶ and there are no Defence sites where PFAS contamination is being investigated and managed within the site or vicinity of the site.

RCA undertook a search of Airservices Australia National PFAS Management Program¹⁷ and there are no locations that are subject to ongoing investigation by Airservices within the site or vicinity of the site.

Based on the above, it is considered the potential for PFAS to be present on-site is low.

⁸ <http://www.epa.nsw.gov.au/clm/gasworkslocation.htm>

⁹ www.dpi.nsw.gov.au/animals-and-livestock/beef-cattle/health-and-disease/parasitic-and-protozoal-diseases/ticks/cattle-dip-site-locator

¹⁰ www.fairtrading.nsw.gov.au/loose-fill-asbestos-insulation-register

¹¹ <https://uxo-map.defence.gov.au/>

¹² trade.maps.arcgis.com/apps/PublicInformation/index.html?appid=87434b6ec7dd4aba8cb664d8e646fb06

¹³ www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program

¹⁴ <https://www.dcceew.gov.au/sites/default/files/documents/pfas-nemp-2.pdf>

¹⁵ <https://www.defence.gov.au/about/locations-property/pfas/pfas-management-sites>

¹⁶ <https://www.defence.gov.au/about/locations-property/regional-contamination-investigation-program>

¹⁷ <https://engage.airservicesaustralia.com/national-pfas-program>

3.6 GEOLOGY AND HYDROGEOLOGY

RCA reviewed published geological and hydrogeological maps and summarised the findings in **Table 6**.

Table 6 *Geology and Hydrogeology*

Soil type	The Newcastle Soil Landscape map (Ref [15]) indicates that the site comprises two (2) landscapes: - Disturbed terrain. Based on the validation report and assessment reports as detailed in Section 3.1, the fill comprises waste materials, slag and CWR. - Beresfield Soil Landscape. This comprises friable brownish black loam, hard-setting dull yellowish brown sandy loam, brown plastic mottled clay, reddish brown plastic pedal clay and gleyed “puggy” silty clay. . The geological profile of the site is described in the Newcastle 1:250,000 geological sheet (Ref [16]) as being within Quaternary period gravel, sand, silt, clay “Waterloo Rock”, marine and freshwater deposits. The site is mapped as being immediately north of Permian era Tomago Coal Measures and consists of shale, mudstone, sandstone, tuff and coal.
Acid sulfate soil	The Wallsend Acid Sulfate risk map indicates that the site is situated an area of no known occurrence of acid sulfate soil materials and disturbed terrain. LEP mapping (Ref [8]) shows the disturbed terrain as Class 2 and the no known occurrence as Class 5. It is noted that the mapping, undertaken in 1997, indicate that the elevation of the disturbed terrain in 1-2 m AHD which is not considered to be representative of the current elevation.
Groundwater use	There is no known groundwater use on site. There are three (3) registered groundwater wells within 500 m of the site: - GW201306 is situated approximately 100m to the west of the site and is registered for monitoring use. The well was drilled to 21.0 mbgs and the drillers’ logs outlined the presence of fill to 14 mbgs overlying estuarine sediments. - GW201307 is situated approximately 200 m to the south of the site and is registered for monitoring use. The well was drilled to 20.15 mbgs and the drillers’ logs outlined the presence of fill to 2.0 mbgs overlying shale to 3.2 mbgs overlying sandstone to 12.05 mbgs overlying coal to 13.05 mbgs overlying sandstone / siltstone. - GW203045 is situated approximately 400 m to the east southeast of the site and is registered for environmental rehabilitation. Based on the records, this location was not completed as a well, rather was backfilled at the time of drilling. The drillers’ logs outlined the presence of fill to that depth; a strong PAH odour and the presence of phase separated hydrocarbons was noted.
Number of monitoring wells on site	There are no registered groundwater wells on site however, BHW2/1 (Ref [10]) is situated in the northeastern corner of the site.
Depth to groundwater	The depth to groundwater at the site has previously been identified as approximately 7 – 8 mbgs. BHW2/1 was measured using a dip meter on 14/1/25 and the depth of groundwater was found to be 8.3 mbgs and the total depth of the well was 15.31 mbgs.
Estimated Groundwater flow direction	Groundwater flow direction is unknown, but it is presumed to flow in a general northerly direction towards the Hunter River.
Background water quality	Groundwater is expected to be contaminated as determined during the historical assessments of the Steel River Estate.

The groundwater information is attached in **Appendix C**. It is noted that there is likely to be other unregistered groundwater wells from the historical contamination assessments present in the local area.

3.7 INTEGRITY ASSESSMENT

Information obtained relating to previous assessments of the site is presumed to be accurate and representative. It is noted that the validation report (Ref [10]) does not provide site specific data; however, it has been used to provide a summary of the history of the Steel River Industrial Estate and the potential contamination associated with the area.

Information obtained from aerial photography is limited in that it only provides a snapshot of the site in time. RCA considers that adequate coverage was achieved for this investigation with aeriels available for each decade from the 1940s onwards.

Information regarding groundwater use is subject to the third parties and may not be up to date; further there are apparent gaps as the groundwater wells referred to in the validation report (Ref [10]) are not registered. However, for the purpose of this report, it is considered that the information obtained from WaterNSW is adequate and representative.

Information obtained from publicly accessible registers and websites are presumed to be accurate however is subject to third parties and may not be up to date.

Overall RCA considers that the site history review is adequate to provide a general understanding of the past nature of land use at the site.

4 PRELIMINARY CONCEPTUAL SITE MODEL

RCA has determined, based on the reviewed historical information, that the site was mostly formed by the filling of the Platts Channel waterway and associated low-lying lands from sometime between 1954 and 1966; the southern portion of the site is considered to have a lesser extent of fill as its original topography comprised residual geology however there is no information available to quantify. The fill comprised a heterogeneous mix of waste products from the BHPB steelworks operations such that contamination, particularly PAH compounds, are known to be present.

The majority of the site was used as a hardstand for equipment storage up until the closure of the steelworks. The northern boundary comprised a road which linked the main steelworks facility to its operations to the west of Tourle Street. Subsequent to the closure of the steelworks, remediation by capping was undertaken ostensibly with 2 m of CWR although, based on RCA's experience at the Estate, it is noted that there are generally other materials within the capping layer. It is further noted, based on RCA's experience at the Estate, that pre-existing fill where no contamination was identified during the historical investigations may have also been incorporated into the definition of the capping layer. Since the completion of remediation there has been no formalised use of the site; storage / illegal placement of soil and building products was evident and an 11kV low voltage cable high voltage power line was installed below the surface along the southern boundary.

The area around the site, with the exception of the elevated area to the south, has similarly been subject to filling and remediation such that it is considered to have the same contamination characteristics. There are numerous land parcels in the area with operational or surrendered licences with the NSW EPA for polluting activities and numerous land parcels which have been notified to the NSW EPA as potentially contaminated such as to require regulation under the CML Act. While none are considered likely to directly impact at the site, these are considered to be representative of the potential for contamination to be present.

Based on RCA's understanding of the site, the potential contamination, exposure pathways, and receptors are considered as follows:

- Historical filling of the site:
 - Material situated at depths of 2 mbgs and deeper are expected to be contaminated and pose a risk to human health and the environment when encountered such that specific consideration and management is required. Soils shallower than this are not expected to be contaminated, however there is the possibility of localised contamination to be present which will need management.
- Site activities since the completion of the remediation:
 - The fate and contamination status of stockpiles identified at the site, and to the west within the Lot after the completion of the remedial works (refer **Section 3.1.4**), is unknown. It is considered possible that these remain within the site boundaries. RCA understands that the management protocols for stockpiles from nearby construction works should have ensured that only capping materials or surplus imported construction materials were placed on the site however the possibility that the stockpiles comprised material from below the capping layer or other wastes cannot be discounted based on the available information.

The Project will have concrete and other handstand and will have no permanent personnel at the site. The proposed maintenance structure and switch room are approximately 15 m and 7 m wide respectively and are therefore not considered to be subject to potential accumulation of vapours (if present within the site soils). As such it is considered that the primary risk associated with the site will be associated with the construction works which will require earthworks for site levels and foundations. The construction works will give rise to potential exposure to the contaminants by:

- Inhalation of vapours, if volatile contaminants are present in the soil.
- Inhalation of dust.
- Ingestion of dust and soil.
- Dermal contact with dust and soil.

No exposure to groundwater is considered feasible without active extraction; wet soil may be encountered in excavations greater than 5 m.

5 SAMPLING AND ANALYTICAL QUALITY PLAN

No formal sampling and analytical quality plan (SAQP) was developed for the Project, however **Table 7** provides detail and rationale regarding the scope of works undertaken.

Table 7 *Data Quality Objectives of the Site Investigation*

Data Quality Objective	Description
Step 1- State the Problem	The site was formerly contaminated by historical filling within industrial waste and by-products and has known PAH contamination as well as tar and oil residues. The site was capped with (primarily) CWR approximately 20-25 years ago and while it has not been formally used there is some uncertainty about whether stockpiles of soil of an unknown quality have been placed at the site. The site is proposed to be developed and as such the potential for contamination in the top 2 m is considered to require characterisation to inform construction management requirements.
Step 2- Identify the Goal and Decisions	The goal of the assessment was to adequately characterise the top 2 m of material at the site with regards to its suitability for the proposed use or otherwise identify that further assessment would be required. The specific decision(s) to be made to address the goal of the assessment are as follows: • Is there potential for contamination of the site from previous land use and/or adjoining uses? • Is there contamination present in the shallow soils of the area of proposed construction? • Are any contaminant concentrations at levels which would pose a constraint to the proposed development and / or require management during construction?
Step 3- Identify the Inputs to the decisions	The specific types of information needed to resolve the decision statement(s) in Step 2 are noted as follows • Site history information. • Sampling results. • Guidelines for assessing risk to human health and the environment from contaminated soil and/or water. • Best practise in alignment with SEPP55 (Ref [4]) prescribes assessment on the basis of the most sensitive allowable site use. Based on the site zoning and proposed use, RCA considers the human health criteria as defined (Ref [5]) for commercial / industrial land use is appropriate. Full details of the relevant guidelines are included in Appendix D.
Step 4- Define the Boundaries of the investigation	The horizontal extent of the assessment has been defined by the site boundary, as fenced or presumed by nearby features. The vertical extent was based on consideration of the conceptual site model and was to be defined by the interface of the capping material and underlying fill, anticipated to be approximately 2 mbgs noting that there was some uncertainty due to the uneven topography of the site. No assessment of groundwater was included in the scope of works however its depth was to be noted if encountered during intrusive works and if any of the historic groundwater wells could be identified. Practical constraints that could have interfered with sampling comprised underground services and restrictions on clearing vegetation at the site. No specific temporal constraints were identified. No specific financial constraints were identified, noting that any variations to costs identified to client were to be confirmed with client prior to additional cost being incurred.

Data Quality Objective	Description		
Step 5- Develop the Decision Rules	Accuracy	Internal – surrogates, laboratory control samples, matrix spikes, method blanks. External – interlaboratory duplicates.	Surrogate, LCS, spike recovery data to be 70-130%. Blanks results to be <practical quantification limit (PQL). Relative percentage difference (RPD) of duplicates to be: • 60% at concentration levels greater than ten times the PQL. • 85% at concentrations between five to ten times the PQL. • 100% at concentration levels between two and five times the PQL. Where concentration levels are less than two times the PQL, the Absolute Difference (AD) shall be calculated. Data will be considered acceptable if the AD <2.5 times the PQL
	Precision	Internal – laboratory duplicates External – intralaboratory duplicates.	RPD of duplicates to be: • 50% at concentration levels greater than ten times the PQL. • 75% at concentrations between five to ten times the PQL. • 100% at concentration levels between two and five times the PQL. Where concentration levels are less than two times the PQL, the Absolute Difference (AD) shall be calculated. Data will be considered acceptable if the AD <2.5 times the PQL.
	Completeness	The percentage of completed data points, taking in account consideration of other DQI.	95%
	Representativeness	Whether there has been sufficient sampling by appropriate methodology with relevant analysis to determine that the assessment is representative of the site conditions.	
	Comparability	• All samples collected during this sampling programme will be obtained by adequately trained RCA personnel using consistent sampling methodologies throughout the project. • All samples must be received by the laboratory cool and appropriately preserved for the requested analysis with sufficient time within the specified holding time. • All laboratory analyses will be conducted by NATA accredited methodologies that comply with the international standard methods. • Comparable analytes such as TRH C₆-C₁₀ and BTEXN, PAH and TRH >C₁₀-C₄₀, and metals should show some concurrence between analytical results and to identified field observations.	

Data Quality Objective	Description
Step 6- Acceptable Limits on Decision Rules	The following provides the basis of the data's useability assessment which is not in accordance with the DQI: • The result's closeness to the guideline concentrations. • Specific contaminant of concern (carcinogen, bioaccumulation potential, available exposure pathways). • The area of sample location(s) in question including the potential lateral and vertical extent of questionable information. • Whether the uncertainty can be effectively managed by site management controls.

The scope of work, **Section 6**, is considered to comprise Step 7 of the DQO.

6 FIELDWORK

Specific observations made by RCA personnel who attended the site on 12 December 2024 are listed in **Table 8**. The location of photographs taken during the site inspection are shown on **Drawing 1, Appendix A** and attached as **Appendix E**.

Table 8 *General Site Conditions and Observations*

Topography	The site is generally flat with a slight slope in the central area of the site that drains towards the northern boundary.
Site condition	The site is heavily vegetated with weeds, small shrubs, and some trees (primarily along the eastern boundary) with the exception of an asphalt hardstand and path over parts of the northern and eastern boundaries. A black steel fence runs around the southern and western perimeter of the site and parallel to the eastern boundary within the site; the northern boundary is heavily vegetated. An old disused electrical box was found in the northeastern corner of the site amongst the vegetation and concrete blocks, pipes and barriers are stored along the northern boundary along with orange PVC pipes. A groundwater monitoring well is located in the northeastern area of the site.
Condition of building and roads	There are no structures on the site and the asphalt roads and pathways appear to be in relatively good condition.
Visual signs of contamination	There were no visual indications of contamination observed prior to the commencement of intrusive works.
Signs of erosion	No visual signs of erosion were identified.
Presence of drums or waste	No evidence of drums and / or waste beyond the abovementioned storage of construction materials were identified.
Identification of potential asbestos containing materials (ACM)	No visual indications of materials suspected to contain asbestos were identified during the site inspection and as such no asbestos samples were collected.
Visible signs of plant stress	No indications of plant stress were identified.
Odours noticeable on site	No odours were noticeable on site prior to the commencement of intrusive works.
Evidence of current or former petroleum facilities	No indications of former petroleum facilities were identified prior to the commencement of intrusive works.
Chemicals stored on site	No indications of chemical storage were identified on site.
Evidence of waste burial: (anecdotal or otherwise)	No evidence of buried waste materials was observed prior to intrusive works, noting that it has been well established that there is buried waste at the site and within the Steel River Estate.

An environmental engineer experienced in the handling of potentially contaminated soil undertook the fieldwork on 13 and 14 January 2024 with the assistance of a subcontracted excavator. The scope of work included:

- The collection of thirty-three (33) soil samples from ten (10) test pit locations (TP1 – TP10) (as presented on **Drawing 1, Appendix A**) on the site:
 - This is not in accordance with the minimum twenty-five (25) sampling locations as recommended by NSW EPA guidelines (Ref [1]) for a site of 1.5 ha and has been reduced based on previous validation works and the understanding that contamination is present at depths greater than 2 mbgs.
 - The sampling locations were cleared of services prior to the commencement of fieldwork.
 - Samples were collected from encountered materials from the near surface, and at approximately 1.0 and 2.0 mbgs using an eight (8) tonne excavator. An additional sample was collected at TP4 due to changes in lithology and or olfactory indications of contamination.
 - Soil samples were collected directly from the bulk of the soil within the excavator bucket.
 - All soils samples were screened with a photoionisation detector (PID) to assess for the presence of volatile compounds.
- Re-instatement of all test pits by replacing the extracted soil back into the holes.
- Logging of test pits including description of samples for texture, colour, odour, moisture content. Logs are attached in **Appendix F**.
- The analysis of all collected soil samples for total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN), PAH and metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury).

Borehole locations from the concurrent geotechnical assessment, being reported separately, are also shown on **Drawing 1, Appendix A**.

The site was found to contain heterogeneous fill materials comprised predominantly of CWR silty sandy gravel with slag and building refuse at variable depths (0.1 to 2.0m) across the ten (10) sampling locations (refer to test pit logs in **Appendix F**). Slight hydrocarbon odours were identified at TP2, TP3 and TP4 along with minor (maximum 8.5ppm) PID readings, however, are not considered to represent the presence of significant contaminants.

Groundwater was not encountered other than what was considered to be perched groundwater at 0.75 mbgs at TP1.

No surface water drainage was observed by RCA.

7 QUALITY ASSURANCE/QUALITY CONTROL

RCA have assessed the data in accordance with the DQI as presented in Section 5 in **Appendix G** as follows:

- Accuracy
 - The accuracy of the data has been assessed by internal means (surrogates, laboratory control samples, matrix spikes and method blanks) as being acceptable. Only a few results were outside the acceptance criteria however none were considered to represent significant uncertainty in the results.
 - The accuracy of the data has been assessed by external means (interlaboratory duplicates) as being acceptable. There was some minor uncertainty with PAH results which has been accounted for by the use of the most conservative results in the site characterisation.
- Precision
 - The precision of the data has been assessed by internal means (duplicates) as being acceptable with the exception of PAH, copper and chromium in TP5A for which a triplicate indicated significant discrepancy with both the primary and duplicate samples. RCA have therefore utilised the triplicate results in the site characterisation.
 - The precision of the data has been assessed by external means (intralaboratory duplicates) as being generally acceptable. There was some minor uncertainty with some results which has been accounted for by the use of the most conservative results in the site characterisation.
- Completeness
 - All data that was sought during the investigation was able to be retrieved with the exception of three (3) samples that were broken in transit and unable to be recovered (TP2C, TP4D and TP9B). The absence of these samples is not considered to present significant uncertainty in the characterisation of the site based on:
 - TP2C was sampled from the same strata as TP2B such that it is considered the stratum has been characterised.
 - TP4D was sampled from a similar stratum (presumed capping layer) as TP4C (FILL (CWR) silty sandy gravel) such that it is considered the stratum has been characterised.
 - TP9B was sampled from strata between TP9A and TP9C. As the sample profile of TP9B (FILL: silty sandy gravel) is similar to TP9A and there is no contamination present in either sample TP9A or TP9B, and in the absence of field indications of contamination in the stratum of TP9B it is not considered that the uncertainty is significant.
 - Chain of custody were completed for all samples.

As such, completeness is considered acceptable for the purpose of this assessment.

- Representativeness
 - This assessment has considered soil contaminant concentrations on-site. The method of sampling presented a potential for loss of volatiles however in absence of olfactory or visual indications of this type of contamination it is not considered that the potential was significant, and the methodology permitted inspection of the soil strata. As such the soil data is considered representative of the concentrations at the site.
 - The laboratory noted the potential for under-representation for all samples with similar strata to TP1B. TP1B is described as (FIL (CWR)) comprising gravel and cobbles, a composition which is considered heterogeneous and present through the majority of the capping layer. RCA have therefore applied the same raised PQL to all samples for the purpose of characterisation.
- Comparability
 - Works were undertaken by personnel experienced in the sampling of potentially contaminated soil.
 - All samples were appropriately preserved for the requested analysis and were kept on ice or in the refrigerator between sampling and analysis.
 - All laboratory analyses have been conducted by NATA accredited methodologies that comply with the international standard methods.
 - Comparable analytes such as TRH C₆-C₁₀ and BTEX shown some concurrence between analytical results. The detected concentrations show some concurrence with field observations of the presence of contamination.

As such it is considered that the comparability of the data is appropriate.

It is therefore considered that the data obtained from this testing is accurate and reliable in as far as it can be ascertained and is acceptable for the purpose of site assessment.

8 RESULTS

All soil results are compared to the relevant criteria in **Appendix H**. In summary:

- BTEX concentrations were not detected in any of the samples and all concentrations are below the relevant criteria (Ref [5] and [6]).
- TRH concentrations were not detected or were detected at low concentrations below the relevant criteria (Ref [5] and [6]) with the exception of:
 - Samples TP2B and TP10A for which TRH > C₁₀-C₁₆ concentrations were in excess of the relevant ecological guideline.
- PAH concentrations were not detected or were detected at low concentrations below the relevant criteria (Ref [5]) with the exception of:
 - Samples TP4B, TP5A, TP5B and TP6C for which benzo(a)pyrene concentrations were in excess of the relevant ecological guideline.
- Metals concentrations were either not detected or detected below the relevant guidelines (Ref [5]) with the exception of the following in excess of the relevant ecological guideline:
 - Samples TP1B, TP2B and TP4B for chromium concentrations.

- Sample TP7A for nickel concentrations.
- Asbestos was not detected.

Soil results in excess of the relevant ecological criteria are presented in **Table 9**.

Table 9 *Soil Results above Relevant Ecological Criteria*

Sample Identification (depth)	Analyte	Criteria (Ref [5])	Concentration
TP1B (1.0m)	Chromium	310	520
TP2B (1.0m)	TRH >C ₁₀ -C ₁₆	170	270
	Chromium	310	760
TP4B (1.0m)	Benzo(a)pyrene	1.4	5.6
	Chromium	310	420
TP5B (1.0m)	Benzo(a)pyrene	1.4	2.4
TP6C (2.0m)	Benzo(a)pyrene	1.4	2
TP7A (0.1m)	Nickel	55	62
TP10A (0.1m)	TRH >C ₁₀ -C ₁₆	170	180

All concentrations in mg/kg.

Ecological Criteria for Commercial and Industrial land use (Ref [5]).

Results have been compared to the waste guidelines (Ref [17]) in **Appendix H** and indicate a differential classification from general solid waste to hazardous waste when compared to Tier 1 criteria. All results indicate the potential to meet the Tier 2 criteria for general solid waste if leachate testing undertaken in accordance with the requirements of the guidelines return results below the Tier 2a criteria.

9 SITE CONTAMINATION CHARACTERISATION

The desktop assessment has identified that the site was that the majority of the site was historically filled with a heterogeneous mix of waste products from the BHPB steelworks from sometime between 1954 and 1966, and used as a hardstand for equipment storage up until the closure of the steelworks (late 1990s). Historical assessment identified contamination, particularly PAH compounds along with tar and oil residues, and remediation was undertaken by the placement of a 2m layer of CWR and other on-site materials such that the site was considered suitable for commercial / industrial land use. There has been no further formalised use of the site however there may have been some illegal placement of soil and building products such that there is contamination present in shallow soils.

Thirty (30) samples were collected from ten (10) locations to characterise the potential of contamination within the capping layer only. This number is below with the minimum twenty-five (25) sampling locations recommended by the NSW EPA guidelines (Ref [1]) for a site of 1.5ha and was reduced based on the previously validated (Ref [10]) character of the capping layer and the nature of the development which does not include any permanent personnel. No assessment of the underlying material was undertaken as there was considered to be sufficient understanding of the contaminated status of the material.

No visual indications of contamination were identified at the site during the works; there was some waste materials which were considered to be inert and not to pose a risk of contamination. Slight olfactory indications of hydrocarbon contamination were identified in the northern portion of the site during the excavation works.

No contaminant concentrations were identified in the capping layer samples in excess of human health criteria for commercial / industrial land use (Ref [5] and [6]). Concentrations of hydrocarbons, chromium and nickel were found in excess of the ecological criteria (Ref [5]) however based on the understanding that the site will have limited landscaping and the Project will reduce the overall permeability of the site by the addition of concrete slabs which prevent rainfall infiltration it is not considered that there will be any ecological populations at risk from the identified contamination.

RCA therefore considered that the site is suitable for the proposed use without any further assessment or remediation however will be subject to the implementation of a site management plan (SMP) which details the day-to-day requirements for construction work undertaken at the site and includes:

- Training to ensure that all workers undertaking excavation works are aware of the potential for unexpected contamination to be present in the capping layer and the likely presence of contamination at depths beyond 2 mbgs, including free tar and slag.
- Minimisation of potential exposure by dust minimisation and implementation of occupational hygiene controls to prevent dermal contact and incidental ingestion of soil adhered to skin.
- Stockpiling controls to ensure that no contamination migrates beyond the site boundaries due to dust or erosion.
- Requirements for return of soils excavated from below the capping layer or otherwise appropriate sampling (Ref [1]) and analysis (hydrocarbons and metals) to enable consideration of appropriateness (Ref [5] and [6]) to remain at the site or waste classification (Ref [17]).

The preparation of the SMP will be a requirement for the development in accordance with the Steel River Certification Process.

Any soil being removed from site will require classification in accordance with the NSW EPA guidelines (Ref [1] and [17]) prior to removal from the site. Current testing indicates that the materials will likely be able to be classified as general solid waste and disposed of accordingly to a licensed waste (disposal or recycling) facility. No testing of the soils beneath the capping layer has been undertaken and it would be expected that these soils would have higher levels of contamination than the capping layer materials. As such it is recommended that all excavated soils be differentially stockpiled to facilitate classification.

It is not considered that any material can be classified as excavated natural material (ENM) in accordance with the NSW EPA resource recovery order (Ref [18]), regardless of contamination status, as the majority of material is a processed product and therefore precluded from being classified as ENM.

All material removed from site must be tracked to demonstrate that it has been suitably managed, transported and placed in accordance with the requirements of the NSW waste legislation. Documents to be maintained comprise:

- Load sheets – truck registration being loaded, time loaded, approximate quantity, description of material being loaded, details of person doing the recording.
- Dockets from a licensed waste facility.
- Truck dockets as maintained by the driver transporting the loads.

These records should be kept in readiness for provision to a regulatory authority upon request.

10 CONCLUSIONS

This report has presented the findings of a detailed site (contamination) assessment undertaken at part 1 McIntosh (Lot 16 DP 270249) as part of the investigative process for the construction of a BESS at the site. A geotechnical investigation was undertaken concurrently and is reported separately.

The site historically was situated in a waterway known as Platts Channel and it, along with the majority of the Steel River Estate, was progressively filled with materials including wastes and by-products associated with the BHPB steelworks from approximately 1954 until prior to 1966. The site was used as an equipment storage hardstand and trafficable access road until the closure of the steelworks in the late 1990s and was then remediated by the placement of a capping layer comprising approximately 2m of CWR and other site materials. Validation of the remedial works was undertaken in 2004 (Ref [10]) and there has been no formalised use of the site since, although construction materials have been stored at the site and soil stockpiles have also been observed.

There are numerous facilities in the vicinity which are either licensed (or have been) by the NSW EPA for polluting activities or have been notified to the NSW EPA due to the presence of contamination however these are considered to be representative of the potential for contamination in the area rather than considered to pose a direct risk of contamination at the site.

RCA considered that the potential for contamination was associated with historical filling and the potential for contaminated materials to have been placed at the site since the completion of remedial works.

Slight hydrocarbon odours only were identified in the northern portion of the site and samples collected from depths which should be representative of material above and within the remedial capping layer did not indicate the presence of any hydrocarbon or metals contamination in excess of human health guidelines for commercial / industrial use.

Concentrations of hydrocarbons, chromium and nickel were identified at seven (7) locations in excess of the ecological criteria for commercial / industrial land use however in the absence of any identifiable potential for ecological populations as part of the proposed development, it is not considered that there are any limitations to the development.

As such, RCA considers that the site is suitable for the proposed development without further assessment or remediation however notes that management will be required to ensure that workers are informed of the contamination status of the material below the capping layer and have the right procedures and protocols to minimise the potential exposure to themselves and the environment during any excavation of materials below the capping layer. The Steel River certification process, regulated by City of Newcastle council, includes a SMP which is considered to be the appropriate documentation for management purpose.

All material which is removed from site must be sampled, classified, transported and tracked in accordance with the NSW EPA waste framework. Current testing provides a differential preliminary classification of the capping layer however there has been insufficient sampling to provide full classification. RCA recommends differential stockpiling of capping materials to any underlying materials prior to classification being undertaken.

No groundwater extraction is to be undertaken without any assessment into the suitability for the proposed purpose and the requirement for management controls to minimise exposure.

Yours faithfully

RCA AUSTRALIA



Stephen Hendriksen
Environmental Engineer
BEng(Env)



Fiona Brooker
Manager of Environmental Services
BEng(Env)

LIMITATIONS

This report has been prepared for Ausgrid in accordance with an agreement with RCA Australia (RCA) dated 2 December 2024. The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Ausgrid. The report may not contain sufficient information for purposes of other uses or for parties other than Ausgrid. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

REFERENCES

- [1] NSW EPA, *Contaminated Land Guidelines: Sampling Design Part 1 – Application*, August 2022.
- [2] NSW EPA, *Guidelines for Consultants Reporting on Contaminated Sites*, April 2020.
- [3] NSW EPA, *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, October 2017.
- [4] State Environmental Planning Policy (Resilience and Hazards) 2021.
- [5] NEPC, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 as amended 2013.
- [6] CRC Care, *Technical Report 10, Health screening levels for petroleum in soil and groundwater*, September 2011.
- [7] Standards Australia, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, AS 4482.1-2005.
- [8] NSW Planning Portal - Spatial Viewer: <https://www.planningportal.nsw.gov.au/spatialviewerhistoric/#/find-a-property/1McIntoshDriveMayfieldWest2304>

- [9] Bonhomme Craib & Associates and Sue Rosen PTY Ltd, *Report: An Assessment of the Historical and Archaeological Values of BHP Land at Tourle St., Newcastle*, February 1996.
- [10] URS Australia Pty Ltd, *Report: Remediation Validation, Steel River Site*, Ref:39933-020 final report Nov04.Doc, 30 November 2004.
- [11] Woodward-Clyde, *Steel River Project – Remedial Action Plan Environmental Impact Statement*, May 1997.
- [12] Maunsell Australia Pty Ltd, *Report: Geotechnical and Environmental Investigation*, Ref:2001206 final report Geotechnical and Environmental Investigation.doc, 21 September 2006.
- [13] RCA Lot 223, *Lot 223 West Mayfield, Environmental Management Plan, Former BHP Steelworks*, February 2006
- [14] Coffey Geotechnics Pty Ltd, *Report: Proposed Substation, Lot 16 DP270249 McIntosh Drive, Steel River Estate, Mayfield West, Stockpile Assessment*, GEOTSGTE20174AA-AE, 27 August 2007.
- [15] L.E. Matthei, Department of Land and Water Conservation, *Soil Landscapes of Newcastle 1:100000 Sheet*, 1995.
- [16] Geological Survey of New South Wales, *Department of Industry Resources & Energy, Newcastle Geological Sheet: 1:250,000*.
- [17] NSW EPA, *Waste Classification Guidelines, Part 1; Classifying Waste*, November 2014.
- [18] Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014.

GLOSSARY

95%UCL _{ave}	A statistical calculation – 95% Upper Confidence Limit of the arithmetic mean of the data set.
AHD	Australian height datum, based on a mean sea level.
ANZECC	Australian and New Zealand Environmental Conservation Council.
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure.
EIL	Ecological investigation level. Relates to soil concentrations which may pose a risk to ecological health.
EMP	Environmental management plan.
ESL	Ecological screening level. Relates to vapour risk from petroleum hydrocarbons which may pose a risk to ecological health.
HIL	Health investigation level. Relates to soil concentrations which may pose a risk to human health in soil.
HSL	Health screening level. Relates to the vapour risk from petroleum hydrocarbons which may pose a risk to human health in soil.
In-Situ	In place, without excavation.
Interlaboratory	A sample sent to two different laboratories for comparative analysis.

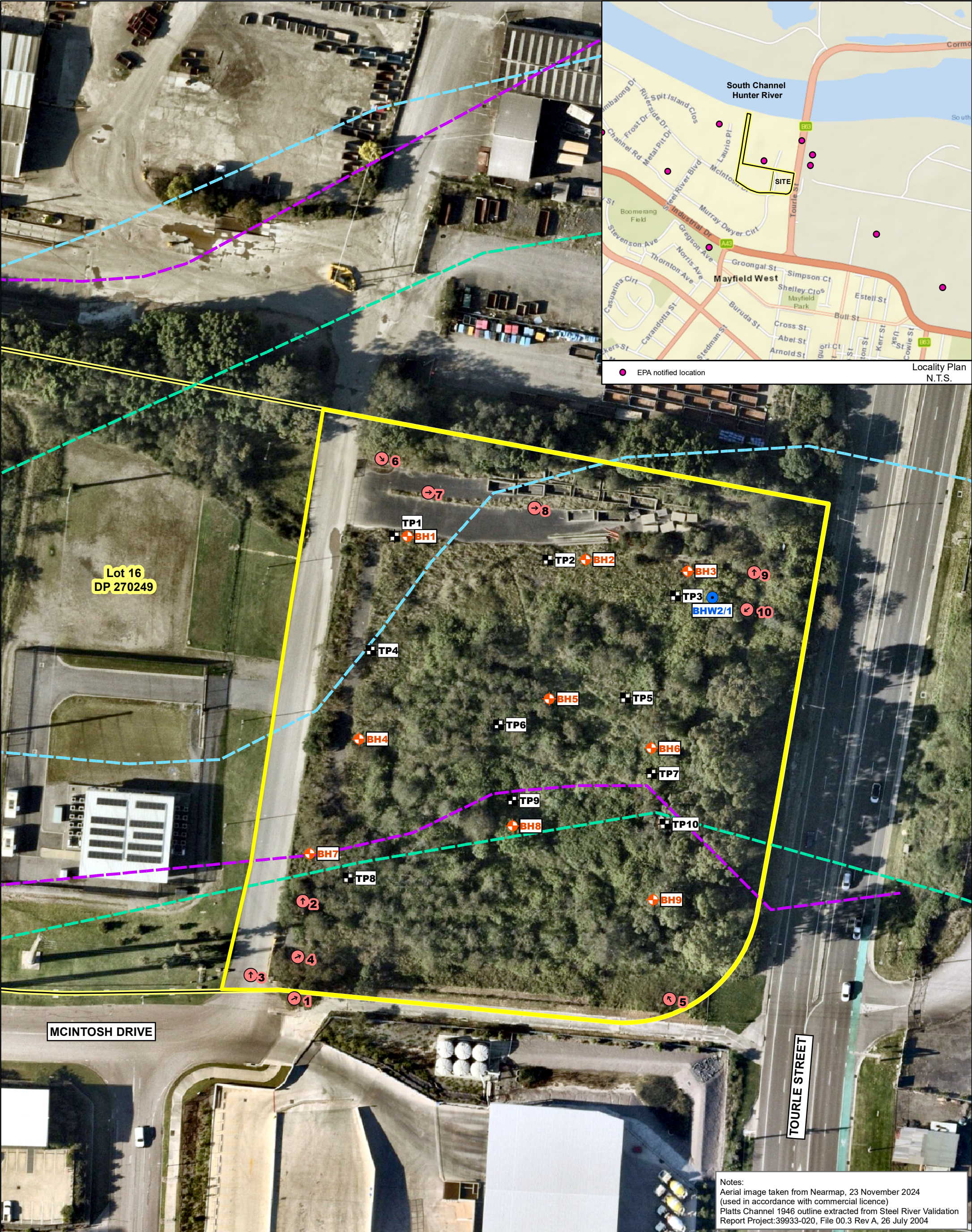
Intralaboratory	A sample split into two and sent blind to the sample laboratory for comparative analysis.
ISL	Investigation screening levels for soil. Comprised of HIL / EIL and HSL / ESL
kg	kilogram, 1000 gram.
LEP	Local environment plan. A planning tool for the Local Government.
µg	microgram, 1/1000 milligram.
mg	milligram, 1/1000 gram.
NAPL	Non-aqueous phase liquid. This can be lighter than water (LNAPL), or more dense than water (DNAPL).
NEPC	National Environment Protection Council.
NSW EPA	NSW Environment Protection Authority – made a separate entity in 2011 to regulate the contaminated land industry.
PID	Photoionisation detector. Measures volatile gases in air or emanating from soil or water.
PQL	Practical Quantitation Limit.
QA	Quality Assurance.
QC	Quality Control.
RPD	Relative Percentage Difference.

Chemical Compounds

BTEXN	Benzene, toluene, ethylbenzene, xylene, naphthalene. Straight chain hydrocarbons which are volatile. Occur naturally in crude oil, gas emissions from volcanoes and forest fires. Present in emissions from motor vehicles and aircrafts, cigarette smoke, processing of petroleum products, and during the production of numerous goods.
PAH	Polycyclic aromatic hydrocarbons. Multi-ring compounds, persistent and carcinogenic found in fuels, oils and creosote. These are also common combustion products.
TRH / TPH	Total recoverable / petroleum hydrocarbons. Mixture of (typically) straight chain chemicals mainly comprising hydrocarbon and carbons found in compounds sourced from crude oil. Fractions are based on behaviour in soil / water and contain many individual chemicals.

Appendix A

Drawing



LEGEND

- Lot boundary
- Approximate site boundary
- Contamination test pit location
- Geotechnical borehole location
- Approximate photograph location and direction
- Historical groundwater well location
- Mapped location of Platts Channel (1946 soundings drawing)
- Mapped location of Platts Channel (1954 aerial photograph)
- Mapped location of Platts Channel (1944 aerial photograph)

0 3.5 7 14 21 28 metres

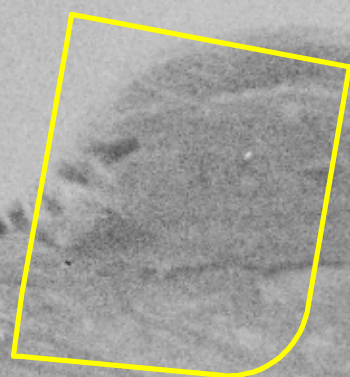
GEOTECHNICAL • ENVIRONMENTAL

SITE LOCALITY AND LAYOUT.
BOREHOLE AND TEST PIT
DETAILED SITE (CONTAMINATION) ASSESSMENT
PART 1 MCINTOSH DRIVE, MAYFIELD WEST

CLIENT Ausgrid		RCA Ref 17466-201/1	
DRAWN BY SH	SCALE 1:800 (A3)	DRAWING No 1	REV 1
APPROVED BY FB	DATE 18/03/2025	OFFICE NEWCASTLE	

Appendix B

Desktop Assessment Information

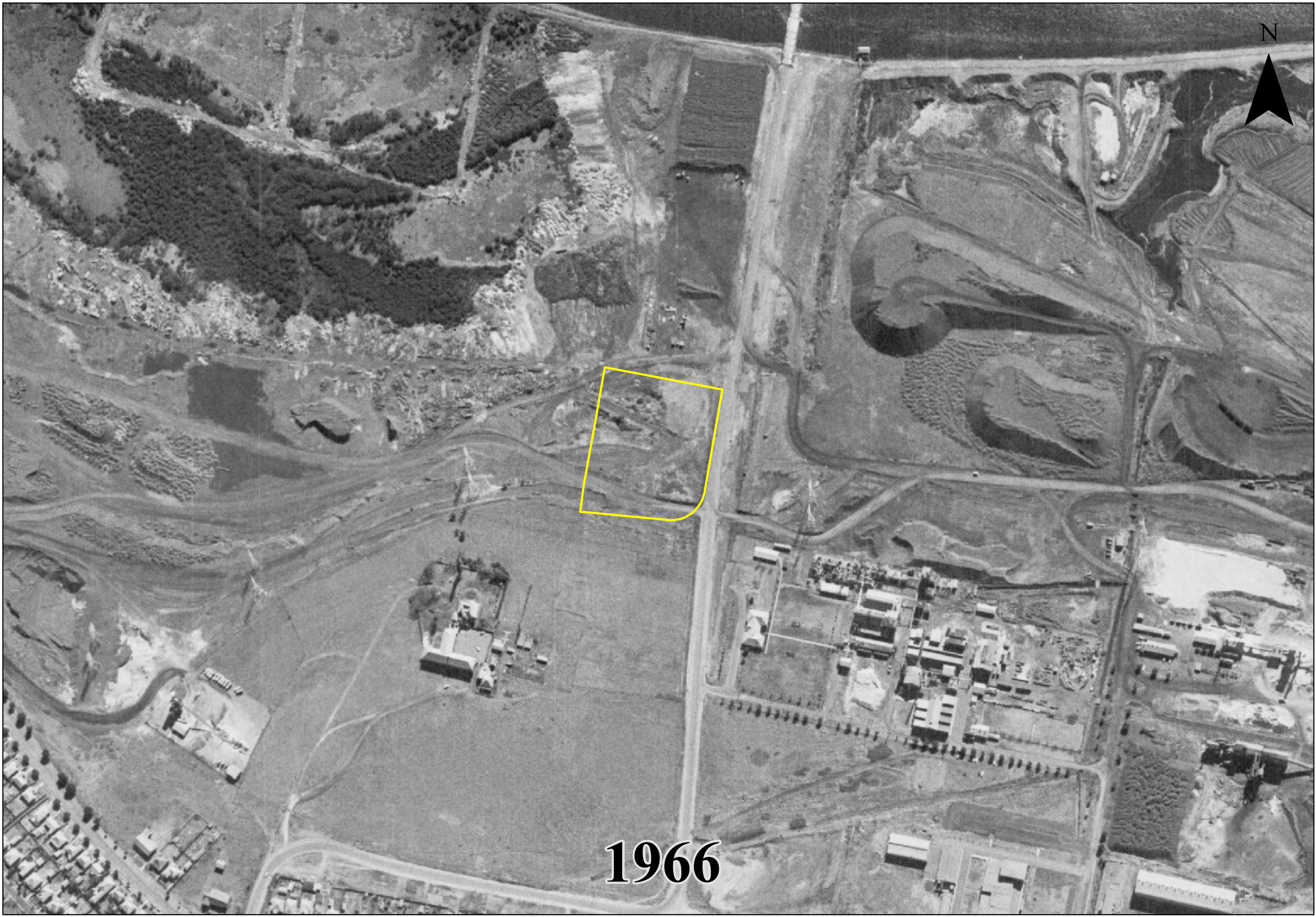


1954

N



1966





1976



N



1985



N



1990





1998

N



2001





June
2005

N



January
2007





August
2009





August
2011



N



October
2016





**June
2022**

N



October
2024







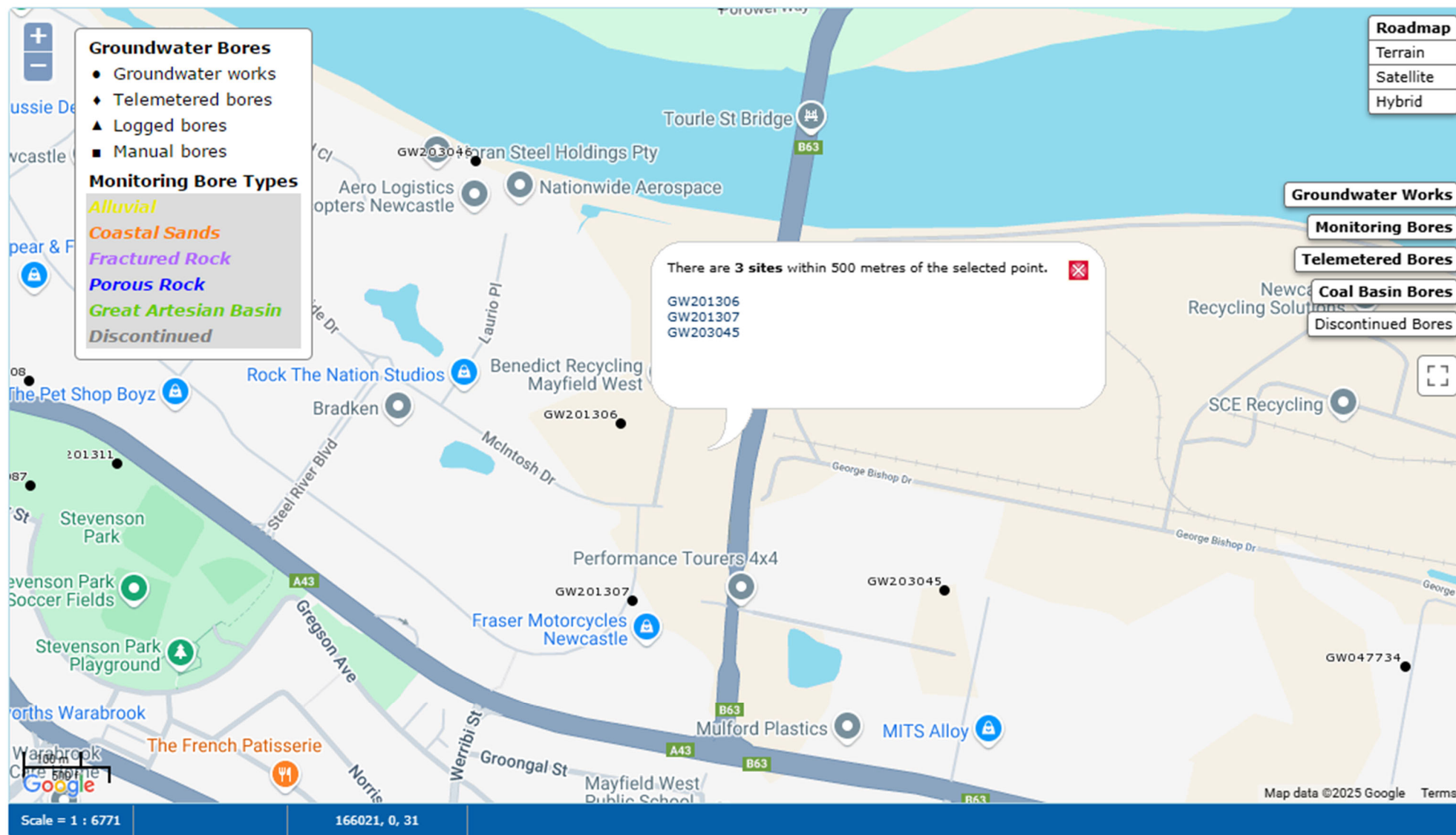






Appendix C

Registered Groundwater Well Information



WaterNSW

Work Summary

GW201306

Licence: 20BL172172

Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Cable Tool - D
Owner Type: Private

Commenced Date:
Completion Date: 28/05/2009

Final Depth: 21.00 m
Drilled Depth: 21.00 m

Contractor Name: Total Drilling
Driller: Christopher David Kieman
Assistant Driller: Fred Chittleburg

Property: N/A 8 Frost Drv WAYFIELD WEST 2304
NSW
GWMA:
GW Zone:

Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

County
Form A: NORTHUMBERLAND
Licensed: NORTHUMB

Parish
NEWCA
NEWCASTL

Cadastre
16//270249
Whole Lot 63//270249

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:

CMA Map: 9232-3S
Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6361020.000
Easting: 381235.000

Latitude: 32°52'57.1"S
Longitude: 151°43'49.3"E

GS Map: -

MGA Zone: 56

Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	14.00	100			Cable Tool - Drill & Drive Casin
1		Hole	Hole	14.00	21.00	100			Rotary Mud
1		Annulus	Bentonite	0.00	16.00	100	60		PL-Poured/Shovelled
1		Annulus	Waterworm/Rounded	16.00	21.00	100	60		Graded, PL-Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	21.00	60	51		Seated on Bottom, Screwed, S: 20.00-21.00m
1	1	Opening	Slots - Horizontal	17.00	20.00	60		0	Mechanically Slotted, PVC Class 18, Screwed, A: 0.50mm

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	14.00	14.00	Fill; dark grey to dark brown, clay-silty, pieces of slag, concrete, rock, moist	Fill	
14.00	21.00	7.00	Sandy Clay (Estuarine Sediments); black-dark grey, high organic content, shell fragments	Sandy Clay	

Remarks

28/05/2009: Form A Remarks:
Nat Carling, 28-Mar-2012; GPS provided by consultant.

*** End of GW201306 ***

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW

Work Summary

GW201307

Licence: 20BL172171

Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 22/05/2009

Final Depth: 15.80 m
Drilled Depth: 20.15 m

Contractor Name: Total Drilling
Driller: Christopher David Kiernan
Assistant Driller: Fred Chittleburg

Property: N/A 3 Murry Dwyer Cdt MAYFIELD WEST
2304 NSW

Standing Water Level (m):

GWMA:
GW Zone:

Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

County
Form A: NORTHUMBERLAND
Licensed: NORTHUMB

Parish
NEWCA
NEWCASTL

Cadastre
RD ADJ 51/270249
Whole Lot 105/270249

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:

CMA Map: 9232-3S
Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6360748.000
Easting: 381256.000

Latitude: 32°53'06.0"S
Longitude: 151°43'50.0"E

GS Map: -

MGA Zone: 56

Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	3.20	100			Auger - Solid Flight
1		Hole	Hole	3.20	20.15	100			Rotary - Coring
1		Annulus	Bentonite	0.00	9.30	100	60		PL-Poured/Shovelled
1		Annulus	Waterworm/Rounded	9.30	15.80	100	60		Graded, PL-Poured/Shovelled
1		Backfill	Bentonite	15.80	20.15	100			
1	1	Casing	Pvc Class 18	0.00	9.80	60	51		Seated, Screwed
1	1	Opening	Slots - Horizontal	9.80	15.80	60		0	Mechanically Slotted, PVC Class 18, Screwed, A: 0.50mm

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.00	2.00	Fill; silt, clayey, brown-dark grey-black, brick, concrete & slag pieces	Fill	
2.00	3.20	1.20	Shale, severely weathered, soft, fine grained, sandy silt	Shale	
3.20	12.05	8.85	Sandstone, siltstone layers, grey to brown, with darker laminae	Sandstone	
12.05	13.05	1.00	Coal, black, brittle, hard with silt band of approx 4cm	Coal	
13.05	20.15	7.10	Sand-Siltstone; grey to dark grey, in parts laminated	Sand	

Remarks

22/05/2009: Form A Remarks:
Nat Carling, 28-Mar-2012; GPS provided by consultant.

*** End of GW201307 ***

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW

Work Summary

GW203045

Licence: 20BL173470

Licence Status: CANCELLED

Authorised Purpose(s): ENVIRONMENT REHABILITATION, INDUSTRIAL
Intended Purpose(s): ENVIRONMENT REH

Work Type: Excavation
Work Status: Abandoned, Backfilled
Construct.Method: Other
Owner Type: Private

Commenced Date:
Completion Date: 08/08/2013

Final Depth: 2.50 m
Drilled Depth: 2.50 m

Contractor Name: (None)
Driller: Unknown Unknown
Assistant Driller:

Property: N A Woodstock St MAYFIELD 2304 NSW
GWMA:
GW Zone:

Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

County
Form A: NORTHUMBERLAND
Licensed: NORTHUMB

Parish
NEWCA
NEWCASTL

Cadastre
11//625019
Whole Lot 11//625019

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:

CMA Map: 9232-3S
Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6360770.000
Easting: 381740.000

Latitude: 32°53'05.5"S
Longitude: 151°44'08.6"E

GS Map: -

MGA Zone: 56

Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	2.50	0			Other
1		Backfill	Drilled Cutting	0.00	2.50				

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.15	0.15	Topsoil/Fill; Silty Sand, dark brown	Topsoil	
0.15	1.50	1.35	Fill; Sandy Silt; dark grey, very strong PAH odour, heading in all directions phase separated hydrocarbon	Fill	
1.50	2.50	1.00	Fill; as above, phase separated hydrocarbon in groundwater & evident on soil, wet at depth	Fill	

Remarks

08/08/2013: Form A Remarks:
Nat Carling, 7-May-2015; Temporary remediation pit completed - assumed backfilled. GPS provided on the Form-A.

*** End of GW203045 ***

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Appendix D

Screening Levels and Guidelines

NATIONAL ENVIRONMENT PROTECTION (ASSESSMENT OF SITE CONTAMINATION) MEASURE 1999 AS AMENDED 2013

Soil

The investigation and screening levels (ISL) utilised for the assessment of the soil on site were sourced from the National Environment Protection Measure for the Assessment of Site Contamination (ASC NEPM, Ref [5]). These ISL are not derived as acceptance criteria for contamination at a site, but as levels above which specific consideration of risk, based on the site use and potential exposure, is required. If a risk is determined as present, then remediation and/or management must be undertaken.

Assessment ISL are based on:

- Human Health.

Intentionally conservative health investigation levels (HIL) have been derived for four (4) generic land use settings.

- HIL 'A' - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry). This category includes children's day care centres, preschools and primary schools.
- HIL 'B' - Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
- HIL 'C' - 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).
- HIL 'D' - Commercial/industrial such as shops, offices, factories and industrial sites.

RCA have adopted the HIL 'D' scenario as the most applicable for the site / proposed development.

The exposure scenario(s) for the derivation of the relevant land use setting is set out in the table below.

Commercial/Industrial Premises

Summary of Exposure Pathways	Units	Parameters
		Adult
Body Weight	kg	70
Exposure Duration	years	30
Exposure Frequency	days/year	240
Soil / dust ingestion rate*	mg/day	25
Soil / dust to skin adherence factor	mg/cm ² /day	0.5
Skin surface area	cm ²	20,000
Fraction of skin exposed	%	31.5
Dermal absorption factor	%	Chemical specific values applied
Time spent indoors on site each day	hours	8
Time spent outdoors on site each day	hours	1
Home-grown fraction of vegetables consumed	%	0
Vegetable and fruit consumption rate	g/day	-
Averaging time for carcinogens ('lifetime')	years	70
Dust lung retention factor	%	37.5

* Soil ingestion rates for the HIL D scenario are based on the default soil/dust ingestion rates, corrected for an 8 hr/day daily exposure duration (50% of total waking hours)

Health screening levels (HSL) have been determined for risks associated from vapour intrusion from petroleum¹⁶ compound contamination for the same land use settings. These HSL are additionally based on the fraction of compound, the soil texture and the depth of the encountered soil.

Direct hydrocarbon contact criteria are not provided in the ASC NEPM (Ref [5]), however these are provided in CRC Care Technical Report 10 (Ref [6]) which is the source document for the HSL.

- **Ecological Health**

These levels are considered to apply to soil within two (2) metres of the surface, the root zone and habitation zone of many species.

Ecological investigation levels (EIL) have been determined for arsenic, copper, chromium III, DDT, naphthalene, nickel, lead and zinc in soil based on species sensitivity model and for three (3) generic land use settings:

- Areas of ecological significance (AES) – for areas where the primary intention is for the conservation and protection of the natural environment. Protection level of 99%.

¹⁶ Laboratory analysis of hydrocarbons is being reported as total recoverable hydrocarbons (TRH). This testing method includes all forms of hydrocarbons, not just petroleum hydrocarbons and therefore can be considered a conservative measure against the chosen TPH criteria. Further laboratory analysis using a silica gel clean up (TRH_{sg}) is considered to enable a better identification of the extent of petroleum-based contamination.

- Urban residential areas and public open space (URPOS) – broadly equivalent to the HIL A, HIL B and HIL C land use settings. Protection level of 80%.
- Commercial and industrial land uses (C&I) – considered to be broadly equivalent to HIL D land use setting. Protection level of 60%.

RCA have adopted the C&I scenario as the most applicable for the site / proposed development.

Methodology for the derivation of EIL for other contaminants is available in the ASC NEPM (Ref [5]) and requires additional soil character data; this has not been undertaken as part of this assessment.

Ecological screening levels (ESL) have been determined for petroleum compound contamination. Due to limitations in the data only moderate reliability ESL have been determined for fractions $<C_{16}$, applied generically in fine- and coarse-grained soils. ESL for petroleum fractions $> C_{16}$, BTEXN and naphthalene are considered low reliability.

- Aesthetics

Aesthetic considerations operate separately to the HIL / HSL and EIL / ESL assessment. Issues to be considered include:

- Highly malodorous soils or extracted groundwater (e.g., strong residual petroleum hydrocarbon odours, hydrogen sulphide in soil or extracted groundwater, organosulfur compounds).
- Hydrocarbon sheen on surface water.
- Discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature.
- Large monolithic deposits of otherwise low-risk material, e.g., gypsum as powder or plasterboard, cement kiln dust.
- Presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste.
- Soils containing residue from animal burial (e.g., former abattoir sites).

Site assessment requires consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity. For example, higher expectations for soil quality would apply to residential properties with gardens compared with industrial settings.

Tier 1 assessment comprises the comparison of the soil data with the HIL / HSL and EIL / ESL. In the event that some concentrations are in excess of the relevant criteria, the summary statistics of the data set may be utilised for assessment purpose. Consideration of a range of statistics is recommended; at a minimum the 95%UCL_{ave} should be compared to the relevant criteria as long as:

- No single value exceeds 250% of the relevant criterion.
- The standard deviation of the results for each analyte is less than 50% of the relevant criterion.

In addition to appropriate consideration and application of the HSL and ESL, there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL).
- Fire and explosive hazards.

- Effects on buried infrastructure e.g., penetration of, or damage to, in-ground services by hydrocarbons.

The ASC NEPM (Ref [5]) has therefore provided management limits, the application of which will require consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. The management limits may have less relevance at operating industrial sites (including mine sites) which have no or limited sensitive receptors in the area of potential impact. When the management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

The presence of site hydrocarbon contamination at the levels of the management limits does not imply that there is no need for administrative notification or controls in accordance with jurisdiction requirements.

Figure 5 below has been taken from the ASC NEPM (Ref [5]) to illustrate the assessment methodology in regards to petroleum contamination.

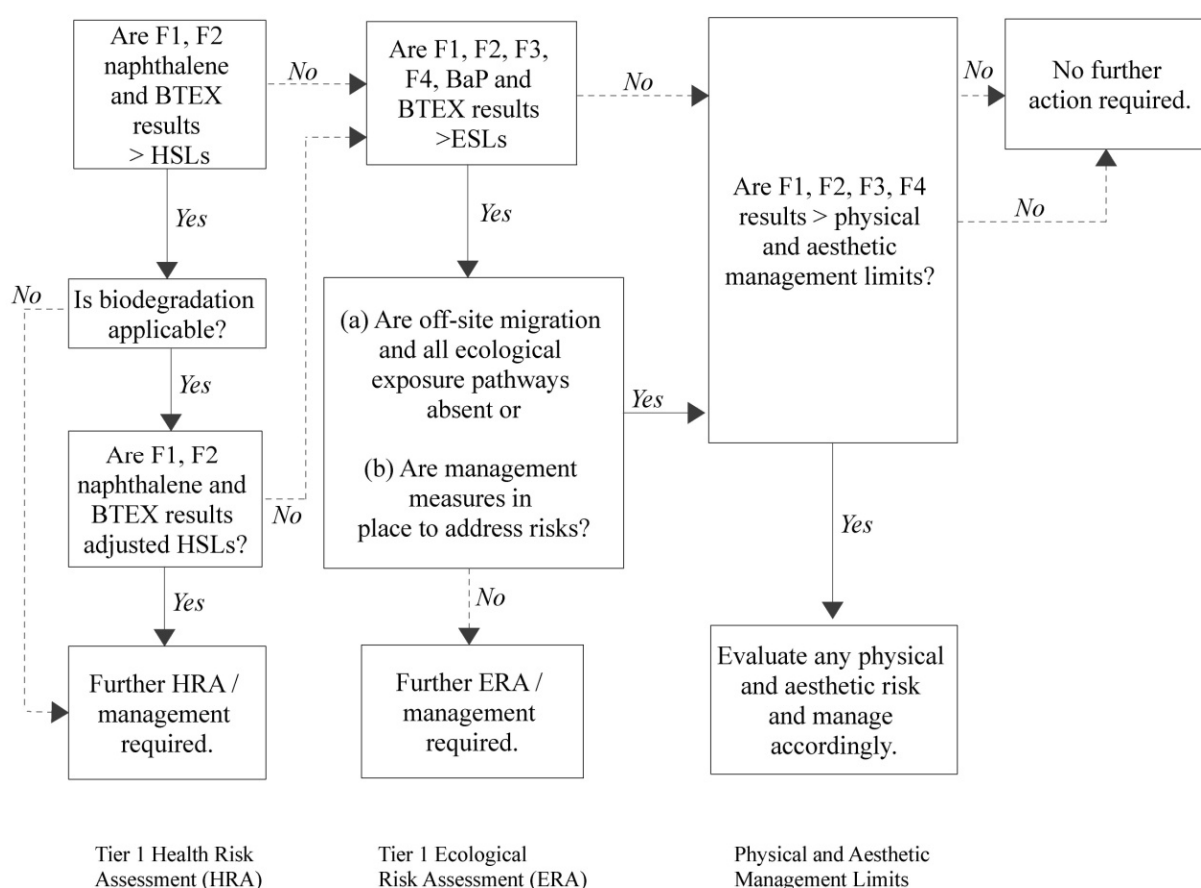


Figure 5 *Flowchart for the Tier 1 human and ecological risk assessment of petroleum hydrocarbon contamination – application of HSL and ESL and consideration of management limits*

NSW EPA 2014, WASTE CLASSIFICATION GUIDELINES

The waste classification guidelines (Ref [17]) are designed to ensure waste streams are managed appropriately and in accordance with the Protection of the Environment Operations Act 1997 (the POEO Act) and its associated regulations. The guidelines classify waste into groups which pose similar risks to the environment and human health; and facilitate their management and appropriate disposal.

Six (6) waste classes are used:

- Special waste:
 - Clinical or related waste, asbestos waste, waste tyres.
- Liquid waste:
 - As defined by angle of repose, temperature at which it is free flowing and physical composition.
- Hazardous waste.
- Restricted solid waste.
- General solid waste (putrescible).
- General solid waste (non-putrescible).

Classification begins with determination of whether the waste is 'special waste'. If not determination of whether material is classified as liquid waste is then required. Material which is not liquid waste, or is special waste due to asbestos content, must be compared to pre-classification definitions. Without pre-classification, the potential for hazardous characteristics (such as explosives, gases, flammable materials, oxidising, toxic and corrosive substances) must be established. If material cannot be classified as hazardous, assessment by chemical analysis must be undertaken. Without assessment, material must be managed as if hazardous waste.

Chemical classification is two tiered. The first set of criteria is based on total contaminant concentrations, whereas the second set of criteria is based on a leachable (TCLP) concentration and a total contaminant concentration. The total concentrations criteria are generally higher in conjunction with TCLP testing than if it was not undertaken.

Appendix E

Site Photographs



PHOTOGRAPH 1: Looking east along the southern boarder towards Tourle Street.



PHOTOGRAPH 2: Looking north along the western boundary from the southwest corner of site.



PHOTOGRAPH 3: Looking north down the western border of the site.



PHOTOGRAPH 4: Looking northeast from the southwest corner of site.



PHOTOGRAPH 5: Looking northwest from the southeast corner of the site.



PHOTOGRAPH 6: Looking southeast from northwest corner of site.



PHOTOGRAPH 7: Looking east down the northern boundary from the northwestern corner of the site.



PHOTOGRAPH 8: Construction materials - old pipes and concrete frames along the northern boundary of the site.



PHOTOGRAPH 9: Old electrical box located in the northwestern corner of the site.



PHOTOGRAPH 10: Looking southwest from the northwestern corner of the site.



Groundwater well, BHW2/1, situated in the northeastern corner of the site.

Appendix F

Test Pit Logs

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 13/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Seepage 		TP1A 0.10m			FILL, (CWR), Silty Sandy GRAVEL fine to coarse, angular, dark brown, with cobbles ~200mm - Building refuse, occasional brick fragments - Heterogeneous	-0	D		FILL - presumed capping layer - no odour
			0.40		FILL, (CWR), comprising GRAVEL and COBBLES, dark grey/black, angular, with rock, brick, steel scraps ~200mm cobbles - Heterogeneous		W		- presumed capping layer - no odour Perched groundwater @ (0.75m)
			0.5						
		1.00m TP1B 1.10m	1.0 1.10		TEST PIT TP1 TERMINATED AT 1.10 m Practical bucket refusal in FILL	-0			
			1.5						
			2.0						
LOGGED: SH					CHECKED:			DATE:	

ENVIRONMENTAL TEST PIT LOG

TP10

SHEET 1 OF 1

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 14/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP10A /QA3 0.10m			FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black, with occasional brick fragments and slag cobbles	-0	D		FILL - presumed capping layer - no odour
			0.5						
		1.00m	1.0						
		TP10B 1.10m			- difficult excavation at 1.1m	-0.2			
			1.20						
		1.30m			FILL, Silty Sandy GRAVEL, fine to coarse, angular, light brown - Difficult excavation with ripping tyne		D		- no odour
		TP10C 1.40m	1.40			-0.1			
			1.5		TEST PIT TP10 TERMINATED AT 1.40 m Practical bucket refusal in FILL				Potential shallow bedrock @ 1.4m
			2.0						
LOGGED: SH					CHECKED:			DATE:	

ENVIRONMENTAL TEST PIT LOG

TP2

SHEET 1 OF 1

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 14/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP2A 0.10m			FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black/brown - Difficult excavation with ripping tyne - Occasional pieces of slag - Building refuse - brick fragments, steel, plastic and asphalt - Heterogeneous	-0	D		FILL - presumed capping layer - no odour
			0.5						
			0.80						
		1.00m TP2B 1.10m	1.0		FILL, (CWR), comprising coarse GRAVEL and COBBLES with occasional brick, asphalt and slag fragments ~(100-400mm) cobbles / boulders -Heterogeneous	-8.5	D		- black clay like material with high plasticity - slight hydrocarbon smell - presumed capping layer
		1.50m TP2C 1.60m	1.5			-5.6			
			2.0		TEST PIT TP2 TERMINATED AT 1.60 m Practical bucket refusal in FILL				
LOGGED: SH					CHECKED:			DATE:	

ENVIRONMENTAL TEST PIT LOG

TP3

SHEET 1 OF 1

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 14/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP3A 0.10m			FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown, with some cobbles - Heterogeneous	-2.3	D		FILL - organics present - slight hydrocarbon odour
			0.50		FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey - Heterogeneous		D		- large piece of concrete @ 0.6m (0.6 x 0.6m) - occasional cobble sized pieces of asphalt ~ (160-200mm) - concrete pipe fragments - no odour
		1.00m TP3B 1.10m	1.0			-0			
		1.5 1.60							
		1.70m TP3C 1.80m			FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, dark grey/ black - Difficult excavation - Heterogeneous	-1.7	D		FILL - slight hydrocarbon odour -perumed capping layer
			2.0		TEST PIT TP3 TERMINATED AT 1.80 m Practical bucket refusal in FILL				Potential drainage pipe located - possible fragment like other
LOGGED: SH				CHECKED:				DATE:	

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 14/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP4A 0.10m			FILL, Topsoil / CWR Silty Sandy GRAVEL, fine to coarse, black - Building refuse, occasional brick fragments and cobbles of coal and asphalt - Heterogeneous	-0	D		FILL - layer becomes solid from 0.6 - hard capping layer @(0.6-0.8m) - no odour
			0.5						
		1.00m	1.0						
		TP4B 1.10m	1.10		FILL, (CWR), Silty Clayey Sandy GRAVEL, fine to coarse, black / purple brown with occasional bricks	-0	M		- slight hydrocarbon odour -persumed capping layer
		1.20m							
		TP4C 1.30m	1.30		FILL (CWR), Silty Sandy GRAVEL, with a trace of clay, fine to coarse, black, with occasional slag cobbles - Heterogeneous	-0	M		FILL - no odour - persumed capping layer
		1.90m							
		TP4D 2.00m	2.0				-0		
					TEST PIT TP4 TERMINATED AT 2.00 m				
LOGGED: SH				CHECKED:				DATE:	

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 13/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP5A 0.10m			FILL, Silty Sandy Clayey GRAVEL, fine to medium, angular, light brown, occasional cobbles ~100-200mm - Large pieces of concrete - Occasional bricks and terracotta pipe fragments - Heterogeneous	-0	D		FILL - some organics presents - no odour
		1.00m							
		TP5B 1.10m	1.00		FILL, Silty Sandy GRAVEL, fine to medium, angular, light brown, with large pieces of concrete (300-800mm) - Building refuse, bricks/ brick fragments - Heterogeneous	-0	D		- no odour
		1.50m							
			1.60		FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black		D	FILL - presumed capping layer - no odour	
		2.00m	2.0						
		TP5C 2.10m				-0			
					TEST PIT TP5 TERMINATED AT 2.30 m				
LOGGED: SH				CHECKED:				DATE:	

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 13/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP6A /QA1 0.10m			FILL, Silty Sandy GRAVEL, fine to coarse, dark brown, with occasional cobbles and brick fragments/concrete - Heterogeneous	-0	D		FILL - no odour
			0.5						
			0.75						
		1.00m TP6B 1.10m	1.0		FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey, occasional cobbles/ boulders ~(100-400mm), with some coal fragments - Building refuse - bricks fragments - Heterogeneous	-0	D		- no odour
			1.30						
		1.90m TP6C 2.00m	1.5		FILL, (CWR), Sandy Silty GRAVEL, fine to coarse, dark grey/ black, occasional cobbles	-0	D		FILL - presumed capping layer - no odour
			2.0		TEST PIT TP6 TERMINATED AT 2.00 m				
LOGGED: SH					CHECKED:			DATE:	

PROJECT No: 17466

CLIENT: Ausgrid

PROJECT: Detailed Site (Contamination) Assessment

LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 13/01/2025

SURFACE RL:

COORDS:

EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP7A 0.10m			FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown, with occasional brick fragments - Heterogeneous	-0	D		FILL - large pieces of concrete ~ (400x1000mm) - organics @ ~1.0m - no odour
		1.00m	1.0						
		TP7B 1.10m							
			0.5						
					</				

ENVIRONMENTAL TEST PIT LOG

TP8

SHEET 1 OF 1

PROJECT No: 17466
 CLIENT: Ausgrid
 PROJECT: Detailed Site (Contamination) Assessment
 LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 14/01/2025
 SURFACE RL:
 COORDS:
 EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information					
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered		TP8A /QA2 0.10m			FILL, Silty Sandy GRAVEL, fine to coarse, angular, brown, with trace of CWR - Heterogeneous	-0	D		FILL - organics present - no odour
		0.40							
		0.5							
		1.00m	1.0		FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black with occasional asphalt fragments - Heterogeneous		D		- presumed capping layer - gravel getting coarser - occasional cobbles/ boulders (150x300mm) - occasional brick fragments - no odour
		TP8B 1.10m				-0			
			1.5						
		1.90m							
		TP8C 2.00m	2.0			-0			
					TEST PIT TP8 TERMINATED AT 2.00 m				
LOGGED: SH					CHECKED:			DATE:	

ENVIRONMENTAL TEST PIT LOG

TP9

SHEET 1 OF 1

PROJECT No: 17466
 CLIENT: Ausgrid
 PROJECT: Detailed Site (Contamination) Assessment
 LOCATION: 1 McIntosh Dr, Mayfield West

DATE: 13/01/2025
 SURFACE RL:
 COORDS:
 EXCAVATION METHOD: Excavator 8t, with 300, 450 & 600 bucket

Test Pit Information				Field Material Information						
WATER	FIELD TEST	SAMPLE	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppm)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS	
Not Encountered		TP9A 0.10m			FILL, Silty Clayey Sandy GRAVEL, fine to coarse, brown, with occasional concrete cobbles, brick fragments	-0	D		FILL - no odour	
			0.5							
			0.70							
		1.00m TP9B 1.10m	1.0		FILL, Silty Sandy GRAVEL, fine to coarse, and COBBLES cobbles -(100-400mm) light/dark grey -Heterogeneous	-0	D		- cobbles made of concrete/ slag with occasional brick fragments - large pieces of concrete ~500x1200 - pieces of fabric - large pieces of wood - no odour	
			1.50							
					2.00m TP9C 2.10m	2.0			FILL, (CWR), Silty Sandy Clayey GRAVEL, fine to coarse, dark grey/black, with cobble sized pieces of coal	-0
					TEST PIT TP9 TERMINATED AT 2.30 m					
LOGGED: SH				CHECKED:				DATE:		

Appendix G

Quality Assurance Review and
Laboratory Report Sheets

A total of three (3) soil duplicate samples were submitted blind to the laboratory for analysis with the batch of samples, including one (1) interlaboratory and two (2) intralaboratory duplicates. This represents a percentage of 10%, in accordance with the frequency recommended by the Australian Standard AS4482.1 (Ref [7]) and RCA protocol.

RCA omitted the field and trip blank due to the low potential for cross-contamination from the field conditions and transport process, the trip spikes due to the low potential for volatile loss during the transport process and the equipment wash due to the low potential from the sampling equipment.

Results, as shown further in this **Appendix**, indicate a total of nine (9) soil analyses which report RPD in excess of the acceptance criteria:

- TP6A/QA1 had an elevated RPD for fluoranthene, pyrene and nickel. This sample is described as (FILL) silty sandy gravel, and it is therefore considered that sample heterogeneity is the likely cause of the high RPD. There is some uncertainty associated with this sample and the duplicate reported the higher concentrations; therefore, the duplicate results have been used for the characterisation of the site.
- TP8A/QA2 had an elevated RPD for phenanthrene, fluoranthene, pyrene, benz(a)anthracene and chrysene. This sample is described as (FILL) silty sandy gravel, and it is therefore considered that sample heterogeneity is the likely cause of the high RPD. There is some uncertainty associated with this sample and the duplicate reported the higher concentrations; therefore, the duplicate results have been used for the characterisation of the site.
- TP10A/QA3 had an elevated RPD for naphthalene. This sample is described as (FILL (CWR)) silty sandy gravel, and it is therefore considered that sample heterogeneity is the likely cause of the high RPD. There is some uncertainty associated with this sample and the duplicate reported the higher concentrations and the duplicate reported the higher concentrations; therefore, the duplicate results have been used for the characterisation of the site.

EnviroLab was chosen as the primary laboratory ALS was chosen as the secondary laboratory. Both laboratories used for analysis are NATA accredited and are experienced in the analytical requirements for potentially contaminated soil.

EnviroLab and ALS undertook internal quality assurance testing. Results are contained within the laboratory report sheets, included in this **Appendix**. **Table 10** presents the review of the primary laboratory.

Table 10 *Internal Quality Assurance Review*

	Number Samples (including QA)	Laboratory Duplicates	Spikes	Laboratory Control Samples	Laboratory Blanks
Requirement		10%	5%	One every batch	One every batch
Soil					
TRH(C6-C10) /BTEXN	29	3 (0)	2 (0)	2	1
TRH(C10-C40)	29	3 (0)	2 (0)	2	1
PAH	29	3 (0)	2 (0)	2	1
Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	29	3 (0)	2 (0)	2	1

Numbers in brackets refer the tests undertaken on samples not from this project but within the same laboratory batch.

Examination of the above table reveals that EnviroLab have undertaken laboratory quality assurance testing in accordance with the ASC NEPM (Ref [5]).

With regards to the results:

- Recoveries of surrogates were within acceptance criteria of 70-130% with the exception of four (4) TRH(C₁₀-C₄₀) surrogates in four (4) samples:
 - TP7B which had a recovery of 135%. This is considered to indicate some uncertainty with the results however, as the uncertainty is conservative it is not considered significant.
 - TP8A, TP10A and QA3 recovery percentages were unable to be reported as the high concentration of analytes in the samples have caused interference. The results for TP8A are all within the relevant guidelines and as such the uncertainty is not considered significant. The results for TP10A are all within the relevant guidelines with the exception of TRH >C₁₀-C₁₆ which is in excess of the ESL; there is no criterion for F2 in a commercial / industrial land use setting and therefore the uncertainty is not considered significant. The results for QA3 are all within the relevant guidelines and as such the uncertainty is not considered significant.

It is noted that phenolic surrogates are reported (due to the concurrent PAH analytical method) and indicate numerous results below 70%. However, as no phenols analysis was undertaken these results are not considered relevant to the site characterisation.

- No laboratory blank result was detected above the practical quantification limit (PQL).
- Relative Percentage Differences for duplicates were within acceptance criteria as defined for intralaboratory duplicates further in this **Appendix** with the exception of:
 - Anthracene, pyrene and copper in TP5A had an RPD of 67%, 53% and 87% respectively. This sample is described as (FILL) silty sandy clayey gravel, and it is therefore considered that sample heterogeneity is the likely cause of the high RPD. There is some uncertainty associated with the sample; however, the results were all well within the relevant guidelines and as such the uncertainty is not considered significant.
 - It is noted that EnviroLab undertook a triplicate of this sample for PAH and metals based on the RPD results which did indicate significant uncertainty in the PAH and copper results as well as chromium. RCA have therefore used the triplicate results for the characterisation of the site.
 - Mercury in TP1A had an RPD of 67%. This sample is described as (FILL (CWR)) silty sandy gravel, and it is therefore considered that sample heterogeneity is the likely cause of the high RPD. There is some uncertainty associated with the sample; however, the results were all well within the relevant guidelines and as such the uncertainty is not considered significant.
- Recoveries of laboratory control samples were within the acceptance criteria of 70-130%.
- Recoveries of matrix spikes were within acceptance criteria of 70-130% with the exception of:
 - M+p xylene in TP1B had a recovery of 68%, and two (2) TRH fractions, four (4) PAH compounds and five (5) metals in TP1B were unable to be reported. The low m+p xylene recovery is considered a minor non-compliance and not significant and the absence of a spike result for the TRH and PAH fractions, and metals is not considered to reflect uncertainty in the reported results with the potential exception of chromium.

- The PQL for cadmium was adjusted to 0.8mg/kg by the laboratory due to poor recovery and the potential for under-analysis in samples of similar strata noted.
- Holding times were within laboratory specified time frames

Quality Assurance Type	Primary PQL	Secondary PQL	Intralaboratory Duplicate		RPD%	Interlaboratory Duplicate		RPD%	Intralaboratory Duplicate		RPD%
Sample Identification			TP6A	QA1		TP8A	QA2		TP10A	QA3	
Sample Depth (m)			0.1			0.1			0.1		
Date			13/01/2025			14/01/2025			14/01/2025		
Sample Profile			FILL, Silty Sandy GRAVEL, fine to coarse, dark brown		FILL, Silty Sandy GRAVEL, fine to coarse, angular, brown, with trace of CWR	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black					
Sample Purpose			Characterisation				Characterisation				
Sample collected by			RCA - SH				RCA - SH				
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)											
Benzene	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Toluene	0.5	0.5	0.25	0.25	0.0	0.25	0.25	0.0	0.25	0.25	0.0
Ethylbenzene	1	0.5	0.5	0.5	0.0	0.5	0.25	66.7	0.5	0.5	0.0
meta- and para-Xylene	2	0.5	1	1	0.0	1	0.25	120.0	1	1	0.0
ortho-Xylene	1	0.5	0.5	0.5	0.0	0.5	0.25	66.7	0.5	0.5	0.0
Polycyclic Aromatic Hydrocarbons (PAH)											
Naphthalene	1	1	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Total Recoverable Hydrocarbons (TRH)											
TRH C ₆ -C ₁₀	25	10	12.5	12.5	0.0	12.5	5	85.7	12.5	12.5	0.0
TRH >C ₁₀ -C ₁₆	50	50	25	25	0.0	140	100	33.3	180	120	40.0
TRH >C ₁₆ -C ₃₄	100	100	50	50	0.0	600	750	22.2	780	590	27.7
TRH >C ₃₄ -C ₄₀	100	100	50	50	0.0	200	150	28.6	210	120	54.5
Polycyclic Aromatic Hydrocarbons (PAH)											
Naphthalene	0.1	0.5	0.1	0.3	100.0	0.5	1.1	75.0	0.2	0.5	85.7
Acenaphthylene	0.1	0.5	0.05	0.05	0.0	0.05	0.25	133.3	0.05	0.05	0.0
Acenaphthene	0.1	0.5	0.05	0.05	0.0	0.05	0.25	133.3	0.05	0.05	0.0
Fluorene	0.1	0.5	0.05	0.05	0.0	0.05	0.25	133.3	0.05	0.05	0.0
Phenanthrene	0.1	0.5	0.4	0.8	66.7	1.6	3.9	83.6	2.1	2.8	28.6
Anthracene	0.1	0.5	0.05	0.1	66.7	0.05	0.25	133.3	0.05	0.05	0.0
Fluoranthene	0.1	0.5	0.3	0.8	90.9	0.4	1	85.7	0.5	0.6	18.2
Pyrene	0.1	0.5	0.3	0.8	90.9	0.4	0.9	76.9	0.4	0.5	22.2
Benz(a)anthracene	0.1	0.5	0.2	0.4	66.7	0.3	0.6	66.7	0.3	0.4	28.6
Chrysene	0.1	0.5	0.2	0.4	66.7	0.4	0.8	66.7	0.4	0.5	22.2
Benzo(b,j)&(k)fluoranthene	0.2	1	0.4	0.7	54.5	0.3	0.5	50.0	0.2	0.3	40.0
Benzo(a) pyrene	0.05	0.5	0.2	0.3	40.0	0.2	0.25	22.2	0.1	0.2	66.7
Indeno(1,2,3-c,d)pyrene	0.1	0.5	0.1	0.2	66.7	0.05	0.25	133.3	0.05	0.05	0.0
Dibenz(a,h)anthracene	0.1	0.5	0.05	0.05	0.0	0.05	0.25	133.3	0.05	0.05	0.0
Benzo(g,h,i)perylene	0.1	0.5	0.2	0.3	40.0	0.1	0.25	85.7	0.05	0.05	0.0
Metals											
Arsenic	4	5	10	9	10.5	10	7	35.3	21	13	47.1
Cadmium*	0.8	1	0.4	0.4	0.0	0.4	0.5	22.2	0.4	0.4	0.0
Chromium	1	2	40	62	43.1	33	22	40.0	3	3	0.0
Copper	1	5	23	27	16.0	17	16	6.1	24	18	28.6
Lead	1	5	39	55	34.0	21	18	15.4	17	15	12.5
Mercury	0.1	0.1	0.1	0.1	0.0	0.1	0.05	66.7	0.3	0.2	40.0
Nickel	1	2	10	17	51.9	13	12	8.0	9	7	25.0
Zinc	1	5	94	140	39.3	42	48	13.3	50	42	17.4

All units in mg/kg

PQL = Practical Quantitation Limit.

Results underlined were not detected and are reported as half the detection limit for statistical purpose.

* The primary PQL for Cd has been adjusted to 0.8 for all samples to address any uncertainty due to low spike recovery in TP1B.

BOLD identifies where RPD results

intralaboratory | interlaboratory

>50	>60	where sample results are >10 x PQL
>75	>85	where sample results are > 5 to ≤10 x PQL
>100	>100	where sample results are >2 to ≤5 x PQL
AD>2.5 * PQL		where sample results are ≤2 x PQL

Where results are within two of the above ranges the most conservative criteria have been used to assess duplicate performance

CERTIFICATE OF ANALYSIS 370498

Client Details

Client	RCA Australia
Attention	Fiona Brooker
Address	PO Box 175, Carrington, NSW, 2294

Sample Details

Your Reference	<u>17466</u>
Number of Samples	29 Soil
Date samples received	16/01/2025
Date completed instructions received	16/01/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	22/01/2025
Date of Issue	22/01/2025
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Giovanni Agosti, Group Technical Manager
 Jack Wallis, Senior Chemist
 Timothy Toll, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		370498-1	370498-2	370498-3	370498-4	370498-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Date Sampled		13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	78	86	90	90	96

vTRH(C6-C10)/BTEXN in Soil

Our Reference		370498-6	370498-7	370498-8	370498-9	370498-10
Your Reference	UNITS	TB3B	TB3C	TB4A	TB4B	TB4C
Date Sampled		14/01/2025	14/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	75	83	104	98	96

vTRH(C6-C10)/BTEXN in Soil

Our Reference		370498-11	370498-12	370498-13	370498-14	370498-15
Your Reference	UNITS	TB5A	TB5B	TB5C	TP6A	TP6B
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	86	93	104	84	73

vTRH(C6-C10)/BTEXN in Soil

Our Reference		370498-16	370498-17	370498-18	370498-19	370498-20
Your Reference	UNITS	TP6C	TP7A	TP7B	TP7C	TP8A
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	83	94	94	87	100

vTRH(C6-C10)/BTEXN in Soil

Our Reference		370498-21	370498-22	370498-23	370498-24	370498-25
Your Reference	UNITS	TP8B	TP8C	TP9A	TP9C	TP10A
Date Sampled		14/01/2025	14/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	100	94	100	97

vTRH(C6-C10)/BTEXN in Soil

Our Reference		370498-26	370498-27	370498-28	370498-29
Your Reference	UNITS	TP10B	TP10C	QA1	QA3
Date Sampled		14/01/2025	14/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	87	108	82

svTRH (C10-C40) in Soil

Our Reference		370498-1	370498-2	370498-3	370498-4	370498-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Date Sampled		13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	22/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	140	<50
TRH C ₁₅ - C ₂₈	mg/kg	260	410	<100	620	190
TRH C ₂₉ - C ₃₆	mg/kg	260	310	<100	230	120
Total +ve TRH (C10-C36)	mg/kg	520	720	<50	990	310
TRH >C ₁₀ -C ₁₆	mg/kg	51	71	<50	270	57
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	51	71	<50	270	57
TRH >C ₁₆ -C ₃₄	mg/kg	420	600	110	640	260
TRH >C ₃₄ -C ₄₀	mg/kg	220	240	<100	120	<100
Total +ve TRH (>C10-C40)	mg/kg	690	920	110	1,000	310
Surrogate o-Terphenyl	%	107	105	96	125	102

svTRH (C10-C40) in Soil

Our Reference		370498-6	370498-7	370498-8	370498-9	370498-10
Your Reference	UNITS	TB3B	TB3C	TB4A	TB4B	TB4C
Date Sampled		14/01/2025	14/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	57	<50
TRH C ₁₅ - C ₂₈	mg/kg	140	<100	190	390	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	190	<100
Total +ve TRH (C10-C36)	mg/kg	140	<50	190	640	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	54	97	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	54	97	<50
TRH >C ₁₆ -C ₃₄	mg/kg	190	<100	240	480	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	110	<100
Total +ve TRH (>C10-C40)	mg/kg	190	<50	300	690	<50
Surrogate o-Terphenyl	%	112	96	110	109	89

svTRH (C10-C40) in Soil

Our Reference		370498-11	370498-12	370498-13	370498-14	370498-15
Your Reference	UNITS	TB5A	TB5B	TB5C	TP6A	TP6B
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	110	200	<100	150
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	110	200	<50	150
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	59	<50	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	59	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	140	240	<100	200
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	140	300	<50	200
Surrogate o-Terphenyl	%	95	89	105	86	96

svTRH (C10-C40) in Soil

Our Reference		370498-16	370498-17	370498-18	370498-19	370498-20
Your Reference	UNITS	TP6C	TP7A	TP7B	TP7C	TP8A
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	53	<50	80	70	110
TRH C ₁₅ - C ₂₈	mg/kg	350	<100	370	250	460
TRH C ₂₉ - C ₃₆	mg/kg	170	<100	230	<100	270
Total +ve TRH (C10-C36)	mg/kg	560	<50	680	320	840
TRH >C ₁₀ -C ₁₆	mg/kg	75	<50	100	88	140
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	75	<50	100	88	140
TRH >C ₁₆ -C ₃₄	mg/kg	440	120	490	280	600
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	160	<100	200
Total +ve TRH (>C10-C40)	mg/kg	520	120	760	370	930
Surrogate o-Terphenyl	%	116	92	135	123	#

svTRH (C10-C40) in Soil

Our Reference		370498-21	370498-22	370498-23	370498-24	370498-25
Your Reference	UNITS	TP8B	TP8C	TP9A	TP9C	TP10A
Date Sampled		14/01/2025	14/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	56	51	<50	57	140
TRH C ₁₅ - C ₂₈	mg/kg	260	230	<100	180	620
TRH C ₂₉ - C ₃₆	mg/kg	110	100	<100	<100	320
Total +ve TRH (C10-C36)	mg/kg	420	380	<50	240	1,100
TRH >C ₁₀ -C ₁₆	mg/kg	71	65	<50	68	180
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	71	65	<50	68	180
TRH >C ₁₆ -C ₃₄	mg/kg	310	280	<100	230	780
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	210
Total +ve TRH (>C10-C40)	mg/kg	380	340	<50	300	1,200
Surrogate o-Terphenyl	%	114	117	95	103	#

svTRH (C10-C40) in Soil

Our Reference		370498-26	370498-27	370498-28	370498-29
Your Reference	UNITS	TP10B	TP10C	QA1	QA3
Date Sampled		14/01/2025	14/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	90	<50	<50	92
TRH C ₁₅ - C ₂₈	mg/kg	390	<100	<100	470
TRH C ₂₉ - C ₃₆	mg/kg	230	<100	<100	220
Total +ve TRH (C10-C36)	mg/kg	710	<50	<50	790
TRH >C ₁₀ -C ₁₆	mg/kg	110	<50	<50	120
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	110	<50	<50	120
TRH >C ₁₆ -C ₃₄	mg/kg	510	<100	<100	590
TRH >C ₃₄ -C ₄₀	mg/kg	160	<100	<100	120
Total +ve TRH (>C10-C40)	mg/kg	780	<50	<50	840
Surrogate o-Terphenyl	%	123	98	100	#

PAHs in Soil						
Our Reference	UNITS	370498-1	370498-2	370498-3	370498-4	370498-5
Your Reference		TP1A	TP1B	TP2A	TP2B	TP3A
Date Sampled		13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Naphthalene	mg/kg	0.4	1.1	0.9	0.4	0.8
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.1	<0.1	0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.8	1.5	1.0	2.1	1.5
Anthracene	mg/kg	<0.1	0.4	<0.1	0.4	<0.1
Fluoranthene	mg/kg	0.7	3.3	0.4	2.7	0.5
Pyrene	mg/kg	0.6	3.1	0.4	2.5	0.5
Benzo(a)anthracene	mg/kg	0.4	1.3	0.2	1.2	0.3
Chrysene	mg/kg	0.5	1.3	0.3	1.1	0.4
Benzo(b,j+k)fluoranthene	mg/kg	0.8	2.4	0.4	2	0.4
Benzo(a)pyrene	mg/kg	0.3	1.4	0.2	0.82	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	0.9	<0.1	0.4	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.1	<0.1	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	1.1	0.1	0.4	0.2
Total +ve PAH's	mg/kg	5.1	18	4.0	14	5.0
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	2.0	<0.5	1.3	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	2.0	<0.5	1.3	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	2.0	<0.5	1.3	<0.5
Surrogate p-Terphenyl-d14	%	111	112	112	106	106

PAHs in Soil						
Our Reference		370498-6	370498-7	370498-8	370498-9	370498-10
Your Reference	UNITS	TB3B	TB3C	TB4A	TB4B	TB4C
Date Sampled		14/01/2025	14/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Naphthalene	mg/kg	0.4	0.2	0.3	15	0.7
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	3.3	0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	0.7	0.3
Fluorene	mg/kg	<0.1	<0.1	<0.1	6.6	0.2
Phenanthrene	mg/kg	1.1	0.6	2.4	25	1.9
Anthracene	mg/kg	<0.1	<0.1	0.2	5.2	0.5
Fluoranthene	mg/kg	0.7	0.2	1.4	20	2.6
Pyrene	mg/kg	0.7	0.2	1.3	16	2.4
Benzo(a)anthracene	mg/kg	0.4	0.1	0.7	6.2	0.9
Chrysene	mg/kg	0.5	0.2	0.7	4.8	0.8
Benzo(b,j+k)fluoranthene	mg/kg	0.7	0.2	0.9	8.5	1
Benzo(a)pyrene	mg/kg	0.4	0.1	0.53	5.6	0.99
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	0.2	2.7	0.5
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.6	0.1
Benzo(g,h,i)perylene	mg/kg	0.3	0.1	0.3	3.1	0.7
Total +ve PAH's	mg/kg	5.5	2.0	8.8	120	14
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	0.7	8.0	1.4
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	<0.5	0.8	8.0	1.4
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	<0.5	0.8	8.0	1.4
Surrogate <i>p</i> -Terphenyl-d14	%	111	110	106	104	102

PAHs in Soil						
Our Reference		370498-11	370498-12	370498-13	370498-14	370498-15
Your Reference	UNITS	TB5A	TB5B	TB5C	TP6A	TP6B
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Naphthalene	mg/kg	0.2	0.3	0.3	0.1	0.6
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.7	1.3	1.6	0.4	1.2
Anthracene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.8	4.9	0.3	0.3	0.9
Pyrene	mg/kg	0.7	5.2	0.3	0.3	0.8
Benzo(a)anthracene	mg/kg	0.4	3.1	0.2	0.2	0.5
Chrysene	mg/kg	0.4	2.8	0.3	0.2	0.5
Benzo(b,j+k)fluoranthene	mg/kg	0.8	5.4	<0.2	0.4	0.8
Benzo(a)pyrene	mg/kg	0.4	2.4	0.1	0.2	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	1.8	<0.1	0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	2.1	<0.1	0.2	0.3
Total +ve PAH's	mg/kg	4.9	30	3.2	2.4	6.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.5	4.0	<0.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.6	4.0	<0.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	4.0	<0.5	<0.5	0.7
Surrogate p-Terphenyl-d14	%	101	98	100	99	100

PAHs in Soil						
Our Reference		370498-16	370498-17	370498-18	370498-19	370498-20
Your Reference	UNITS	TP6C	TP7A	TP7B	TP7C	TP8A
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Naphthalene	mg/kg	0.6	0.5	0.4	1.2	0.5
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	4.3	1.1	1.5	2.3	1.6
Anthracene	mg/kg	0.7	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	4.2	1.0	0.5	0.4	0.4
Pyrene	mg/kg	4.0	1	0.4	0.4	0.4
Benzo(a)anthracene	mg/kg	2.0	0.5	0.3	0.3	0.3
Chrysene	mg/kg	1.9	0.6	0.4	0.4	0.4
Benzo(b,j+k)fluoranthene	mg/kg	3.2	1	0.4	0.3	0.3
Benzo(a)pyrene	mg/kg	2.0	0.5	0.2	0.2	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.8	0.3	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.9	0.4	0.1	<0.1	0.1
Total +ve PAH's	mg/kg	26	7.0	4.1	5.5	4.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.8	0.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.8	0.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.8	0.8	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	101	100	115	117	115

PAHs in Soil						
Our Reference		370498-21	370498-22	370498-23	370498-24	370498-25
Your Reference	UNITS	TP8B	TP8C	TP9A	TP9C	TP10A
Date Sampled		14/01/2025	14/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Naphthalene	mg/kg	0.6	0.6	0.2	1.8	0.2
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.9	1.6	0.4	2.0	2.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.4	0.5	0.6	0.7	0.5
Pyrene	mg/kg	0.4	0.5	0.6	0.6	0.4
Benzo(a)anthracene	mg/kg	0.3	0.3	0.3	0.4	0.3
Chrysene	mg/kg	0.4	0.4	0.3	0.5	0.4
Benzo(b,j+k)fluoranthene	mg/kg	0.3	0.3	0.6	0.6	0.2
Benzo(a)pyrene	mg/kg	0.2	0.2	0.3	0.3	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	0.3	0.2	<0.1
Total +ve PAH's	mg/kg	4.5	4.4	3.7	7.3	4.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.5	0.5	<0.5
Surrogate p-Terphenyl-d14	%	121	115	111	112	114

PAHs in Soil						
Our Reference		370498-26	370498-27	370498-28	370498-29	370498-30
Your Reference	UNITS	TP10B	TP10C	QA1	QA3	TB5A - [TRIPLICATE]
Date Sampled		14/01/2025	14/01/2025	13/01/2025	14/01/2025	13/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Naphthalene	mg/kg	0.8	0.6	0.3	0.5	0.2
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.6
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Phenanthrene	mg/kg	2.0	1.3	0.8	2.8	13
Anthracene	mg/kg	0.1	0.1	0.1	<0.1	3.7
Fluoranthene	mg/kg	0.7	1.0	0.8	0.6	29
Pyrene	mg/kg	0.6	0.9	0.8	0.5	24
Benzo(a)anthracene	mg/kg	0.4	0.5	0.4	0.4	9.1
Chrysene	mg/kg	0.4	0.5	0.4	0.5	7.5
Benzo(b,j+k)fluoranthene	mg/kg	0.5	0.8	0.7	0.3	11
Benzo(a)pyrene	mg/kg	0.2	0.4	0.3	0.2	6.1
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	0.2	0.2	<0.1	3.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.8
Benzo(g,h,i)perylene	mg/kg	0.2	0.3	0.3	<0.1	3.6
Total +ve PAH's	mg/kg	6.0	6.6	5.2	5.8	110
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.6	<0.5	<0.5	9.4
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.6	0.5	<0.5	9.4
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.7	0.6	<0.5	9.4
Surrogate p-Terphenyl-d14	%	114	113	114	113	119

Acid Extractable metals in soil

Our Reference		370498-1	370498-2	370498-3	370498-4	370498-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Date Sampled		13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Arsenic	mg/kg	7	5	8	<4	8
Cadmium	mg/kg	<0.4	<0.8	<0.4	<0.4	0.4
Chromium	mg/kg	150	520	300	760	38
Copper	mg/kg	50	31	23	69	33
Lead	mg/kg	71	78	34	71	25
Mercury	mg/kg	0.4	0.1	<0.1	<0.1	0.3
Nickel	mg/kg	16	26	38	51	23
Zinc	mg/kg	180	120	100	190	79

Acid Extractable metals in soil

Our Reference		370498-6	370498-7	370498-8	370498-9	370498-10
Your Reference	UNITS	TB3B	TB3C	TB4A	TB4B	TB4C
Date Sampled		14/01/2025	14/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Arsenic	mg/kg	11	11	6	6	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	0.9	<0.4
Chromium	mg/kg	110	54	16	420	180
Copper	mg/kg	27	34	20	72	50
Lead	mg/kg	38	35	23	110	75
Mercury	mg/kg	0.2	0.3	0.1	0.2	0.1
Nickel	mg/kg	31	45	7	43	27
Zinc	mg/kg	98	87	61	350	290

Acid Extractable metals in soil

Our Reference		370498-11	370498-12	370498-13	370498-14	370498-15
Your Reference	UNITS	TB5A	TB5B	TB5C	TP6A	TP6B
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Arsenic	mg/kg	7	10	75	10	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	86	130	20	40	160
Copper	mg/kg	26	34	22	23	31
Lead	mg/kg	42	60	20	39	47
Mercury	mg/kg	0.1	0.1	0.7	0.1	0.3
Nickel	mg/kg	20	29	9	10	17
Zinc	mg/kg	110	180	55	94	120

Acid Extractable metals in soil

Our Reference		370498-16	370498-17	370498-18	370498-19	370498-20
Your Reference	UNITS	TP6C	TP7A	TP7B	TP7C	TP8A
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Arsenic	mg/kg	<4	6	17	21	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	<1	260	25	6	33
Copper	mg/kg	<1	29	28	22	17
Lead	mg/kg	<1	44	31	23	21
Mercury	mg/kg	0.3	0.1	0.2	0.4	0.1
Nickel	mg/kg	<1	62	14	10	13
Zinc	mg/kg	<1	120	90	55	42

Acid Extractable metals in soil

Our Reference		370498-21	370498-22	370498-23	370498-24	370498-25
Your Reference	UNITS	TP8B	TP8C	TP9A	TP9C	TP10A
Date Sampled		14/01/2025	14/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Arsenic	mg/kg	12	13	8	16	21
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	6	12	110	110	3
Copper	mg/kg	21	24	27	27	24
Lead	mg/kg	19	23	31	49	17
Mercury	mg/kg	0.2	0.2	0.1	0.2	0.3
Nickel	mg/kg	11	16	16	25	9
Zinc	mg/kg	54	67	80	100	50

Acid Extractable metals in soil

Our Reference		370498-26	370498-27	370498-28	370498-29	370498-30
Your Reference	UNITS	TP10B	TP10C	QA1	QA3	TB5A - [TRIPLICATE]
Date Sampled		14/01/2025	14/01/2025	13/01/2025	14/01/2025	13/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Arsenic	mg/kg	23	5	9	13	8
Cadmium	mg/kg	1	1	<0.4	<0.4	<0.4
Chromium	mg/kg	41	190	62	3	190
Copper	mg/kg	170	110	27	18	43
Lead	mg/kg	71	120	55	15	50
Mercury	mg/kg	0.3	0.8	0.1	0.2	0.1
Nickel	mg/kg	22	20	17	7	20
Zinc	mg/kg	260	200	140	42	110

Acid Extractable metals in soil		
Our Reference	UNITS	370498-31
Your Reference		TP8B - [TRIPLICATE]
Date Sampled		14/01/2025
Type of sample		Soil
Date prepared	-	22/01/2025
Date analysed	-	22/01/2025
Arsenic	mg/kg	29
Cadmium	mg/kg	<0.4
Chromium	mg/kg	7
Copper	mg/kg	20
Lead	mg/kg	19
Mercury	mg/kg	0.3
Nickel	mg/kg	14
Zinc	mg/kg	62

Moisture						
Our Reference	UNITS	370498-1	370498-2	370498-3	370498-4	370498-5
Your Reference		TP1A	TP1B	TP2A	TP2B	TP3A
Date Sampled		13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Moisture	%	18	14	10	8.7	8.4

Moisture						
Our Reference	UNITS	370498-6	370498-7	370498-8	370498-9	370498-10
Your Reference		TB3B	TB3C	TB4A	TB4B	TB4C
Date Sampled		14/01/2025	14/01/2025	14/01/2025	14/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Moisture	%	4.2	8.4	15	14	12

Moisture						
Our Reference	UNITS	370498-11	370498-12	370498-13	370498-14	370498-15
Your Reference		TB5A	TB5B	TB5C	TP6A	TP6B
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Moisture	%	13	13	10	16	10

Moisture						
Our Reference	UNITS	370498-16	370498-17	370498-18	370498-19	370498-20
Your Reference		TP6C	TP7A	TP7B	TP7C	TP8A
Date Sampled		13/01/2025	13/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Moisture	%	9.0	13	9.2	11	9.8

Moisture						
Our Reference	UNITS	370498-21	370498-22	370498-23	370498-24	370498-25
Your Reference		TP8B	TP8C	TP9A	TP9C	TP10A
Date Sampled		14/01/2025	14/01/2025	13/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Moisture	%	8.6	10	13	9.2	7.1

Moisture					
Our Reference		370498-26	370498-27	370498-28	370498-29
Your Reference	UNITS	TP10B	TP10C	QA1	QA3
Date Sampled		14/01/2025	14/01/2025	13/01/2025	14/01/2025
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	21/01/2025	21/01/2025	21/01/2025	21/01/2025
Date analysed	-	22/01/2025	22/01/2025	22/01/2025	22/01/2025
Moisture	%	11	12	13	7.5

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	370498-2
Date extracted	-			21/01/2025	1	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Date analysed	-			22/01/2025	1	22/01/2025	22/01/2025		22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	1	<25	<25	0	90	75
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	1	<25	<25	0	90	75
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	104	80
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	106	90
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	83	70
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	79	68
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	84	73
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	97	1	78	88	12	105	82

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	370498-22
Date extracted	-			[NT]	11	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Date analysed	-			[NT]	11	22/01/2025	22/01/2025		22/01/2025	22/01/2025
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	11	<25	<25	0	95	92
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	11	<25	<25	0	95	92
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	107	110
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	121	109
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	83	83
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	80	79
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	85	85
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	86	110	24	62	101

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	21/01/2025	21/01/2025		[NT]	[NT]
Date analysed	-			[NT]	21	22/01/2025	22/01/2025		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	21	100	109	9	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	370498-2
Date extracted	-			21/01/2025	1	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Date analysed	-			21/01/2025	1	21/01/2025	21/01/2025		21/01/2025	21/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	1	<50	57	13	125	121
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	1	260	270	4	113	#
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	1	260	280	7	114	#
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	1	51	66	26	125	121
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	1	420	440	5	113	#
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	1	220	240	9	114	#
Surrogate o-Terphenyl	%		Org-020	97	1	107	122	13	115	105

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	370498-22
Date extracted	-			[NT]	11	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Date analysed	-			[NT]	11	22/01/2025	22/01/2025		22/01/2025	22/01/2025
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	11	<50	<50	0	125	100
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	11	<100	<100	0	122	93
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	11	<100	<100	0	114	125
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	11	<50	<50	0	125	100
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	11	<100	<100	0	122	93
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	11	<100	<100	0	114	125
Surrogate o-Terphenyl	%		Org-020	[NT]	11	95	87	9	104	117

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	21/01/2025	21/01/2025		[NT]	[NT]
Date analysed	-			[NT]	21	22/01/2025	22/01/2025		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	21	56	56	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	21	260	290	11	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	21	110	140	24	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	21	71	76	7	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	21	310	360	15	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	21	114	128	12	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	370498-2
Date extracted	-			21/01/2025	1	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Date analysed	-			21/01/2025	1	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.3	29	90	#
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	90
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	90
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	0.8	0.6	29	88	#
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	0.7	0.6	15	86	#
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.6	0.6	0	90	#
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.3	29	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.5	0.4	22	84	97
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	0.8	0.8	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.3	0.3	0	82	122
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.3	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.4	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	113	1	111	110	1	101	109

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	370498-22
Date extracted	-			[NT]	11	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Date analysed	-			[NT]	11	21/01/2025	21/01/2025		21/01/2025	21/01/2025
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	0.2	0.3	40	82	79
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	82	82
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	80	80
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	0.7	0.8	13	84	108
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	0.2	67	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	0.8	1.2	40	82	69
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	0.7	1.2	53	86	73
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	0.4	0.6	40	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	0.4	0.6	40	76	67
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	0.8	1	22	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	0.4	0.61	42	76	72
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	0.3	0.4	29	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	0.3	0.5	50	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	101	100	1	108	111

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	21/01/2025	21/01/2025		[NT]	[NT]
Date analysed	-			[NT]	21	21/01/2025	21/01/2025		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	21	0.6	0.5	18	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	21	1.9	2.0	5	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	21	0.4	0.5	22	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	21	0.4	0.4	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	0.3	0.3	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	21	0.4	0.4	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	21	0.3	0.3	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	21	0.2	0.2	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	21	121	119	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	370498-2
Date prepared	-			22/01/2025	1	22/01/2025	22/01/2025		22/01/2025	22/01/2025
Date analysed	-			22/01/2025	1	22/01/2025	22/01/2025		22/01/2025	22/01/2025
Arsenic	mg/kg	4	Metals-020	<4	1	7	6	15	106	81
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	96	###
Chromium	mg/kg	1	Metals-020	<1	1	150	200	29	97	#
Copper	mg/kg	1	Metals-020	<1	1	50	45	11	102	96
Lead	mg/kg	1	Metals-020	<1	1	71	67	6	100	##
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.4	0.2	67	115	105
Nickel	mg/kg	1	Metals-020	<1	1	16	19	17	98	##
Zinc	mg/kg	1	Metals-020	<1	1	180	210	15	95	##

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	370498-22
Date prepared	-			[NT]	11	22/01/2025	22/01/2025		22/01/2025	22/01/2025
Date analysed	-			[NT]	11	22/01/2025	22/01/2025		22/01/2025	22/01/2025
Arsenic	mg/kg	4	Metals-020	[NT]	11	7	7	0	108	96
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	97	89
Chromium	mg/kg	1	Metals-020	[NT]	11	86	93	8	100	90
Copper	mg/kg	1	Metals-020	[NT]	11	26	66	87	111	107
Lead	mg/kg	1	Metals-020	[NT]	11	42	60	35	102	95
Mercury	mg/kg	0.1	Metals-021	[NT]	11	0.1	0.1	0	129	124
Nickel	mg/kg	1	Metals-020	[NT]	11	20	17	16	100	91
Zinc	mg/kg	1	Metals-020	[NT]	11	110	120	9	95	77

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	22/01/2025	22/01/2025		[NT]	[NT]
Date analysed	-			[NT]	21	22/01/2025	22/01/2025		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	12	12	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	6	10	50	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	21	19	10	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	19	18	5	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	0.2	0.2	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	11	11	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	54	51	6	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

PAHs in Soil - # Percent recovery for the surrogate/matrix spike is not possible to report as the high concentration of analytes in sample/s 370498-2ms have caused interference.

PAHs in Soil - The laboratory RPD acceptance criteria has been exceeded for 370498-11. Therefore a triplicate result has been issued as laboratory sample number 370498-30.

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate/matrix spike is not possible to report as the high concentration of analytes in sample/s 370498-20,25,29 have caused interference.

Acid Extractable Metals in Soil:

-The laboratory RPD acceptance criteria has been exceeded for 370498-11 for Cu. Therefore a triplicate result has been issued as laboratory sample number 370498-30.

-The laboratory RPD acceptance criteria has been exceeded for 370498-21 for Cr. Therefore a triplicate result has been issued as laboratory sample number 370498-31.

-# Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

-## Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

-### Poor spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS.

-The PQL(s) for 370498-2 has been raised for Cd due to the low spike recovery/recoveries. This may reflect other samples where similar in matrix and similar analytical interferences occur.

CHAIN OF CUSTODY - Client



ENVIROLAB GROUP

Company:	RCA Australia		RCA Reference Number (i.e. report title)		ENVIROLAB GROUP Sydney Lab - Envirolab Services 12 Ashley St, Chatswood, NSW 2067 02 9910 6200 sydney@envirolab.com.au
Contact person:	Fiona Brooker		17466		
Project Mgr:	Fiona Brooker		PO No. (if applicable):	Not applicable	
Sampler:	Stephen Hendriksen		Envirolab Quote No.:	BM8	
Address:	92 Hill St Carrington, NSW 2294		Date results required:	22/01/2025	
Phone:	02 4902 9200	Mob:	0466 571 694		
Email results to:	administrator@rca.com.au + enviro@rca.com.au		Lab comments:		
Email invoice to:					

Sample Information					Tests Required										Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	# Containers	Combo 3 TRH/BTEX/PAH/8 Metals										Provide as much information about the sample as you can
1	TP1A	13/01/2025	soil	1 250mL UG	x										
2	TP1B	13/01/2025	soil	1 250mL UG	x										
3	TP2A	14/01/2025	soil	1 250mL UG	x										
4	TP2B	14/01/2025	soil	1 250mL UG	x										
	TP2C	14/01/2025	soil	1 250mL UG	x										
5	TP3A	14/01/2025	soil	1 250mL UG	x										
6	TP3B	14/01/2025	soil	1 250mL UG	x										
7	TP3C	14/01/2025	soil	1 250mL UG	x										
8	TP4A	14/01/2025	soil	1 250mL UG	x										
9	TP4B	14/01/2025	soil	1 250mL UG	x										
10	TP4C	14/01/2025	soil	1 250mL UG	x										
	TP4D	14/01/2025	soil	1 250mL UG	x										
11	TP5A	13/05/2025	soil	1 250mL UG	x										
12	TP5B	13/01/2025	soil	1 250mL UG	x										
13	TP5C	13/01/2025	soil	1 250mL UG	x										
Total				15	15	0	0	0	0	0	0	0	0	0	

Relinquished by (company):	RCA Australia	Received by (company):	Envirolab	Lab use only:	
Print Name:	S. Hendriksen	Print Name:	Lauren Schotter	Lab Number	Cooling: Ice / Ice Pack / None
Date & Time:	15/1/25	Date & Time:	15/1/2025 10:12	Temperature	5.3°C
Signature:		Signature:		Security Seal:	Intact / Broken / Not Used
				TAT Req:	SAME DAY / 1 / 2 / 3 / 4 / STD

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP



Company:	RCA Australia		RCA Reference Number (i.e. report title)		ENVIROLAB GROUP Sydney Lab - Envirolab Services 12 Ashley St, Chatswood, NSW 2067 02 9910 6200 sydney@envirolab.com.au
Contact person:	Fiona Brooker		17466		
Project Mgr:	Fiona Brooker		PO No. (if applicable):	Not applicable	
Sampler:	Stephen Hendriksen		Envirolab Quote No. :	BM8	
Address:	92 Hill St Carrington, NSW 2294		Date results required:	22/01/2025	
Phone:	02 4902 9200	Mob:	0466 571 694		
Email results to:	administrator@rca.com.au + enviro@rca.com.au		Note: Inform lab in advance if urgent turnaround is required - surcharge applies		
Email invoice to:			Lab comments:		

Sample Information				Tests Required												Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	# Containers	Combo 3 TRH/BTEX/PAH/8 Metals											Provide as much information about the sample as you can
14	TP6A	13/01/2025	soil	1 250mL UG	x											
15	TP6B	13/01/2025	soil	1 250mL UG	x											
16	TP6C	13/01/2025	soil	1 250mL UG	x											
17	TP7A	13/01/2025	soil	1 250mL UG	x											
18	TP7B	13/01/2025	soil	1 250mL UG	x											
19	TP7C	13/01/2025	soil	1 250mL UG	x											
20	TP8A	14/01/2025	soil	1 250mL UG	x											
21	TP8B	14/01/2024	soil	1 250mL UG	x											
22	TP8C	14/01/2025	soil	1 250mL UG	x											
23	TP9A	13/01/2025	soil	1 250mL UG	x											
	TP9B	13/01/2025	soil	1 250mL UG	x											
24	TP9C	13/01/2025	soil	1 250mL UG	x											
25	TP10A	14/01/2025	soil	1 250mL UG	x											
26	TP10B	14/01/2025	soil	1 250mL UG	x											
27	TP10C	14/01/2025	soil	1 250mL UG	x											
28	QA1	13/01/2025	soil	1 250mL UG	x											
29	QA3	14/01/2025	soil	1 250mL UG	x											
Total				17	17	0	0	0	0	0	0	0	0	0	0	

Relinquished by (company):	RCA Australia	Received by (company):	Envirolab	Lab use only:	
Print Name:	S. Hendriksen	Print Name:	Laura Brooker	Job Number	Cooling: Ice / Ice Pack / None
Date & Time:	15/1/25	Date & Time:	15/1/2025	Temperature	53
Signature:	[Signature]	Signature:	[Signature]	Security Seal:	Intact / Broken / Not Used
				TAT Req:	SAME DAY / 1 / 2 / 3 / 4 / STD

SAMPLE RECEIPT ADVICE

Client Details

Client	RCA Australia
Attention	Fiona Brooker

Sample Login Details

Your reference	17466
Envirolab Reference	370498
Date Sample Received	16/01/2025
Date Instructions Received	16/01/2025
Date Results Expected to be Reported	22/01/2025

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	29 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11
Cooling Method	Ice
Sampling Date Provided	YES

Comments

TP2c, TP4D and TP9B received broken in transit and unable to be recovered.

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metals in soil
TP1A	✓	✓	✓	✓
TP1B	✓	✓	✓	✓
TP2A	✓	✓	✓	✓
TP2B	✓	✓	✓	✓
TP3A	✓	✓	✓	✓
TB3B	✓	✓	✓	✓
TB3C	✓	✓	✓	✓
TB4A	✓	✓	✓	✓
TB4B	✓	✓	✓	✓
TB4C	✓	✓	✓	✓
TB5A	✓	✓	✓	✓
TB5B	✓	✓	✓	✓
TB5C	✓	✓	✓	✓
TP6A	✓	✓	✓	✓
TP6B	✓	✓	✓	✓
TP6C	✓	✓	✓	✓
TP7A	✓	✓	✓	✓
TP7B	✓	✓	✓	✓
TP7C	✓	✓	✓	✓
TP8A	✓	✓	✓	✓
TP8B	✓	✓	✓	✓
TP8C	✓	✓	✓	✓
TP9A	✓	✓	✓	✓
TP9C	✓	✓	✓	✓
TP10A	✓	✓	✓	✓
TP10B	✓	✓	✓	✓
TP10C	✓	✓	✓	✓
QA1	✓	✓	✓	✓
QA3	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.



CERTIFICATE OF ANALYSIS

Work Order : **ES2500862**
Client : **ROBERT CARR & ASSOCIATES P/L**
Contact : MS FIONA BROOKER
Address : 92 HILL STREET
CARRINGTON NSW 2294
Telephone : +61 02 4902 9200
Project : 17466
Order number : ----
C-O-C number : ----
Sampler : Stephen Hendriksen
Site : ----
Quote number : NSW Custom BQ 2024
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Danae Hambly
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 15-Jan-2025 09:40
Date Analysis Commenced : 16-Jan-2025
Issue Date : 22-Jan-2025 17:43



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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
- Surrogate Control Limits

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
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080: Batch ES2500862-1 result has been confirmed by re-analysis.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	qQA2	----	----	----	----
Sampling date / time				14-Jan-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2500862-001	-----	-----	-----	-----
Result				----	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	9.2	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	22	----	----	----	----
Copper	7440-50-8	5	mg/kg	16	----	----	----	----
Lead	7439-92-1	5	mg/kg	18	----	----	----	----
Nickel	7440-02-0	2	mg/kg	12	----	----	----	----
Zinc	7440-66-6	5	mg/kg	48	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	1.1	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	3.9	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	1.0	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	0.9	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	0.6	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	0.8	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	qQA2	----	----	----	----
Sampling date / time					14-Jan-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2500862-001	-----	-----	-----	-----
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	-----	0.5	mg/kg		8.3	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	-----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	-----	0.5	mg/kg		0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	-----	0.5	mg/kg		1.2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	-----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	-----	50	mg/kg		50	----	----	----	----
C15 - C28 Fraction	-----	100	mg/kg		610	----	----	----	----
C29 - C36 Fraction	-----	100	mg/kg		270	----	----	----	----
^ C10 - C36 Fraction (sum)	-----	50	mg/kg		930	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	-----	50	mg/kg		100	----	----	----	----
>C16 - C34 Fraction	-----	100	mg/kg		750	----	----	----	----
>C34 - C40 Fraction	-----	100	mg/kg		150	----	----	----	----
^ >C10 - C40 Fraction (sum)	-----	50	mg/kg		1000	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	-----	50	mg/kg		100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	-----	0.2	mg/kg		<0.2	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	qQA2	----	----	----	----
Sampling date / time					14-Jan-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2500862-001	-----	-----	-----	-----
					Result	----	----	----	----
EP080: BTEXN - Continued									
^ Total Xylenes				0.5	mg/kg	<0.5	----	----	----
Naphthalene				91-20-3	1	mg/kg	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6				13127-88-3	0.5	%	85.2	----	----
2-Chlorophenol-D4				93951-73-6	0.5	%	82.1	----	----
2,4,6-Tribromophenol				118-79-6	0.5	%	67.7	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl				321-60-8	0.5	%	95.9	----	----
Anthracene-d10				1719-06-8	0.5	%	88.1	----	----
4-Terphenyl-d14				1718-51-0	0.5	%	86.3	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4				17060-07-0	0.2	%	80.6	----	----
Toluene-D8				2037-26-5	0.2	%	79.4	----	----
4-Bromofluorobenzene				460-00-4	0.2	%	81.4	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131



QUALITY CONTROL REPORT

Work Order : **ES2500862**

Page : 1 of 7

Client : **ROBERT CARR & ASSOCIATES P/L**

Laboratory : Environmental Division Sydney

Contact : MS FIONA BROOKER

Contact : Danae Hambly

Address : 92 HILL STREET
CARRINGTON NSW 2294

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 02 4902 9200

Telephone : +61-2-8784 8555

Project : 17466

Date Samples Received : 15-Jan-2025

Order number : ----

Date Analysis Commenced : 16-Jan-2025

C-O-C number : ----

Issue Date : 22-Jan-2025

Sampler : Stephen Hendriksen

Site : ----

Quote number : NSW Custom BQ 2024

No. of samples received : 1

No. of samples analysed : 1



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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 Quality Control Report contains the following information:

- 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

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
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



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**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6320355)									
ES2500857-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	78	64	19.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	18	14	24.7	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	15	14.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	6	7	0.0	No Limit
ES2500951-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	10	11.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	16	12	26.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	12	12	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	30	26	14.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	16	12.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	76	59	25.1	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6320363)									
EN2500726-002	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	11.4	11.8	3.5	0% - 50%
ES2500857-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	17.2	14.7	15.9	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6320356)									
ES2500857-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2500951-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6313767)									
ES2500952-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6313768)							
ES2500952-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	240	270	14.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	550	370	38.4	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6314605)									
ES2500506-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2500506-022	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6313768)									
ES2500952-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	500	440	13.3	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	480	440	8.4	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6314605)									
ES2500506-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2500506-022	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 6314605)									
ES2500506-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Page : 4 of 7
 Work Order : ES2500862
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 17466



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 6314605) - continued									
ES2500506-002	Anonymous	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2500506-022	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6320355)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	96.8	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	82.2	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	106	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	96.1	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	89.9	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	90.4	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	87.3	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6320356)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	95.8	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6313767)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	95.9	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	92.5	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	97.8	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	101	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	99.5	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	96.3	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	98.9	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	99.8	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	90.8	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	99.0	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	90.4	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	101	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	91.1	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	88.7	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	95.1	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	89.3	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6313768)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	95.1	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	90.3	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	93.1	71.0	129



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6314605)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	109	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6313768)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	92.0	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	91.4	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	98.6	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6314605)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	110	72.4	133
EP080: BTEXN (QCLot: 6314605)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	107	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	118	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	119	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	113	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	105	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	100	78.8	122

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				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6320355)							
ES2500857-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	85.9	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	85.5	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	90.3	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	95.8	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	89.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	88.3	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	89.7	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6320356)							
ES2500857-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	71.9	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6313767)							
ES2500952-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	98.5	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.6	70.0	130

Page : 7 of 7
 Work Order : ES2500862
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 17466



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6313768)							
ES2500952-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	107	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	91.6	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	83.6	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6314605)							
ES2500506-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	82.2	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6313768)							
ES2500952-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	96.2	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	88.5	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	82.4	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6314605)							
ES2500506-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.4	61.1	142
EP080: BTEXN (QCLot: 6314605)							
ES2500506-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	107	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	92.9	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	96.6	67.4	123
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	96.3	66.4	121
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.7	70.7	121
	EP080: Naphthalene	91-20-3	2.5 mg/kg	85.4	61.1	115	



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2500862	Page	: 1 of 4
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555
Project	: 17466	Date Samples Received	: 15-Jan-2025
Site	: ----	Issue Date	: 22-Jan-2025
Sampler	: Stephen Hendriksen	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

- **NO** Quality Control Sample Frequency Outliers exist.



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 VOC in soils 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 or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / 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) qQA2	14-Jan-2025	----	----	----	20-Jan-2025	28-Jan-2025	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) qQA2	14-Jan-2025	20-Jan-2025	13-Jul-2025	✓	21-Jan-2025	13-Jul-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) qQA2	14-Jan-2025	20-Jan-2025	11-Feb-2025	✓	21-Jan-2025	11-Feb-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) qQA2	14-Jan-2025	16-Jan-2025	28-Jan-2025	✓	20-Jan-2025	25-Feb-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) qQA2	14-Jan-2025	16-Jan-2025	28-Jan-2025	✓	17-Jan-2025	28-Jan-2025	✓
Soil Glass Jar - Unpreserved (EP071) qQA2	14-Jan-2025	16-Jan-2025	28-Jan-2025	✓	21-Jan-2025	25-Feb-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) qQA2	14-Jan-2025	16-Jan-2025	28-Jan-2025	✓	17-Jan-2025	28-Jan-2025	✓
Soil Glass Jar - Unpreserved (EP071) qQA2	14-Jan-2025	16-Jan-2025	28-Jan-2025	✓	21-Jan-2025	25-Feb-2025	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) qQA2	14-Jan-2025	16-Jan-2025	28-Jan-2025	✓	17-Jan-2025	28-Jan-2025	✓



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: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	4	25.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	25.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



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)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

CHAIN OF CUSTODY

ALS Laboratory:
please click →

ADALDAIDE 24 Gurnea Road Portiroke SA 5095
Ph: 08 8359 0690 F: adaldaide@calglobal.com

BRISBANE 32 Shand Street Stafford QLD 4055
Ph: 07 3214 7722 E: samples@brisbane-sciencelab.com

OSGLADSTONE 48 Colleenandah Drive Olinda QLD 4560
Ph: 07 7471 5900 E: placostone@placostone.com

UMACKAY 76 Herdair Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@aircabel.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9100 E: samples.melbourne@telstra.com

DMUDGE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mpa@ahc.nsw.gov.au

ONEWCASTLE 5/585 Meiland Rd Mayfield West NSW 2904
Ph: 02 4914 2500 E: samples.newcastle@teleglobal.com

QINOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024403 2052 E: nwra@salesglobal.com

PERTH 10 Rod Way Malaga WA 6000
Ph: 08 9396 7665 E: enquiries.perth@olegial.net.au

QSYDNEY 277-200 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8566 E: samplesydney@siacphal.com

QTOWNSVILLE 14-15 Deakin Court Bohle QLD 4318
Ph: 07 4763 5500 E: jawonella.environmental@btinternet.com

EWELLONGONG 89 Kerby Street Wollongong NSW 2500
Ph: 02 4225 2125 E: north@noble.com.au

CLIENT: RCA Australia (ROBCAR)		TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)		☐ Standard TAT (List due date): 22/1/25 ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY: (Circle)	
OFFICE: 92 Hill Street, Carrington						Custody Seal Intact? Yes No ☒ N/A	
RCA Ref No: 17466		ALS QUOTE NO.: EN/22/24		COC SEQUENCE NUMBER (Circle)		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
				COC: 1 2 3 4 5 6 7		Random Sample Temperature on Receipt: 10 °C	
				OF: 1 2 3 4 5 6 7		Other comment:	
PROJECT MANAGER: Fiona Brooker		CONTACT PH: 0408 687 529					
SAMPLER: Stephen Hendriksen		SAMPLER MOBILE: 0466 571 694		RELINQUISHED BY: SH		RECEIVED BY: CM	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):		DATE/TIME: 15/1/25		DATE/TIME: 15/01	
Email Reports to: administrator@rca.com.au + enviro@rca.com.au						DATE/TIME: 1700	
Email Invoice to: as above						DATE/TIME: 15/1/25 19:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

[illegible]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Specialiation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2500862**

Client : **ROBERT CARR & ASSOCIATES P/L**
Contact : **MS FIONA BROOKER**
Address : **92 HILL STREET**
CARRINGTON NSW 2294

E-mail : **fionab@rca.com.au**
Telephone : **+61 02 4902 9200**
Facsimile : **+61 02 4902 9299**

Project : **17466**
Order number : **----**

C-O-C number : **----**
Site : **----**
Sampler : **Stephen Hendriksen**

Laboratory : **Environmental Division Sydney**
Contact : **Danae Hambly**
Address : **277-289 Woodpark Road Smithfield**
NSW Australia 2164

E-mail : **danae.hambly@alsglobal.com**
Telephone : **+61-2-8784 8555**
Facsimile : **+61-2-8784 8500**

Page : **1 of 2**
Quote number : **EN2023ROBCAR0002 (NSW Custom**
BQ 2024)
QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **15-Jan-2025 09:40**
Client Requested Due : **22-Jan-2025**
Date

Issue Date : **15-Jan-2025**
Scheduled Reporting Date : **22-Jan-2025**

Delivery Details

Mode of Delivery : **Undefined**
No. of coolers/boxes : **1**
Receipt Detail :

Security Seal : **Not Available**
Temperature : **1 - Ice present**
No. of samples received / analysed : **1 / 1**

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- 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 $\pm$ 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.



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 laboratory and displayed in brackets without a time component

Matrix: SOIL

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2500862-001	14-Jan-2025 00:00	qQA2	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ADMINISTRATOR

- *AU Certificate of Analysis - NATA (COA)	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au

ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
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ENVIRO

- *AU Certificate of Analysis - NATA (COA)	Email	enviro@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	enviro@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au

FIONA BROOKER

- *AU Certificate of Analysis - NATA (COA)	Email	fionab@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	fionab@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au

Appendix H

Summary of Results

Sample Identification	Sample Depth (m) ^B	Date	Sample Profile	Dominant Stratum ^C	PID (ppm)	Sample Purpose	Sample Collected by	Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	Benzene	Toluene	Ethylbenzene	meta- and para-Xylene	ortho-Xylene	Total Xylenes	Polycyclic Aromatic Hydrocarbons (PAH)	Naphthalene	Total Recoverable Hydrocarbons (TRH)	TRH C ₆ -C ₁₀	TRH >C ₁₀ -C ₁₆	TRH >C ₁₆ -C ₃₄	TRH >C ₃₄ -C ₄₀	F1	F2				
Guideline ^A							HSL 'D'		SAND 0-<1m	3	NL	NL				230		NL				260	NL				
									SAND 1-<2m	3	NL	NL				NL		NL								370	NL
							ESL C&I		Coarse	75	135	165				180		370		170	1700	3300	215				
									Fine	95	135	185				95		370		170	2500	6600	215				
							Non-sensitive ML		Coarse										700	1000	3500	10000					
									Fine										800	1000	5000	10000					
							DC D																				
PQL									430	99000	27000			81000		11000		26000	20000	27000	38000						
									0.2	0.5	1	2	1	3		1		25	50	100	100	25	50				
TP1A	0.1	13/1/25	FILL, (CWR), Silty Sandy GRAVEL fine to coarse, angular, dark brown, with cobbles ~200mm	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	51	420	220	<25	50.5						
TP1B	1.0	13/1/25	FILL, (CWR), comprising GRAVEL and COBBLES, dark grey/black, angular	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	71	600	240	<25	70.5						
TP2A	0.1	14/1/25	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black/brown	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	110	<100	<25	<50						
TP2B	1.0	14/1/25	FILL, (CWR), comprising coarse GRAVEL and COBBLES	SAND	8.5	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<u>270</u>	640	120	<25	269.5						
TP3A	0.1	14/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown, with some cobbles	SAND	2.3	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	57	260	<100	<25	56.5						
TP3B	1.0	14/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	190	<100	<25	<50						
TP3C	1.7	14/1/25	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, dark grey/ black	SAND	1.7	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	<100	<100	<25	<50						
TP4A	0.1	14/1/25	FILL, Topsoil / CWR Silty Sandy GRAVEL, fine to coarse, black	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	54	240	<100	<25	53.5						
TP4B	1.0	14/1/25	FILL, Topsoil / CWR Silty Sandy GRAVEL, fine to coarse, black	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	97	480	110	<25	96.5						
TP4C	1.3	14/1/25	FILL, (CWR), Silty Clayey Sandy GRAVEL, fine to coarse, black / purple brown	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	<100	<100	<25	<50						
TP5A	0.1	13/1/25	FILL, Silty Sandy Clayey GRAVEL, fine to medium, angular, light brown, occasional cobbles ~100-200mm	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	<100	<100	<25	<50						
TP5B	1.0	13/1/25	FILL, Silty Sandy GRAVEL, fine to medium, angular, light brown	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	140	<100	<25	<50						
TP5C	2.0	13/1/25	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	59	240	<100	<25	58.5						
TP6A	0.1	13/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, dark brown	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	<100	<100	<25	<50						
TP6B	1.0	13/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	200	<100	<25	<50						
TP6C	2.0	13/1/25	FILL, (CWR), Sandy Silty GRAVEL, fine to coarse, dark grey/ black	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	75	440	<100	<25	74.5						
TP7A	0.1	13/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	120	<100	<25	<50						
TP7B	1.0	13/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	100	490	160	<25	99.5						
TP7C	2.0	13/1/25	FILL, (CWR), Sandy Silty GRAVEL, fine to coarse, black	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	88	280	<100	<25	87.5						
TP8A	0.1	14/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, angular, brown, with trace of CWR	SAND	0	Characterisation	RCA - SH		<0.2	<0.5	<1	<2	<1	1.5	<1	<25	100	750	150	<25	99.5						
TP8B	1.0	14/1/25	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	SAND	0	Characterisation	RCA - SH	<0.2	<0.5	<1	<2	<1	1.5	<1	<25	71	310	<100	<25	70.5							
TP8C	2	14/1/25	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	SAND	0	Characterisation	RCA - SH	<0.2	<0.5	<1	<2	<1	1.5	<1	<25	65	280	<100	<25	64.5							
TP9A	0.1	13/1/25	FILL, Silty Clayey Sandy GRAVEL, fine to coarse, brown	SAND	0	Characterisation	RCA - SH	<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	<100	<100	<25	<50							
TP9C	2	13/1/25	FILL, (CWR), Silty Sandy Clayey GRAVEL, fine to coarse, dark grey/black	SAND	0	Characterisation	RCA - SH	<0.2	<0.5	<1	<2	<1	1.5	<1	<25	68	230	<100	<25	67.5							
TP10A	0.1	14/1/25	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	SAND	0	Characterisation	RCA - SH	<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<u>180</u>	780	210	<25	179.5							
TP10B	1	14/1/25	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	SAND	0.2	Characterisation	RCA - SH	<0.2	<0.5	<1	<2	<1	1.5	<1	<25	110	510	160	<25	109.5							
TP10C	1.4	14/1/25	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light brown	SAND	0.1	Characterisation	RCA - SH	<0.2	<0.5	<1	<2	<1	1.5	<1	<25	<50	<100	<100	<25	<50							

All results are in units of mg/ Blank Cell indicates no criterion available

Results for TRH have been compared to TPH guidelines.

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

Presented ESL for naphthalene is an Ecological Investigation Level

F1 = TRH C₆-C₁₀ minus BTEX. F1 PQL deemed equal TRH C₆-C₁₀

ESL are applicable for material at less than 2m depths below finished surface/ground level

F2 = TRH >C₁₀-C₁₆ minus naphthalene. F2 PQL deemed = TRH >C₁₀-C₁₆.

For the purpose of the Tier 1 ESL/EIL assessment, all background concentrations are assumed to be zero

ESL for TRH >C₁₆-C₃₄ and >C₃₄-C₄₀ are low reliability

^A ASC NEPM 1999 (amended April 2013) Vapour Based Health Screening Levels (HSL) 'D' (Commercial/Industrial)

Results shown in **BOLD** are in excess of the vapour based HSL

^A ASC NEPM 1999 (amended April 2013) Ecological Screening Levels (ESL) C&I (Commercial and Industrial)

Results shown in shading are >250% of the vapour based HSL

^A ASC NEPM 1999 (amended April 2013) Management Limits (ML) Non-Sensitive Sites (Commercial and Industrial)

Results shown in underline are in excess of the ESL

^A CRC Care Technical Report 10, September 2011 Direct Contact (DC) Health Screening Levels 'D' (Commercial/Industrial)

Results shown in *italics* are in excess of the management limit

^B Start of sample, refer to logs for sample interval

Results shown in patterned cells are in excess of the direct contact HSL

^C Note that this is a generalisation for the purpose of comparing to the HSL criteria. Where two strata equally represented, most conservative criterion used

Where summation required (Xylene, F1, F2) calculation includes components reported as non detected as 1/2 PQL.

NL designates 'Not Limiting' indicating that the pore water concentration required to constitute a vapour risk is higher than the solubility capacity for that compound based on a petroleum mixture. Vapour is therefore not a risk for this compound.

Sample Identification	PQL	Guideline ^A		TP1A	TP1B	TP2A	TP2B	TP3A	TP3B	TP3C	TP4A	TP4B
Sample Depth (m) ^B		HIL 'D'	EIL C&I	0.1	1.0	0.1	1.0	0.1	1.0	1.7	0.1	1.0
Date				13/1/25	13/1/25	14/01/2025	14/01/2025	14/01/2026	14/01/2027	14/01/2028	14/01/2025	14/01/2025
Sample Profile				FILL, (CWR), Silty Sandy GRAVEL fine to coarse, angular, dark brown, with cobbles ~200mm	FILL, (CWR), comprising GRAVEL and COBBLES, dark grey/black, angular	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black/brown	FILL, (CWR), comprising coarse GRAVEL and COBBLES	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown, with some cobbles	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, dark grey/ black	FILL, Topsoil / CWR Silty Sandy GRAVEL, fine to coarse, black	FILL, Topsoil / CWR Silty Sandy GRAVEL, fine to coarse, black
Sample Purpose				Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation
Sample collected by				RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH
Polycyclic Aromatic Hydrocarbons (PAH)												
Naphthalene	0.1		370	0.4	1.1	0.9	0.4	0.8	0.4	0.2	0.3	15
Acenaphthylene	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	3.3
Acenaphthene	0.1			<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.7
Fluorene	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	6.6
Phenanthrene	0.1			0.8	1.5	1	2.1	1.5	1.1	0.6	2.4	25
Anthracene	0.1			<0.1	0.4	<0.1	0.4	<0.1	<0.1	<0.1	0.2	5.2
Fluoranthene	0.1			0.7	3.3	0.4	2.7	0.5	0.7	0.2	1.4	20
Pyrene	0.1			0.6	3.1	0.4	2.5	0.5	0.7	0.2	1.3	16
Benz(a)anthracene	0.1			0.4	1.3	0.2	1.2	0.3	0.4	0.1	0.7	6.2
Chrysene	0.1			0.5	1.3	0.3	1.1	0.4	0.5	0.2	0.7	4.8
Benzo(b)&(j)&(k)fluoranthene	0.2			0.8	2.4	0.4	2	0.4	0.7	0.2	0.9	8.5
Benzo(a) pyrene	0.05		1.4	0.3	1.4	0.2	0.82	0.2	0.4	0.1	0.53	5.6
Indeno(1,2,3-c,d)pyrene	0.1			0.3	0.9	<0.1	0.4	<0.1	0.2	<0.1	0.2	2.7
Dibenz(a,h)anthracene	0.1			<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.6
Benzo(g,h,i)perylene	0.1			0.4	1.1	0.1	0.4	0.2	0.3	0.1	0.3	3.1
Carcinogenic PAH (B(a)P equivalent)	0.192	40		0.509	1.984	0.319	1.295	0.331	0.588	0.188	0.77	8.019
Sum of reported PAH	1.55	4000		5.45	18.1	4.2	14.32	5.1	5.65	2.2	9.13	123.3
Metals												
Arsenic	4	3000	160	7	5	8	<4	8	11	11	6	6
Cadmium*	0.8	900		<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	0.9
Chromium	1	3600	310	150	520	300	760	38	110	54	16	420
Copper	1	240000	400	50	31	23	69	33	27	34	20	72
Lead	1	1500	1800	71	78	34	71	25	38	35	23	110
Mercury	0.1	730		0.4	0.1	<0.1	<0.1	0.3	0.2	0.3	0.1	0.2
Nickel	1	6000	55	16	26	38	51	23	31	45	7	43
Zinc	1	400000	360	180	120	100	190	79	98	87	61	350

All results are in units of mg/kg.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

^A ASC NEPM 1999 (amended April 2013) Health Investigation Levels (HIL)
'D' (Commercial/Industrial).

^A ASC NEPM 1999 (amended April 2013) Ecological Investigation Levels (EIL)
C&I (Commercial and Industrial).

^B Start of sample, refer to logs for sample interval

The Carcinogenic PAH value is calculated by multiplying the concentration of each of the 8 carcinogenic PAH compounds by its B(a)P toxic equivalence factor and summing these products.

Where summation required (PAH) calculation includes components reported as non detected as 1/2 PQL.

HIL for Chromium are for Chromium VI

Presented ecological value for benzo(a)pyrene is a low reliability Ecological Screening Level

ESL are applicable for material at less than 2m depths below finished surface/ground level

For the purpose of the Tier 1 ESL/EIL assessment, all background concentrations are assumed to be zero

EIL for Naphthalene are for fresh (<2years) Naphthalene

EIL for Arsenic are for aged (>2years) Arsenic

EIL for Chromium are the added contaminant limit for aged (>2years) Chromium III in soils of 1% clay, the most conservative of the criteria

EIL for Copper are the added contaminant limit for aged (>2years) Copper in soils of pH 6.5

EIL for Lead are the added contaminant limit for aged (>2years) Lead

EIL for Nickel are the added contaminant limit for aged (>2years) Nickel in soils of 5% CEC the most conservative of the criteria

EIL for Zinc are the added contaminant limit for aged (>2years) Zinc in soils of 5% CEC and pH of 6.5, the most conservative of the criteria at pH 6.5

Results shown in **BOLD** are in excess of the HIL

Results shown in shading are >250% of the HIL

Results shown in underline are in excess of EIL

* The PQL for Cd has been adjusted to 0.8 for all samples to address any uncertainty due to low spike recovery in TP1B

Sample Identification	PQL	Guideline ^A		TP4C	TP5A	TP5B	TP5C	TP6A	TP6B	TP6C	TP7A	TP7B
Sample Depth (m) ^B		HIL 'D'	EIL C&I	1.3	0.1	1.0	2.0	0.1	1.0	2.0	0.1	1.0
Date				14/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025
Sample Profile				FILL, (CWR), Silty Clayey Sandy GRAVEL, fine to coarse, black / purple brown	FILL, Silty Sandy Clayey GRAVEL, fine to medium, angular, light brown, occasional cobbles ~100-200mm	FILL, Silty Sandy GRAVEL, fine to medium, angular, light brown	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, Silty Sandy GRAVEL, fine to coarse, dark brown	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey	FILL, (CWR), Sandy Silty GRAVEL, fine to coarse, dark grey/ black	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown
Sample Purpose				Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation
Sample collected by				RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH
Polycyclic Aromatic Hydrocarbons (PAH)												
				[^]				#				
Naphthalene	0.1		370	0.7	0.2	0.3	0.3	0.3	0.6	0.6	0.5	0.4
Acenaphthylene	0.1			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1			0.3	0.6	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1
Fluorene	0.1			0.2	0.4	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1
Phenanthrene	0.1			1.9	13	1.3	1.6	0.8	1.2	4.3	1.1	1.5
Anthracene	0.1			0.5	3.7	0.3	<0.1	0.1	<0.1	0.7	0.1	<0.1
Fluoranthene	0.1			2.6	29	4.9	0.3	0.8	0.9	4.2	1	0.5
Pyrene	0.1			2.4	24	5.2	0.3	0.8	0.8	4	1	0.4
Benz(a)anthracene	0.1			0.9	9.1	3.1	0.2	0.4	0.5	2	0.5	0.3
Chrysene	0.1			0.8	7.5	2.8	0.3	0.4	0.5	1.9	0.6	0.4
Benzo(b)&(j)&(k)fluoranthene	0.2			1	11	5.4	<0.2	0.7	0.8	3.2	1	0.4
Benzo(a) pyrene	0.05		1.4	0.99	<u>6.1</u>	<u>2.4</u>	0.1	0.3	0.4	<u>2</u>	0.5	0.2
Indeno(1,2,3-c,d)pyrene	0.1			0.5	3.2	1.8	<0.1	0.2	0.2	0.8	0.3	<0.1
Dibenz(a,h)anthracene	0.1			0.1	0.8	0.5	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(g,h,i)perylene	0.1			0.7	3.6	2.1	<0.1	0.3	0.3	0.9	0.4	0.1
Carcinogenic PAH (B(a)P equivalent)	0.192	40		1.345	9.341	3.979	0.1885	0.487	0.608	2.828	0.74	0.33
Sum of reported PAH	1.55	4000		13.69	112.25	30.25	3.55	5.3	6.45	25.55	7.2	4.5
Metals												
Arsenic	4	3000	160	10	7	10	75	10	10	<4	6	17
Cadmium*	0.8	900		<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chromium	1	3600	310	180	190	130	20	40	160	<1	260	25
Copper	1	240000	400	50	43	34	22	23	31	<1	29	28
Lead	1	1500	1800	75	42	60	20	39	47	<1	44	31
Mercury	0.1	730		0.1	0.1	0.1	0.7	0.1	0.3	0.3	0.1	0.2
Nickel	1	6000	55	27	20	29	9	10	17	<1	<u>62</u>	14
Zinc	1	400000	360	290	110	180	55	94	120	<1	120	90

All results are in units of mg/kg.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

^A ASC NEPM 1999 (amended April 2013) Health Investigation Levels (HIL)
'D' (Commercial/Industrial).

^A ASC NEPM 1999 (amended April 2013) Ecological Investigation Levels (EIL)
C&I (Commercial and Industrial).

^B Start of sample, refer to logs for sample interval

The Carcinogenic PAH value is calculated by multiplying the concentration of each of the 8 carcinogenic PAH compounds by its B(a)P toxic equivalence factor and summing these products.

Where summation required (PAH) calculation includes components reported as non detected as 1/2 PQL.

HIL for Chromium are for Chromium VI

Presented ecological value for benzo(a)pyrene is a low reliability Ecological Screening Level

ESL are applicable for material at less than 2m depths below finished surface/ground level

For the purpose of the Tier 1 ESL/EIL assessment, all background concentrations are assumed to be zero

EIL for Naphthalene are for fresh (<2years) Naphthalene

EIL for Arsenic are for aged (>2years) Arsenic

EIL for Chromium are the added contaminant limit for aged (>2years) Chromium III in soils of 1% clay, the most conservative of the criteria

EIL for Copper are the added contaminant limit for aged (>2years) Copper in soils of pH 6.5

EIL for Lead are the added contaminant limit for aged (>2years) Lead

EIL for Nickel are the added contaminant limit for aged (>2years) Nickel in soils of 5% CEC the most conservative of the criteria

EIL for Zinc are the added contaminant limit for aged (>2years) Zinc in soils of 5% CEC and pH of 6.5, the most conservative of the criteria at pH 6.5

Results shown in **BOLD** are in excess of the HIL

Results shown in shading are >250% of the HIL

Results shown in underline are in excess of EIL

* The PQL for Cd has been adjusted to 0.8 for all samples to address any uncertainty due to low spike recovery in TP1B

^A Triplicate PAH, chromium and copper results presented to quality assurance assessment

Duplicate PAH results presented to quality assurance assessment

Sample Identification	PQL	Guideline ^A		TP7C	TP8A	TP8B	TP8C	TP9A	TP9C	TP10A	TP10B	TP10C
Sample Depth (m) ^B		HIL 'D'	EIL C&I	2.0	0.1	1.0	2.0	0.1	2.0	0.1	1.0	1.4
Date				13/01/2025	14/01/2025	14/01/2025	14/01/2025	13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2025
Sample Profile				FILL, (CWR), Sandy Silty GRAVEL, fine to coarse, black	FILL, Silty Sandy GRAVEL, fine to coarse, angular, brown, with trace of CWR	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, Silty Clayey Sandy GRAVEL, fine to coarse, brown	FILL, (CWR), Silty Sandy Clayey GRAVEL, fine to coarse, dark grey/black	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light brown
Sample Purpose				Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation
Sample collected by				RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH
Polycyclic Aromatic Hydrocarbons (PAH)				#				#				
Naphthalene	0.1		370	1.2	1.1	0.6	0.6	0.2	1.8	0.5	0.8	0.6
Acenaphthylene	0.1			<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1			<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1			<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1			2.3	3.9	1.9	1.6	0.4	2	2.8	2	1.3
Anthracene	0.1			<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1
Fluoranthene	0.1			0.4	1	0.4	0.5	0.6	0.7	0.6	0.7	1
Pyrene	0.1			0.4	0.9	0.4	0.5	0.6	0.6	0.5	0.6	0.9
Benz(a)anthracene	0.1			0.3	0.6	0.3	0.3	0.3	0.4	0.4	0.4	0.5
Chrysene	0.1			0.4	0.8	0.4	0.4	0.3	0.5	0.5	0.4	0.5
Benzo(b)&(j)&(k)fluoranthene	0.2			0.3	<0.5	0.3	0.3	0.6	0.6	0.3	0.5	0.8
Benzo(a) pyrene	0.05		1.4	0.2	<1	0.2	0.2	0.3	0.3	0.2	0.2	0.4
Indeno(1,2,3-c,d)pyrene	0.1			<0.1	<0.5	<0.1	<0.1	0.2	0.2	<0.1	0.1	0.2
Dibenz(a,h)anthracene	0.1			<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1			<0.1	<0.5	<0.1	0.1	0.3	0.2	<0.1	0.2	0.3
Carcinogenic PAH (B(a)P equivalent)	0.192	40		0.3195	0.6455	0.3195	0.32	0.466	0.477	0.3305	0.356	0.608
Sum of reported PAH	1.55	4000		5.85	10.8	4.85	4.8	4.05	7.55	6.15	6.2	6.8
Metals												
Arsenic	4	3000	160	21	10	12	13	8	16	21	23	5
Cadmium*	0.8	900		<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	1	1
Chromium	1	3600	310	6	33	6	12	110	110	3	41	190
Copper	1	240000	400	22	17	21	24	27	27	24	170	110
Lead	1	1500	1800	23	21	19	23	31	49	17	71	120
Mercury	0.1	730		0.4	0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.8
Nickel	1	6000	55	10	13	11	16	16	25	9	22	20
Zinc	1	400000	360	55	42	54	67	80	100	50	260	200

All results are in units of mg/kg.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

^A ASC NEPM 1999 (amended April 2013) Health Investigation Levels (HIL)
'D' (Commercial/Industrial).

^A ASC NEPM 1999 (amended April 2013) Ecological Investigation Levels (EIL)
C&I (Commercial and Industrial).

^B Start of sample, refer to logs for sample interval

The Carcinogenic PAH value is calculated by multiplying the concentration of each of the 8 carcinogenic PAH compounds by its B(a)P toxic equivalence factor and summing these products.

Where summation required (PAH) calculation includes components reported as non detected as 1/2 PQL.

HIL for Chromium are for Chromium VI

Presented ecological value for benzo(a)pyrene is a low reliability Ecological Screening Level

ESL are applicable for material at less than 2m depths below finished surface/ground level

For the purpose of the Tier 1 ESL/EIL assessment, all background concentrations are assumed to be zero

EIL for Naphthalene are for fresh (<2years) Naphthalene

EIL for Arsenic are for aged (>2years) Arsenic

EIL for Chromium are the added contaminant limit for aged (>2years) Chromium III in soils of 1% clay, the most conservative of the criteria

EIL for Copper are the added contaminant limit for aged (>2years) Copper in soils of pH 6.5

EIL for Lead are the added contaminant limit for aged (>2years) Lead

EIL for Nickel are the added contaminant limit for aged (>2years) Nickel in soils of 5% CEC the most conservative of the criteria

EIL for Zinc are the added contaminant limit for aged (>2years) Zinc in soils of 5% CEC and pH of 6.5, the most conservative of the criteria at pH 6.5

Results shown in **BOLD** are in excess of the HIL

Results shown in shading are >250% of the HIL

Results shown in underline are in excess of EIL

* The PQL for Cd has been adjusted to 0.8 for all samples to address any uncertainty due to low spike recovery in TP1B

Duplicate PAH results presented to quality assurance assessment

TIER 1 - Total Concentrations WITHOUT Leaching Test

Sample Identification	PQL	Total Concentration ^A		TP1A	TP1B	TP2A	TP2B	TP3A	TP3B	TP3C	TB4A	TB4B
Depth		General Solid	Restricted Solid	0.1	1.0	0.1	1.0	0.1	1.0	1.7	0.1	1.0
Sample Date				13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2026	14/01/2027	14/01/2028	14/01/2025	14/01/2025
Sample Profile				FILL, (CWR), Silty Sandy GRAVEL fine to coarse, angular, dark brown, with cobbles ~200mm	FILL, (CWR), comprising GRAVEL and COBBLES, dark grey/black, angular	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black/brown	FILL, (CWR), comprising coarse GRAVEL and COBBLES	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown, with some cobbles	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, dark grey/ black	FILL, Topsoil / CWR Silty Sandy GRAVEL, fine to coarse, black	FILL, Topsoil / CWR Silty Sandy GRAVEL, fine to coarse, black
Sample Purpose				Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation
Sample collected by				RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)												
Benzene	0.2	10	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	288	1152	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	1	600	2400	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene	3	1000	4000	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total Recoverable Hydrocarbons (TRH)												
TRH C ₆ -C ₉	25	650	2600	<25	<25	<25	<25	<25	<25	<25	<25	<25
TRH C ₁₀ -C ₃₆	250	10000	40000	545	745	125	990	335	215	125	265	637
Polycyclic Aromatic Hydrocarbons (PAH)												
Benzo(a) pyrene	0.05	0.8	3.2	0.3	1.4	0.2	0.82	0.2	0.4	0.1	0.53	5.6
Sum of Reported PAH	1.55	200	800	5.45	18.1	4.2	14.32	5.1	5.65	2.2	9.13	123.3
Metals												
Arsenic	4	100	400	7	5	8	<4	8	11	11	6	6
Cadmium*	0.8	20	80	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	0.9
Chromium	1	100	400	150	520	300	760	38	110	54	16	420
Lead	1	100	400	71	78	34	71	25	38	35	23	110
Mercury	0.1	4	16	0.4	0.1	<0.1	<0.1	0.3	0.2	0.3	0.1	0.2
Nickel	1	40	160	16	26	38	51	23	31	45	7	43
Tier 1 Sample Classification				Restricted Solid Waste	Hazardous Waste	Restricted Solid Waste	Hazardous Waste	General Solid Waste	Restricted Solid Waste	Restricted Solid Waste	General Solid Waste	Hazardous Waste
Potential Waste Classification Subject to Leachate Testing				General Solid Waste	General Solid Waste	General Solid Waste	General Solid Waste	GSW as per Tier 1	General Solid Waste	General Solid Waste	GSW as per Tier 1	General Solid Waste

All total results are in units of mg/kg
PQL = Practical Quantitation Limit.
^A NSW EPA Waste Classification Guidelines, 2014. Table 1, CT1 & CT2
Results for TRH have been compared to TPH guidelines.
Guidelines reported for Chromium are for Chromium VI
Results shown in **BOLD** are in excess of the General Solid Waste criteria
Results shown in **shading** are in excess of the Restricted Solid Waste criteria
Where summation required (Xylene, TRH, PAH) calculation includes components reported as non detected as 1/2 PQL.

* The PQL for Cd has been adjusted to 0.8 for all samples to address any uncertainty due to low spike recovery in TP1B.

TIER 1 - Total Concentrations WITHOUT Leaching Test

Sample Identification	PQL	Total Concentration ^A		TB4C	TB5A	TB5B	TB5C	TP6A	TP6B	TP6C	TP7A	TP7B
Depth		General Solid	Restricted Solid	1.3	0.1	1.0	2.0	0.1	1.0	2.0	0.1	1.0
Sample Date				14/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025	13/01/2025
Sample Profile				FILL, (CWR), Silty Clayey Sandy GRAVEL, fine to coarse, black / purple brown	FILL, Silty Sandy Clayey GRAVEL, fine to medium, angular, light brown, occasional cobbles ~100-200mm	FILL, Silty Sandy GRAVEL, fine to medium, angular, light brown	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, Silty Sandy GRAVEL, fine to coarse, dark brown	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light grey	FILL, (CWR), Sandy Silty GRAVEL, fine to coarse, dark grey/ black	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown	FILL, Silty Sandy GRAVEL, fine to coarse, angular, dark brown
Sample Purpose				Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation
Sample collected by				RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)												
Benzene	0.2	10	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	288	1152	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	1	600	2400	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene	3	1000	4000	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total Recoverable Hydrocarbons (TRH)												
TRH C ₆ -C ₉	25	650	2600	<25	<25	<25	<25	<25	<25	<25	<25	<25
TRH C ₁₀ -C ₃₆	250	10000	40000	125	125	185	275	125	225	573	125	680
Polycyclic Aromatic Hydrocarbons (PAH)												
Benzo(a) pyrene	0.05	0.8	3.2	0.99	0.4	2.4	0.1	0.2	0.4	2	0.5	0.2
Sum of Reported PAH	1.55	200	800	13.69	5.25	30.25	3.55	2.65	6.45	25.55	7.2	4.5
Metals												
Arsenic	4	100	400	10	7	10	75	10	10	<4	6	17
Cadmium*	0.8	20	80	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chromium	1	100	400	180	86	130	20	40	160	<1	260	25
Lead	1	100	400	75	42	60	20	39	47	<1	44	31
Mercury	0.1	4	16	0.1	0.1	0.1	0.7	0.1	0.3	0.3	0.1	0.2
Nickel	1	40	160	27	20	29	9	10	17	<1	62	14
Tier 1 Sample Classification				Restricted Solid Waste	General Solid Waste	Restricted Solid Waste	General Solid Waste	General Solid Waste	Restricted Solid Waste	Restricted Solid Waste	Restricted Solid Waste	General Solid Waste
Potential Waste Classification Subject to Leachate Testing				General Solid Waste	GSW as per Tier 1	General Solid Waste	GSW as per Tier 1	GSW as per Tier 1	General Solid Waste	Restricted Solid Waste	General Solid Waste	GSW as per Tier 1

All total results are in units of mg/kg
PQL = Practical Quantitation Limit.
^A NSW EPA Waste Classification Guidelines, 2014. Table 1, CT1 & CT2
Results for TRH have been compared to TPH guidelines.
Guidelines reported for Chromium are for Chromium VI
Results shown in **BOLD** are in excess of the General Solid Waste criteria
Results shown in **shading** are in excess of the Restricted Solid Waste criteria
Where summation required (Xylene, TRH, PAH) calculation includes components reported as non detected as 1/2 PQL.

* The PQL for Cd has been adjusted to 0.8 for all samples to address any uncertainty due to low spike recovery in TP1B.

TIER 1 - Total Concentrations WITHOUT Leaching Test

Sample Identification	PQL	Total Concentration ^A		TP7C	TP8A	TP8B	TP8C	TP9A	TP9C	TP10A	TP10B	TP10C
Depth		General Solid	Restricted Solid	2.0	0.1	1.0	2.0	0.1	2.0	0.1	1.0	1.4
Sample Date				13/01/2025	14/01/2025	14/01/2025	14/01/2025	13/01/2025	13/01/2025	14/01/2025	14/01/2025	14/01/2025
Sample Profile				FILL, (CWR), Sandy Silty GRAVEL, fine to coarse, black	FILL, Silty Sandy GRAVEL, fine to coarse, angular, brown, with trace of CWR	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, Silty Clayey Sandy GRAVEL, fine to coarse, brown	FILL, (CWR), Silty Sandy Clayey GRAVEL, fine to coarse, dark grey/black	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, (CWR), Silty Sandy GRAVEL, fine to coarse, angular, black	FILL, Silty Sandy GRAVEL, fine to coarse, angular, light brown
Sample Purpose				Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation	Characterisation
Sample collected by				RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH	RCA - SH
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)												
Benzene	0.2	10	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	288	1152	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	1	600	2400	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene	3	1000	4000	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total Recoverable Hydrocarbons (TRH)												
TRH C ₆ -C ₉	25	650	2600	<25	<25	<25	<25	<25	<25	<25	<25	<25
TRH C ₁₀ -C ₃₆	250	10000	40000	370	840	426	381	125	287	1080	710	125
Polycyclic Aromatic Hydrocarbons (PAH)												
Benzo(a) pyrene	0.05	0.8	3.2	0.2	0.2	0.2	0.2	0.3	0.3	0.1	0.2	0.4
Sum of Reported PAH	1.55	200	800	5.85	4.5	4.85	4.8	4.05	7.55	4.55	6.2	6.8
Metals												
Arsenic	4	100	400	21	10	12	13	8	16	21	23	5
Cadmium*	0.8	20	80	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	1	1
Chromium	1	100	400	6	33	6	12	110	110	3	41	190
Lead	1	100	400	23	21	19	23	31	49	17	71	120
Mercury	0.1	4	16	0.4	0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.8
Nickel	1	40	160	10	13	11	16	16	25	9	22	20
Tier 1 Sample Classification				General Solid Waste	General Solid Waste	General Solid Waste	General Solid Waste	Restricted Solid Waste	Restricted Solid Waste	General Solid Waste	General Solid Waste	Restricted Solid Waste
Potential Waste Classification Subject to Leachate Testing				GSW as per Tier 1	GSW as per Tier 1	GSW as per Tier 1	GSW as per Tier 1	General Solid Waste	General Solid Waste	GSW as per Tier 1	GSW as per Tier 1	General Solid Waste

All total results are in units of mg/kg
PQL = Practical Quantitation Limit.
^A NSW EPA Waste Classification Guidelines, 2014. Table 1, CT1 & CT2
Results for TRH have been compared to TPH guidelines.
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Results shown in **BOLD** are in excess of the General Solid Waste criteria
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Where summation required (Xylene, TRH, PAH) calculation includes components reported as non detected as 1/2 PQL.

* The PQL for Cd has been adjusted to 0.8 for all samples to address any uncertainty due to low spike recovery in TP1B.