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Site Contamination Investigation

Client: Capstone Development Group

Site Address: 127 Gladstone Street, Mudgee

27 March 2024

Our Reference : 43539-ER01_A

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Project Name:	Preliminary Site Investigation at 127 Gladstone Street, Mudgee
Client:	Capstone Development Group (Rep. Angus Isles)
Project Number:	43539
Report Reference:	43539 ER01_A
Date:	27/03/2024

Prepared by:	**Reviewed by:**
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Executive Summary

Barnson Pty Ltd was engaged by Capstone Development Group (Rep. Angus Isles) to undertake a preliminary contaminated site investigation (PSI) of the property at 127 Gladstone Street, Mudgee, NSW 2850.

The purpose of the PSI was for investigations to assess whether the Site is suitable, or could be made suitable from a contamination perspective, for proposed residential land use.

The PSI was conducted with reference to the following legislation and guidelines:

- State Environmental Planning Policy (Resilience and Hazards) 2021.
- NSW EPA (2020) Consultants Reporting on Contaminated Land Guidelines.
- Schedule B2 or the National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).

The objectives of the PSI are to:

- Identify evidence of potentially contaminating activities that may currently or have historically occurred.
- Assess Areas of Environmental Concern and contaminants of potential concern and develop a preliminary Conceptual Site Model (CSM).
- Prepare a report detailing desktop review, site inspection findings and provide recommendations for further investigation, remedial works and/ or management, as required.

The site inspection and confirmatory sampling showed that concentrations of all contaminants investigated were below screening criteria in all surface soil samples collected. However, the presence of asbestos containing material was confirmed at the site. Visible fragments of asbestos containing material represent a risk to human health and the site is not suitable for the proposed development without remedial action to remove the asbestos contamination.

It is recommended that the fragments of asbestos containing material be removed and appropriately disposed. It is further recommended that that any remaining wastes and the mound of soil stockpiled along the rear fence of the Subject site be appropriately classified and disposed to a facility licenced to accept the waste.

Clearance inspection of the asbestos removal area must be undertaken following completion of removal work. The clearance inspection is to be carried out by a licensed, independent, asbestos assessor. A clearance certificate must be obtained from the asbestos assessor.

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1. INTRODUCTION

1.1. Background and Objectives

Barnson Pty Ltd was engaged by Capstone Development Group (Rep. Angus Isles) to undertake a preliminary contaminated site investigation (PSI) in support of the proposed re-development of the property located at 127 Gladstone Street, Mudgee, NSW 2850 (hereafter referred to as the Subject Site).

The client is proposing to submit a Development Application to Mid-Western Regional Council to develop the site for residential purposes. In accordance with the State Environmental Planning Policy Resilience and Hazards (2021), a consent authority must determine if land is contaminated and, if so, whether it is suitable for the intended purpose or require remediation, before (future) development consent may be given.

This report therefore presents a general assessment of the conditions at the Subject Site in relation to planning requirements and considers the contaminants potentially relevant to the previous commercial use of the property.

1.2. Objectives

The objectives of the Investigation are:

- Identify contamination that may affect the site's suitability for development, and
- Assess the need for possible further investigations, remediation or management of any contamination identified.

1.3. Scope of Work

To meet the stated objectives, Barnson completed the following scope of work:

- Site identification including a review of site history, site condition, surrounding environment, geology and, where information was available, hydrogeology.
- Desktop review of site history and assessment of potential sources of contamination.
- Development of a Conceptual Site Model (CSM) with information gathered from the data review and site inspection.
- Site inspection to assess site conditions.
- Collection of confirmatory soil samples and analysis to determine nature of possible contamination.
- Provide conclusions as to the suitability of the site for the intended future land use.
- Preparation of a report.

1.4. Purpose of this report

The purpose of this report is to document, with cognisance of the Guidelines for Consultants Reporting on Contaminated sites (NSW EPA, 2020), works undertaken, in accordance with the scope of works as described in Section 1.3, results of the desktop review and site inspection, and recommendations for further actions required to determine fitness of the site for the intended use.

1.5. Assumptions and Limitations

The following assumptions have been made in preparing this report:

- The most sensitive future use of the site will be for residential purposes. This assumption forms the basis for the conceptual site model (Section 4).
- All information pertaining to the contamination status of the site has been obtained through public record searches, a preliminary site inspection and analysis of confirmatory samples collected at the site. All documents and information in relation to the site, which were obtained from public records, are accepted to be correct and has not been independently verified or checked.

It should be recognised that even the most comprehensive site assessments may fail to detect all contamination on a site. This is because contaminants may be present in areas that were not previously surveyed or sampled or may migrate to areas that showed no signs of contamination when sampled. Investigative works undertaken at the Subject Site by Barnson identified actual conditions only at those locations in which sampling and analysis were performed. Opinions regarding the conditions of the site have been expressed based on historical information and analytical data obtained and interpreted from previous assessments of the site. Barnson does not take responsibility for any consequences as a result of variations in site conditions.

2. SITE DESCRIPTION

2.1. Site Identification

Table 2.1 presents a summary of the available information pertaining to the identification of the Subject Site.

Table 2.1: Summary of Site Identification Information

Information	Details
Site address	127 Gladstone Street, Mudgee, NSW 2850
Lot/Section and Deposited Plan	Lot 1 DP 1296212
Land Zoning	R3: Medium Density Residential
Area (Approx. m^2)	992
County	Wellington
Parish	Mudgee
Local Government Area	Mid-Western Regional Council

Figure 2.1 shows the Subject Site located in the central area of Mudgee.

Figure 2.1: Location of the Subject Site.

2.2. Site Layout and Proposed Development

The Subject Site is identified as Lot 1 DP 1296212 occupying an area of approximately 992m^2 and located approximately 600m south-west of the Mudgee CBD. The site is bounded by Gladstone Street and residential land uses. It is located approximately 40m from the Gladstone Street and Cox Street intersection. The Subject Site is currently unoccupied, however historical evidence indicate the site was previously used for residential purposes. The Subject site is covered with maintained grass.

Figure 2.2 presents a plan of the Subject Site that is supplemented with photographs showing the different elements of the Site (Figure 2.3 to Figure 2.5). Figure 2.2 includes markers indicating the vantage point and direction of the photographs.

Figure 2.2: Existing Subject Site layout.

Figure 2.3: Photo A – Photo of the Subject Site, looking north-west.

Figure 2.4: Photo B – View across the site, looking from northern boundary.

Figure 2.5: Photo C – Photo of driveway access from Gladstone Street.

2.3. Site History

A review of historical aerial photographs dating back to 1965 was undertaken. Historical aerial photographs are presented in Appendix A. A summary of the Site features is provided as follows:

1971 – The site is evident to have a house onsite. Surrounding land uses are predominantly residential.

1971 to 1994 – no real changes are evident to the site or surrounding land uses.

2017 – the dwelling is still located onsite, however, the site has large amounts of rubbish and vehicles stored in the rear. Building waste also seems to be evident.

2023 – the site has no changes since 2012, however, a new residential subdivision is evident to the west.

An Information Access Request to Mid-Western Regional Council (MWRC) resulted in a search of the Council records for the Subjects Site, which revealed the following development approvals relating to your property: 127 Gladstone Street, Mudgee.

- BA144/77 – Alterations to Existing Shop
- DA6/9/76 – Re-open general mixed business – There is no copy of the approved consent on file.

- DA0005/2023 – Demolition of Existing Dwelling and Rear Shed

Copies of the available development approvals are attached as Appendix B. According to MWRC, there is no record of known contamination at the Subject Site.

Based on the results of the Information Access Request there is no indication that the activities at the Subject Site included the storage or dispensing of fuel as part of the commercial activities at the site.

2.4. Record of Site Contamination

Datasets maintained by the Office of Environment and Heritage (OEH) including notices under CLM Act, POEO Environment Protection License Register, and environmental incidents were reviewed.

- List of NSW contaminated sites notified to EPA – The sites appearing on the OEH "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review information before it can make a determination as to whether the site warrants regulation. A search of the listing returned no record for the subject site.
- Contaminated Land Record of Notices – A site will be on the Contaminated Land Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*. A search of the register in March 2024 returned no record for the subject site.

There is further no record of the Subject Site in any of the following databases:

- Former Gasworks Database
- EPA PFAS Investigation Program
- Defence PFAS Investigation & Management Program
- Air Services Australia National PFAS Management Program
- Defence 3 Year Regional Contamination Investigation Program.

2.5. Previous Site Investigations

No information relating to any previous assessment of contamination at the Subject Site was available for review.

3. SITE SETTING

3.1. Geology

A review of the 1:100000 Geology Map of Mudgee (refer to Figure 3.1) shows that geologically, the Subject Site is underlain by Cainozoic aged alluvial silt, clay and sand, variable huic content, sporadic pebble-to cobble-sized unconsolidated conglomeratic lenses.

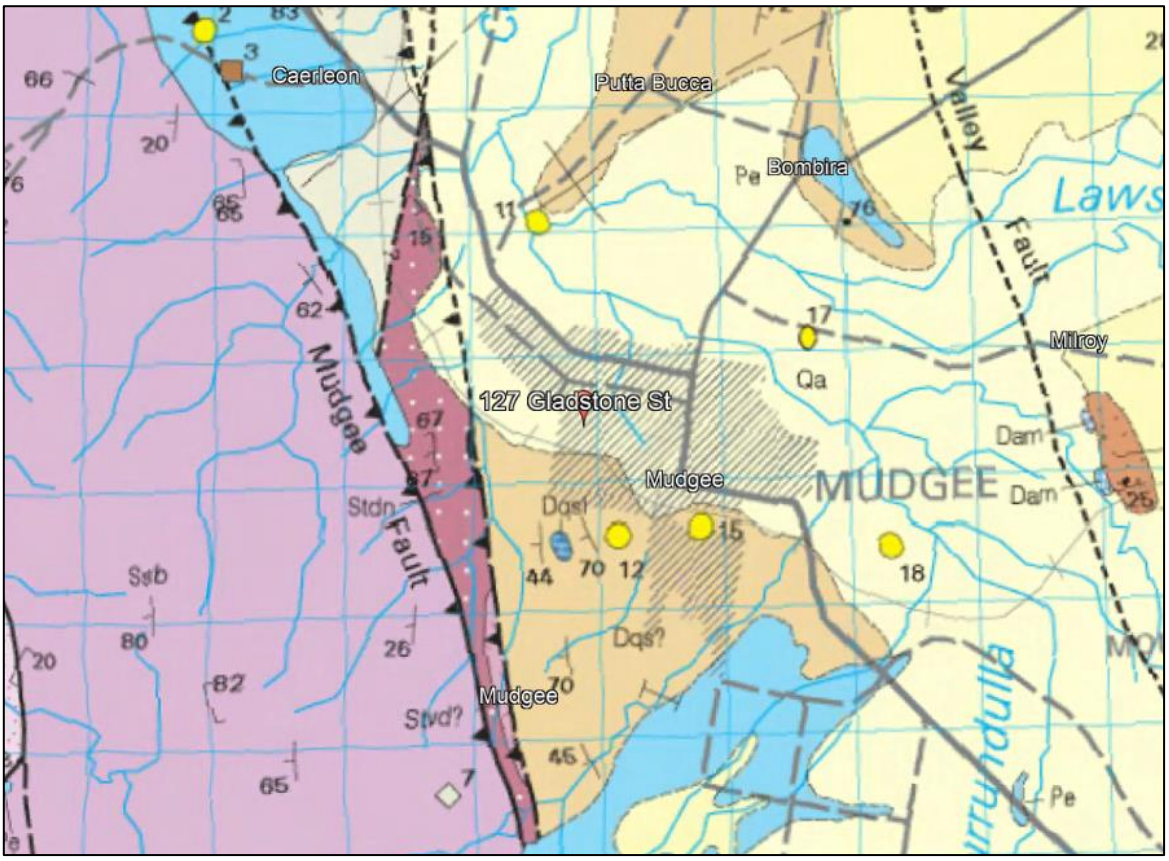

Figure 3.1: Mudgee 1:100,000 geology map showing the location of the Subject Site

Source: Google Earth, accessed 07/08/2023

An examination of the Geological Survey of NSW maps of Naturally Occurring Asbestos (accessed on 02 April 2024), shows that the geological units underlaying the Subject Site area has zero asbestos potential.

3.2. Soils

The Subject Site is mapped within the Craigmore soil landscape. Non-calcic Brown Soils (Dr2.12; Dr2.13; Dr2.42; Dr3.42) and Red Earths (Gn2.15; Gn2.16) on very old Quaternary alluvium. Yellow Podzolic-Solodic Soils intergrades (Dy3.42) on lower lying areas. Some Alluvial Soils (Uc1) and leached loams (Um4.21) on lower terraces adjacent to major streams.

The Atlas of Australian Acid Sulfate Soil has the subject site in an area of 'extremely low' probability of occurrence (a 1-5% chance of occurrence). Surface soils in the area can be saline in places.

3.3. Topography and Drainage

Figure 3.2 presents topographical information overlain on the map of the Subject Site. The presented data shows that the Subject Site is relatively flat with a very gentle slope to the north-east Gladstone Street.

Figure 3.2: Subject Site topography.

Source: en-au.topographic-map.com, accessed 07/08/2023

The closest natural water body is the Cudgegong River located 850m to the north of the Subject Site. Water drains predominantly in a northerly direction.

3.4. Groundwater Resources

A review of existing groundwater bore records (WaterNSW, 2024) indicate that no groundwater bores are located within the boundaries of the Subject Site.

Nine (9) bores are identified within 500m of the Subject Site. The five (5) closest locations of these nearby groundwater bores are shown in Figure 3.3.

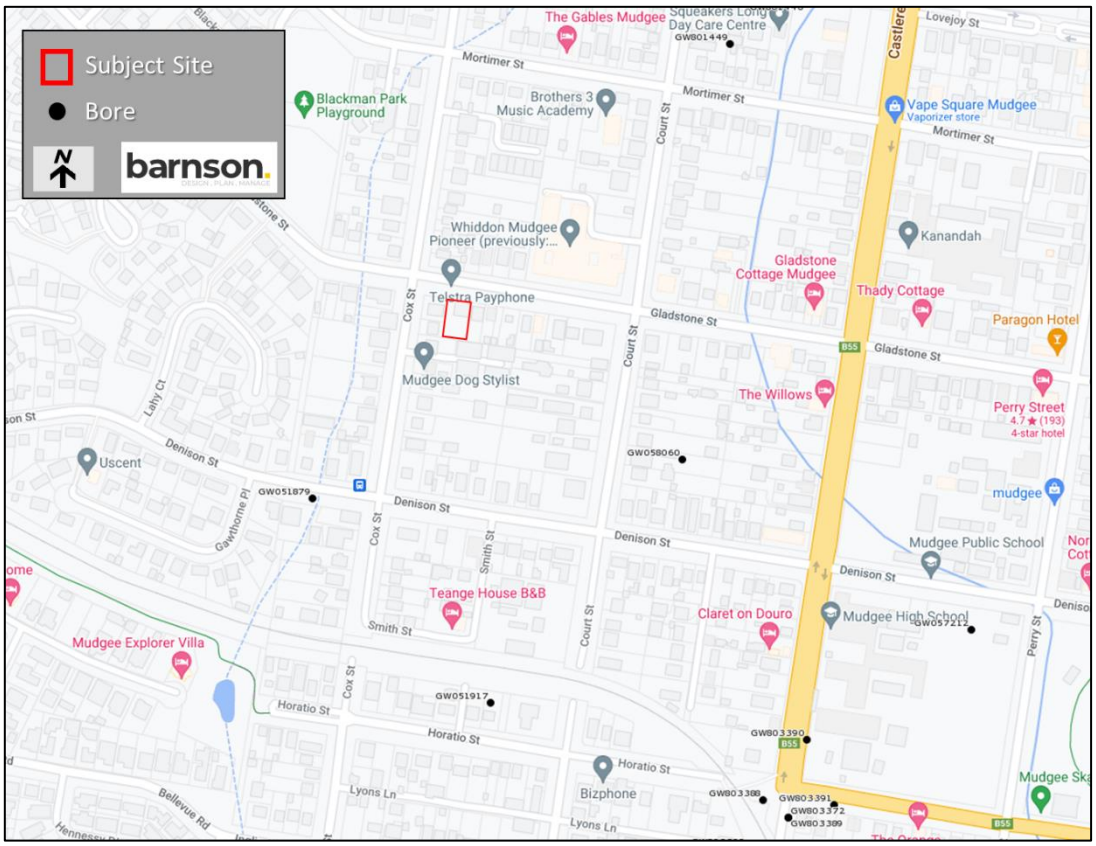

Figure 3.3: Groundwater bores near the subject site

Source: WaterNSW All Goundwater Map, accessed 11/01/2024

The information recorded in the database for the groundwater bores indicates the depth of the bores reach final depths ranging from 8.0m to 43.0m. With a Standing Water Level (S.W.L) of 1.50m recorded for GW058060 and provided a Water Bearing Zone (W.B.Z) of 4.00m. According to the database, the bores are utilised for domestic, monitoring or General purposes.

Groundwater Sensitivity mapping obtained from the ePlanning Spatial Viewer, indicate that the Subject Site is located on environmentally sensitive land. Refer to Figure 3.4.

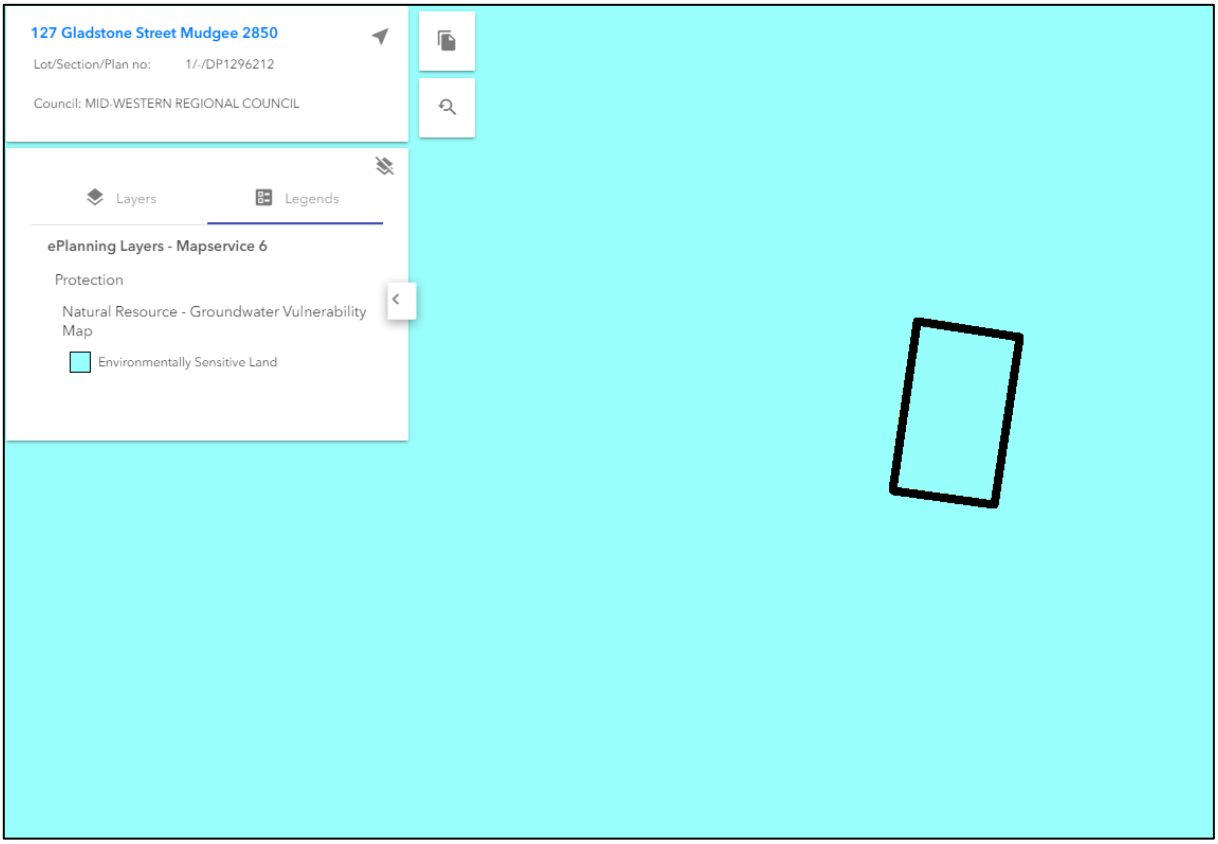

Figure 3.4: Groundwater vulnerability map

Source: ePlanning Spatial Viewer, accessed 11/01/2024

4. CONCEPTUAL SITE MODEL

4.1. General

The Conceptual Site Model (CSM) is intended to provide an understanding of the potential for contamination and exposure to contaminants within the investigation areas. The CSM draws together the available historical information for the site, with site specific geological, and hydrogeological information to identify potential contaminants, contamination sources, migration and exposure pathways and sensitive receptors.

4.2. Sources

The identification of sources presented here is based on the review of available historical information and photographs, as well as an understanding of current conditions at the Subject Site. The following is a summary of the potentially contaminated areas and sources of contamination identified:

- Building Maintenance and Demolition

Between 2017 and 2024, an existing dwelling and associated structures onsite have been demolished with the site now vacant. The potential presence of hazardous materials (e.g. asbestos and lead paint) in the structure of former buildings at the Subject Site could contribute to the introduction of these substances into the surface soils of the site as a result of demolition of these structures.

- Vehicles and motorised equipment

Aerial photos of the site show several stationary vehicles on the property during 2017. Although it is uncertain what period of time the vehicles were parked on the site, the use, storage and potential maintenance motorised equipment and vehicles has the potential to contribute hydrocarbon compounds associated with fuel, lubricating oils and hydraulic fluids to surface soils.

- Landscaping Maintenance.

The Subject Site currently has somewhat managed grasses and weeds, and historically had an existing dwelling with maintained lawns. Maintenance of lawn and plants could require the use of chemicals such as pesticides or fertilisers. Landscape maintenance activities are further expected to potentially contribute similar contaminants as introduced through the storage and use of motorised vehicles, albeit in different quantities.

- Waste disposal

The Subject Site is not fenced on all boundaries (Gladstone Street frontage open), however, there is no evidence to suggest the site has been accessed for the disposal of domestic or demolition waste. However, previous occupants of the dwelling seem to have disposed of a variety of items on site either during the occupancy or demolition of the dwelling. The surface of part of the site appears to have been scraped to the back of the lot where it is stockpiled in an elongated mound. This mound contains items such as paper, plastic and metals and has the potential to be a source of source of associated contamination (e.g heavy metals and hydrocarbons).

4.3. Contaminants of Potential Concern

Considering the potential sources relevant to the Subject Site, a wide variety of contaminants may be present. With the demolition waste and vehicles/equipment formerly stored at the site considered the primary potential sources of contamination, hazardous materials (i.e. asbestos and lead based paint) as well as heavy metals and hydrocarbons are accepted as the most likely contaminants.

Based on this understanding of the site history and activities, the contaminants of potential concern identified for the investigation of the Subject Site include:

- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn)
- hydrocarbons (mainly fuel and lubricants); and
- asbestos

4.4. Pathways

The primary pathways by which receptors could be exposed to the contaminants outlined above include:

- Inhalation of dust or vapours.
- Dermal contact with contaminated soils.
- Incidental ingestion of contaminated soils.
- Surface runoff, sediment transport and discharge to surface waters.
- Vertical and horizontal migration of contamination through the soils into the underlying groundwater.

Of the listed potential pathways, the contamination of water resources through infiltration is considered the most unlikely. Although the Subject Site is indicated as a groundwater vulnerable zone, the lack of groundwater bores and the presumed depth to groundwater at the site (approximately 20m) would limit vertical migration of any contaminants which may be entering the surface soil from above.

4.5. Receptors

Potential receptors may include:

Human receptor populations

- Future residents of the subdivided lots.
- Visitors to the site (e.g. workers conducting maintenance, contractors, members of the public);
- Workers involved in the construction of residential dwellings for future residents of the Subject Site; and
- Workers conducting agricultural activities on the subdivided lots of the Subject Site.

Environmental Receptors

- Local drainage channels and receiving surface water bodies; and
- Groundwater resources beneath the site (negligible likelihood of contamination expected).

4.6. Potential for Contamination

The Subject Site is not listed in any of the contaminated land databases. Based on the results of the desktop assessment, the overall likelihood for *Significant* chemical contamination to be present within the site is low.

Although building demolition has occurred at the Subject Site it is reasoned that the type and quantity of contaminants introduced through this would likely not have led to significant contamination of the surface soils.

5. SITE INVESTIGATION

5.1. General

The objective of the investigation is to determine whether there are any environmental risks associated with the Subject Site that could affect the proposed future development and would require further investigation or action to render the site suitable for its intended use.

The desktop evaluation of the site history did identify historical land use activities that could contribute to contamination of the surface soils of the Subject Site.

Barnson conducted an inspection of the Subject Site on 08/03/2024. The purpose of the site inspection was to verify the findings of the desktop assessment, as well as to collect confirmatory samples of soil from areas of the Subject Site where development is proposed, or contamination is suspected.

Based on the findings of the CSM the inspection and sampling were focussed on the surface soils (0-150mm). The site inspection included all areas of the Subject Site. During the site inspection the following observations were made:

- The Subject Site is not fenced and access to the site is not controlled.
- At present, the subject site is covered in un-maintained grasses and weeds (Figure 5.1).
- Building waste evident in several different locations over the Site (Figure 5.2).
- Fragments of fibre reinforced cement sheeting was observed in several locations (Figure 5.3)

Figure 5.1: Photo of the somewhat managed weeds.

Figure 5.2: Demolition waste.

Figure 5.3: Fibre reinforced cement sheet fragments.

- No surface water was present on the Subject Site or in the local drainage channel to the east during the site inspection.

- A mound of soil located along the southern fence line of the Subject Site appears to have been formed from pushed to this location form the rear part of the Subject Site. The mound contains rocks, plastick, metal (cutlery) and paper and appears to have been an attempt to tidy-up the lot. The mound was quite overgrown but was excavated by hand at a series of 8 locations along its length. The excavations revelad mainly soil and wastes. No demolition waste were observed. It is reasoned that the soils were stockpiled in this manner before the demolition of the dwelling.

Figure 5.4: Long overgrown mound of soil and waste along the rear of the property.

- A geotechnical investigation of the Subject Site indicated no descernable layer of fill material located over the site. The borelogs for the Geotechnical investigation indicate a layer of top-soil underlain by sandy silty clay. Figure 5.5 present a succession of soil samples retrieved from a geotechnical bore to 3m. Heaps of soil represent 500mm intervals from surface (0mm).

Figure 5.5: Soil samples retrieved at 500mm intervals to 3.0m from a geotechnical bore at the Subject Site.

- No stained or discoloured soil, or clearly inhibited or affected vegetation were observed anywhere on the Subject Site. No discoloration of any soil that could be construed as contamination was observed. Surface materials over the north eastern corner of the site appeared slightly darker in colour compared to the rest of the subject site. Presumably this is due to the presence of darker coloured topsoil in this area.

5.2. Confirmatory Sampling

The purpose of collecting confirmatory samples as part of the site inspection is to determine if any of the potential contaminants identified from the CSM are present. The samples are not intended for statistically valid characterisation or quantification of contamination levels.

Based on the findings of the CSM the inspection and sampling were focussed on the surface soils (0-150mm) and stockpiles wastes present at the Subject Site.

The site inspection included all accessible areas of the Subject Site. Figure 5.6 presents a map of the Subject Site with the locations of the soil samples indicated. Table 5.1 is a summary description of the collected samples.

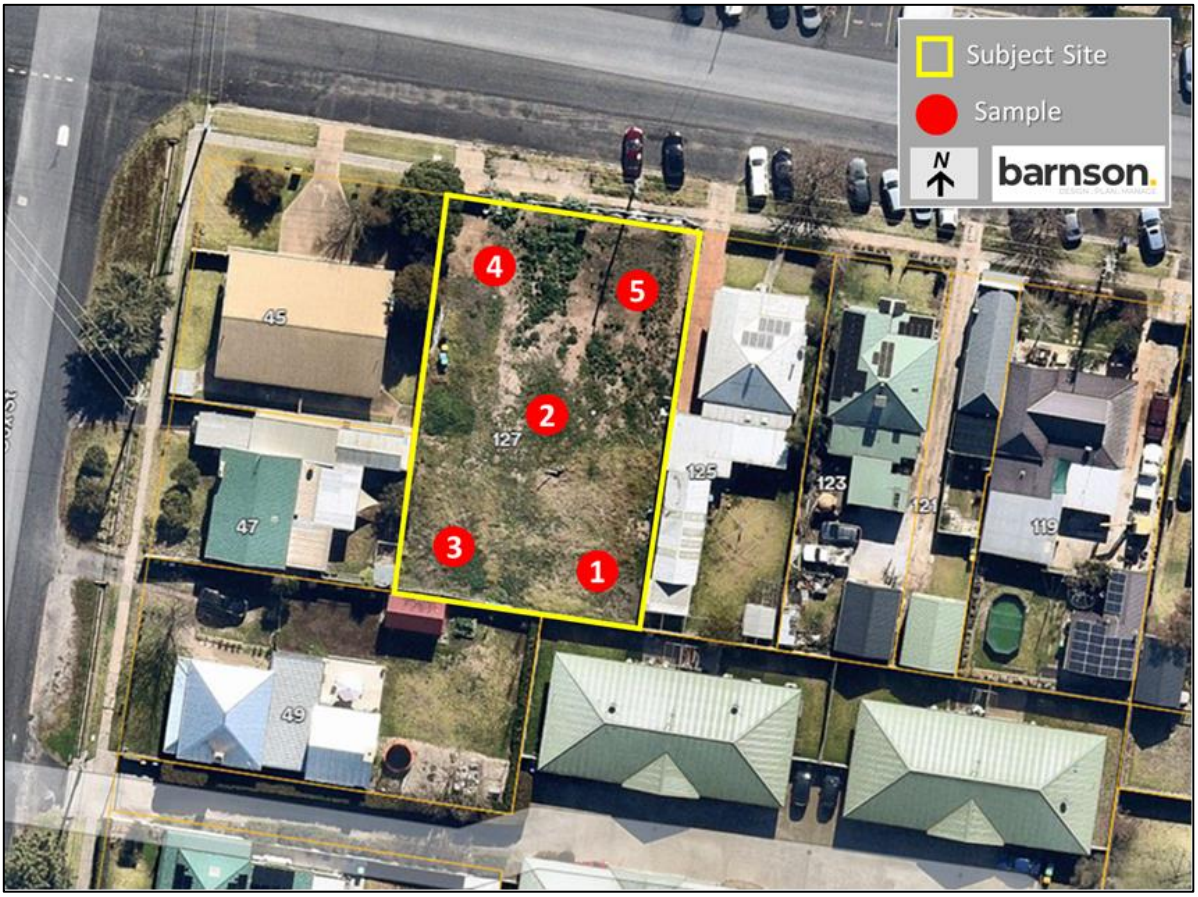

Figure 5.6: Surface soil sample locations.

The pattern followed for the soil sampling can be described as Systematic Sampling, where points are selected at regular intervals across the surface of the site. It is an efficient sampling method for confirmatory sampling that utilises knowledge of the site history and field observations to direct sample collection (NSW EPA, 2020).

Table 5.1: Summary of sample details.

Reference in Figure 5.6	Sample Designation	Description
1	TP-01	Soil collected from mound of material in back of the site
2	TP-02	Surface soil (0-150mm) collected from centre of site where demolition waste is evident
3	TP-03	Soil collected from mound of material in back of the site

4	TP-04	Surface soil (0-150mm) collected from area of site where former driveway was located
5	TP-05	Surface soil (0-150mm) collected from front area of site where soil appears darker

Two additional surface soil samples were collected (TP-03a & TP-04a). The two additional samples are intended for screening of asbestos. Additionally, six (6) cement sheet fragments were collected from different locations where fragments were observed, and submitted for asbestos analysis.

The samples submitted for analysis were submitted to the Australian Laboratory Services (ALS) laboratory in Mudgee, for determination of the following parameters:

- metallic element (cadmium, chromium, copper, lead, nickel and zinc) concentrations, including arsenic and mercury in soil;
- extraction with organic solvent and analysis of Total Recoverable Hydrocarbons (TRH) fractions C6 to C40, benzene, toluene, ethylbenzene and total xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and phenols;
- extraction with organic solvent and analysis of Organochlorine (OCP) and Organophosphorus (OPP) pesticide compounds; and
- asbestos screening.

The ALS laboratory is NATA accredited for all the analysis indicated above. Table 5.2 present a summary of the samples submitted for analysis as well as the sample numbers assigned to each analytical sample and the analysis requested for each.

Table 5.2: Summary of analysis undertaken on soil and water

Sample Number	Location Reference in Figure 5.6	Analysis
TP-01	1	TRH (C6-C40), BTEXN, PAH, OC, PCB, 8 Metals
TP-02	2	TRH (C6-C40), BTEXN, PAH, OC, PCB, 8 Metals
TP-03	3	TRH (C6-C40), BTEXN, PAH, 8 Metals
TP-04	4	TRH (C6-C40), BTEXN, PAH, 8 Metals
TP-05	5	TRH (C6-C40), BTEXN, PAH, 8 Metals
TP-03a	3	Asbestos - Soil
TP-04a	4	Asbestos - Soil
S-1	-	Asbestos - Solid
S-2	-	Asbestos - Solid

S-3	-	Asbestos - Solid
S-4	-	Asbestos - Solid
S-5	-	Asbestos - Solid
S-6	-	Asbestos - Solid

5.3. Analytical Results

The ALS report for the samples is attached as Appendix C. The laboratory report indicates that heavy metals as well as trace quantities of Polynuclear Aromatic Hydrocarbons (PAHs) and petroleum hydrocarbons, were detected in the soil. The concentrations of all pesticides, and total polychlorinated biphenyls are indicated as below the limits of detection in all samples.

The metals detected include arsenic (As), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), and zinc (Zn). Concentrations of cadmium (Cd) were shown to be below the limit of reporting in all samples.

Table 5.3 presents a summary of the compounds and elements detected above the limit of detection in surface soil samples.

Table 5.3: Summary of metals and hydrocarbons detected in soil samples collected from the Subject Site.

Sample Number	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	mg.kg^{-1}							
TP-01	9	<1	18	48	196	0.6	10	603
TP-02	7	<1	14	34	119	0.3	9	722
TP-03	7	<1	20	35	215	0.5	10	366
TP-04	11	<1	24	33	201	0.4	10	326
TP-05	10	<1	20	28	91	0.2	10	171

No asbestos fibres were detected in either of the two surface soil samples submitted for analysis, however, five of the six solid samples (except S-1) returned positive results for asbestos fibres.

Table 5.3 presents a summary of the PAH and hydrocarbon compounds detected above the limit of detection in the soil samples.

Table 5.4: Summary of PAHs and hydrocarbons detected in soil samples collected from the Subject Site.

Parameter	TP-01	TP-02	TP-03	TP-04	TP-05
	mg.kg^{-1}				
Benzo(a)pyrene TEQ (LOR)	2.0	1.2	1.3	1.2	1.2
Sum of PAHs	9.1	1.2	3.0	1.1	<0.5
>C16 - C34 (F3)	160	130	<100	<100	<100
>C10 - C40 Fraction (sum)	160	130	<50	<50	<50

5.4. Analytical Data Quality

Samples were collected in new, clean containers using cleaned equipment and soils were placed in glass jars provided by the laboratory that were refrigerated after filling and transported in an insulated container to the laboratory. Chain of custody was recorded for all samples. A copy of the signed sheet is attached as Appendix C.

The analyses were undertaken at a NATA accredited laboratory. The laboratory quality control procedures in the form of duplicates as well as analyte and surrogate spikes were applied to all contaminant classes analysed. The results reported for the duplicate is within the Relative Percent Difference range of the acceptance criteria for a duplicate sample. The analyte spike recoveries reported for the different sets of organic analytes are indicated as within the acceptance criteria (see Appendix C).

All media appropriate to the objectives of this investigation have been adequately analysed and no area of significant uncertainty exist. It is concluded the data is suitable for the purposes of the contaminated site investigation.

6. ASSESSMENT

6.1. Assessment Criteria – Human Health and Environmental Risk

Screening for human health and ecological risk, utilises published human health investigation levels (HILs) and ecological screening and investigation levels (ESLs & EILs) from the National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) to identify contaminant concentrations in soil that may pose a risk to future residents, people visiting the site, or to ecological receptors.

HILs are scientifically based, generic assessment criteria designed to be used in the screening of potential risks to human health from chronic exposure to contaminants. HIL's are conservatively derived and are designed to be protective of human health under the majority of circumstances, soil types and human susceptibilities and thus represent a reasonable 'worst-case' scenario for specific land-use settings.

The HILs selected for evaluation of the Investigation Areas are those derived for a standard residential scenario (HIL-A), which assumes typical residential land use with garden/accessible soil (home grown produce <10% fruit and vegetable intake, and no poultry). The standard residential scenario is conservative to use for evaluation. Although all of the exposure pathways included in the residential scenario are unlikely to exist in the proposed development, the more conservative HILs are used to account for sensitive receptors such as children, the elderly or persons with illnesses which may be residing in the proposed development.

The HIL-A values for PAHs are based on the 8 carcinogenic PAHs and their Toxicity Equivalency Factors (TEF) relative to Benzo(a)pyrene (B(a)P). . The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF and summing these products. The HIL-A screening also considers the total concentration of all PAHs.

Although the primary concern in most site assessments is protection of human health, the assessment should also include consideration of ecological risks and protection of groundwater resources that may result from site contamination. EILs provide screening criteria to assess the effect of contaminants on a soil ecosystem and afford species level protection for organisms that frequent or inhabit soil and protect essential soil processes.

Ecological investigation levels (EILs) have been derived for common metallic contaminants in soil. The values selected for the evaluation of the heavy metals detected in the soil samples from the Subject Site considers the physicochemical properties of soil and contaminants and the capacity of the soil to accommodate increases in contaminant levels above natural background while maintaining ecosystem protection for identified land uses.

Table 6.1 presents a summary of the health-risk based criteria and ecological investigation levels selected for assessment of the detected metal and PAH concentrations. There are no ecological investigation levels for PAH compounds.

It was confirmed that limits of detection reported by the laboratory are below the criteria values. All other contaminants analysed for in the soil samples that are reported below the limit of detection by the laboratory can therefore be excluded from further assessment.

Table 6.1: Human health and ecological risk screening levels.

Element	Health-based Investigation Levels HIL A Residential mg.kg^{-1}	Ecological Investigation Levels (EIL) Urban residential and public open space mg.kg^{-1}
Arsenic (As)	100	100
Cadmium (Cd)	20	NA
Chromium	NR	190
Copper (Cu)	6,000	190
Lead (Pb)	300	1,100
Mercury (Hg)	40	NA
Nickel (Ni)	400	30
Zinc (Zn)	7,400	230
benzo(a)pyreneTEQ	3	NA
Total PAHs	300	NA

Note: NR=not relevant due to low human toxicity of Cr(III). NA=No applicable screening level. EILs selected are most conservative values relevant to residential land use scenario.

The health risks associated with petroleum hydrocarbon compounds are assessed using Health Screening Levels (HSLs) developed to be protective of human health by determining the reasonable maximum exposure from sources for a range of situations commonly encountered on contaminated sites. HSLs are derived for soil, groundwater and soil vapour and relate to exposure to petroleum hydrocarbons through the vapour inhalation exposure pathway only. Direct exposure pathways such as incidental soil ingestion and dermal exposure pathways are generally not the risk drivers when compared to inhalation exposure (NEPC, 1999). HSLs have been developed for BTEX and naphthalene plus four hydrocarbon fractions namely:

- C6-C10- Fraction number F1
- >C10-C16- Fraction number F2
- >C16-C34- Fraction number F3
- >C34-C40- Fraction number F4

Ecological risks associated with hydrocarbons are evaluated by using ecological screening levels (ESLs), which are based on EC_{25} weight-of-evidence ecotoxicity data, evaluated for a commercial/industrial land use scenario (NEPC, 1999). The ESLs (Table 6.2) are evaluated for the same four carbon chain fraction ranges (F1 to F4) listed above. Screening values for a commercial/industrial exposure scenario are listed.

Table 6.2: Human health and ecological risk screening levels for hydrocarbon fractions.

	Management limits for TPH in Soil	Health Screening Levels (HSLs) for vapour intrusion	Ecological Screening Levels (ESL)
	Urban residential and public open space (fine)	Low density residential 0-1m)	Urban residential and public open space (fine)
Fraction	mg.kg^{-1}	mg.kg^{-1} (soil)	mg.kg^{-1}
F1	800	210	180
F2	1,000	160	120
F3	3,500	NA	1,300
F4	10,000	NA	5,600

NA=No applicable screening level.

The National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) notes health risk based screening levels for asbestos contaminated soil (for the Residential A scenario) as 0.01% (w/w) for Bonded ACM, 0.0001 for friable asbestos and no visible asbestos in surface soil (all forms of asbestos).

6.2. Findings

- Direct comparison of the analytical results presented in Table 5.3 with the assessment criteria (refer Table 6.1 and Table 6.2) show that the detected metal and hydrocarbon concentrations in samples collected from the Subject Site are well below residential health and ecological risk based criteria values. The general low concentrations of heavy metals detected suggest naturally occurring element abundance. The mostly trace quantities of PAH and hydrocarbons detected are typical for a residential site with a history of commercial activity and sources such as stationary vehicles and vehicle repair.
- The elevated concentrations of lead and zinc compounds relate to the mound of soil observed along the rear fence of the subject site, as do the detected concentrations of PAHs and hydrocarbons. It appears that surface soils that potentially may have included heavy metal and hydrocarbon contaminants as a result of the activities in the back yard of the form er dwelling were scraped into the mound along the rear fence. The concentrations of metals and hydrocarbons detected in the samples from this mound of soil are relatively low and are well below the Health Screening criteria.
- The presence of asbestos containing material (ACM) as fragments on surface was confirmed. The proposed development will require excavation of the site which will disturb the surface fragments. Although broken, the bonded ACM fragments appear in reasonable condition and are not easily crumbled i.e. not fibrous asbestos. There is no evidence from the site history or direct observation during the site walkover that other fibrous asbestos materials (such as insulation or woven materials) are present on the site. Soil samples analysed for asbestos confirmed no fragments or fibres are present in the soil.

- The concentrations of all pesticides, polycyclic organic compounds as well as total polychlorinated biphenyls are indicated as below the limits of detection in all surface soil.
- The confirmatory samples collected and analysed as part of this investigation thus support the assertion that significant and widespread chemical contamination is unlikely to be present within the Subject Site

6.3. Discussion

The number of samples and sampling methodology followed is not sufficient to quantify the weight percentage of ACM for comparison to the HSL-A value. However, visible fragments are observed at the surface of the site. Further action to remediate the ACM contamination is therefore required.

The recommended general process for assessment of site contamination, including for assessment of asbestos, is shown in Schedule of the National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999). The process starts with a Preliminary Site Investigation (PSI), which may lead to a Detailed Site Investigation (DSI).

Depending on the site-specific circumstances and the proposed remediation approach, conservative management of the asbestos contamination may avoid the need for a DSI. Where remediation is required, appropriate validation sampling should be carried out to verify the effectiveness of the measures undertaken.

A DSI is not necessary where there is a high degree of confidence that the asbestos contamination is confined to bonded ACM in superficial soil, i.e. the site history can be established with confidence and this clearly indicates that there is no reason to suspect buried asbestos materials and the site

inspection confirms that any bonded ACM is in sound condition and only present on the surface/near surface of the site. In these circumstances the assessment can proceed directly to remediation (removal of bonded ACM fragments and ensuring that the soil surface is free of visible asbestos) and validation.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusions

In accordance with the objectives stated in Section 1.2, and based on the information contained within this assessment, the following conclusions are presented (subject to the limitations noted in Section 1.5):

- Activities associated with the historical use of the Subject Site were identified as having a potential to contaminate surface soil at the site.
- The following potential sources of contamination were identified:
  - Building Maintenance and Demolition
  - Vehicles and motorised equipment
  - Landscaping Maintenance.
  - Waste disposal
- A review of the available historical information, including contaminated sites databases and aerial photographs, indicated a low potential for significant environmental contamination to be present across the surface of the Site. There was a concern that the commercial activities previously undertaken at the property may have included fuel storage and fuel dispensing. Information from Council records, however, indicated that this was likely never part of the activities at the Subject Site.
- Inspection of the site and anecdotal information from an owner of a neighbouring business, confirmed that fuel dispensing had not taken place at the site.
- The inspection and investigation of the site therefore focussed on the potential contribution that on site storage of vehicles and the demolition of the former residential structure may have made to contaminants in the surface soils of the site.
- Confirmatory sampling confirmed that small quantities of the contaminants investigated were present but that the concentrations of all are below screening criteria in all surface soil samples collected. No persistent pesticides or herbicides were detected in any of the samples collected.
- The presence of asbestos containing material was confirmed at the site. Visible fragments of asbestos containing material represent a risk to human health and the site is not suitable for the proposed development without remedial action to remove the asbestos contamination. No hazardous materials were detected in any of the surface soil samples collected at the Subject Site.
- The screening criteria used in the evaluation of the contaminant concentrations were appropriately conservative and suitable for assessment of the proposed residential land use categories.
- Based on the findings of the site investigation it is concluded that the concentrations of heavy metals, PAHs and petroleum hydrocarbons detected in the surface soils of the Subject Site does not represent any potential risk to human health or the environment.

7.2. Recommendations

- Based on the findings of the desktop review and site investigation it can be stated with a reasonable level of confidence that the Subject Site may be rendered suitable for the proposed Development, with the removal of all asbestos containing material visible on surface.
- The Subject Site is not currently subject to a Statutory Site Audit, and in terms of the Guidelines for the NSW Site Auditor Scheme (NSW EPA, 2017), the EPA may recommend that any remedial work proposed as a result of this assessment be independently verified.
- Two potential options for rendering the site suitable for development exist:
    - Option A - excavate all the affected material (and validate the work undertaken including that no visible asbestos is present on the site surface) and either manage by containment on-site or off-site disposal at an appropriate waste facility
    - Option B - carry out a Detailed Site Investigation to delineate the volume of contaminated soil requiring on-site containment or off-site disposal
- Based on the recommendations of the National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) Option A can be implemented as evidence presented indicate that only bonded ACM is present.
- The asbestos containing material (ACM) at the Subject Site, requires specialist attention during any removal or remedial action. It is recommended that during any removal of waste from this area, the ACM be removed and transported to a landfill, licensed to accept the waste, for disposal. The removal and disposal task can be undertaken by either a competent person or a licensed asbestos removalist.
- Clearance inspection of the asbestos removal area must be undertaken following completion of removal work. The clearance inspection is to be carried out by a licensed, independent, asbestos assessor. A clearance certificate must be obtained from the asbestos assessor.
- Notification to SafeWork of the asbestos removal works will be required if the ACM to be removed is more than 10m2.
- Tracking of the collected ACM will be required. Transport of asbestos waste is regulated under EPA legislation. Disposal sites are regulated by the NSW EPA and local government.
- It is further recommended that any remaining wastes and the mound of soil stockpiled along the rear fence of the Subject site be appropriately classified and disposed to a facility licenced to accept the waste.
- A Construction Environmental Management Plan (CEMP) must be prepared, prior to construction works being started. The purpose of the CEMP is for the management of excavated soils and should include procedures for the management of sediment and erosion.
- It is recommended that any material excavated at the Subject Site as part of the redevelopment, be classified in accordance with the general solid waste (NSW EPA, 2014) and excavated natural material (NSW EPA, 2014a) guidelines (ENM Order), and appropriately disposed.

8. REFERENCES

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

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NSW EPA. (2014a). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014.* Sydney: NSW Environment Protection Authoroty.

NSW EPA. (2020). *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.* NSW Environmental Protection Agency.

NSW EPA. (2020). *Sampling Design Part 1 - Application, Contaminated Land Guidelines.* Sydney: NSW EPA.

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barnson.

APPENDIX A

Historical Site Photographs


1971


1980


1994


2017


2024
Cox St
45
47
49
127
125
123
121
119

barnson.

APPENDIX B

Development approvals relating to 127 Gladstone Street, Mudgee.

MID-WESTERN REGIONAL COUNCIL
PO Box 156, MUDGEE NSW 2850
86 Market Street, Mudgee | 109 Herbert Street, Gulgong | 77 Louee Street, Rylstone
T 1300 765 002 or 02 6378 2850 | F 02 6378 2815
E council@midwestern.nsw.gov.au

Sarah Hopkins:ma:DA0005/2023

15 November 2022

Anthony Carl Rohr Fuller
4/101 Milson Road
CREMORNE POINT NSW 2090

Dear Sir/Madam

DEVELOPMENT APPLICATION DA0005/2023 - DEMOLITION OF EXISTING DWELLING AND SHED AT LOT B DP 157038 NO. 127 GLADSTONE STREET MUDGEE NSW 2850

I am pleased to advise that your application has been approved by Council.

Attached is Council's formal Development Consent No. DA0005/2023.

It is important that you read the consent and understand the requirements of any conditions imposed. Certain requirements may need to be satisfied prior to proceeding with the development.

The consent is a legal document and should be kept for your future reference as the development proceeds. It should be noted that commencement of the development implies your acceptance of the conditions of consent.

Should you have any query regarding the consent or associated conditions, do not hesitate to contact myself or the appropriate Council officer.

MID-WESTERN REGIONAL COUNCIL
PO Box 156, MUDGEE NSW 2850
86 Market Street, Mudgee | 109 Herbert Street, Gulgong | 77 Louee Street, Rylstone
T 1300 765 002 or 02 6378 2850 | F 02 6378 2815
E council@midwestern.nsw.gov.au

Notice of Determination of a Development Application

Issued under the *Environmental Planning and Assessment Act 1979* Section 4.16(1)(a)

Our Ref:	Sarah Hopkins:ma:DA0005/2023	**DA No:**	DA0005/2023

Applicant:	Anthony Carl Rohr Fuller 4/101 Milson Road CREMORNE POINT NSW 2090	**Land to be Developed:**	Lot B DP 157038 127 Gladstone Street MUDGEE NSW 2850

Proposed Development: Demolition of existing dwelling and shed	**Building Code of Australia Classification:** -

Date of Determination:	14 November 2022
Determination:	**CONSENT GRANTED** subject to conditions set out below

Consent to operate from: 15 November 2022	**Consent to lapse on:** 15 November 2027

CONDITIONS

APPROVED PLANS

1. The development is to be carried out in accordance with the following plans endorsed with Council's Stamp as well as the documentation listed below, except as varied by the conditions listed herein and/or any plan notations.

Title/Name:	Drawing No/ Document Ref	Revision/Issue:	Date:	Prepared by:
Site Plan – Dwelling Demolition	-	-	-	Not specified

GENERAL

2. This development consent provides approval for the demolition of an existing dwelling and shed, only.

3. No trees on public property (footpaths, roads, reserves etc.) shall be removed or damaged during demolition works including the erection of any fences or hoardings.

4. All public footways, foot paving, kerbs, gutters and road pavement damaged during the works are to be restored to match existing conditions at the Developer's/Demolisher's expense.

PRIOR TO THE COMMENCEMENT OF WORKS

5. Water and sewer services are to be disconnected and capped prior to the commencement of works.

6. If any of the structures are connected to electrical power these services are to be disconnected by a licenced trade person prior to any demolition taking place.

7. A sign must be erected in a prominent position on any work site on which involved in the demolition of a building is carried out:
   a) stating that unauthorised entry to the work site is prohibited;
   b) showing the name of the person in charge of the work site and a telephone number at which that person may be contacted outside working hours;
   c) the name, address and telephone number of the principal certifying authority for the work; and
   d) the sign must be maintained while the demolition work is being carried out and removed when the work has been completed.

8. If the work involved in the demolition of the building;
   a) is likely to cause pedestrian or vehicular traffic in a public place to be obstructed or rendered inconvenient, or
   b) building involves the enclosure of a public place.

   A hoarding or fence must be erected between the work site and the public place. If necessary, an awning is to be erected, sufficient to prevent any substance from, or in connection with, the work falling into the public place. Any such hoarding, fence or awning is to be removed when the work has been completed.

9. The development site is to be managed for the entirety of work in the following manner:
   a) Erosion and sediment controls are to be implemented to prevent sediment from leaving the site. The controls are to be maintained until the development is complete and the site stabilised with permanent vegetation;
   b) Appropriate dust control measures;
   c) Demolition equipment and materials shall be contained wholly within the site unless approval to use the road reserve has been obtained;
   d) Toilet facilities are to be provided on the work site at the rate of one toilet for every 20 persons or part of 20 persons employed at the site.

10. Prior to the commencement of works on site, the applicant shall advise Council's Development Engineers at the Operations Department in writing, of any existing damage to Council property.

DURING DEMOLITION

11. All demolition works are to be carried out in accordance with AS 2601-2001 "Demolition of structures", with all waste being removed from the site. Hazardous waste such as asbestos cement sheeting etc, shall be handled, conveyed and disposed of in accordance with guidelines and requirements from SafeWork NSW. Disposal of asbestos material at Council's Waste Depot requires prior arrangement for immediate landfilling.

12. The removal of any asbestos material (less than 10m²) during the demolition phase of the development is to be in accordance with the requirements of the SafeWork NSW and disposed of at an approved waste facility.

13. Demolition work noise that is audible at other premises is to be restricted to the following times:

    a) Monday to Saturday - 7.00am to 5.00pm

    No demolition work noise is permitted on Sundays or Public Holidays.

14. There being no interference with the amenity of the neighbourhood by reason of the emission of any "offensive noise", vibration, smell, fumes, smoke, vapour, steam, soot, ash or dust, or otherwise as a result of the proposed development.

15. Should any contaminated, scheduled, hazardous or asbestos material be discovered before or during construction works, the applicant and contractor shall ensure the appropriate regulatory authority (eg Office of Environment and Heritage (OEH), WorkCover Authority, Council, Fire and Rescue NSW etc) is notified, and that such material is contained, encapsulated, sealed, handled or otherwise disposed of to the requirements of such Authority.

    Note: Such materials cannot be disposed of to landfill unless the facility is specifically licensed by the EPA to receive that type of waste.

16. In the event of any Aboriginal archaeological material being discovered during earthmoving/demolition works, all work in that area shall cease immediately and the Office of Environment and Heritage (OEH) notified of the discovery as soon as practicable. Work shall only recommence upon the authorisation of the OEH.

17. In the event a relic is discovered during earthmoving/demolition works, all work in that area shall cease immediately and the Heritage Council notified as soon as practicable.

    Note: a relic is defined in the Heritage Act 1977 as any deposit, artefact, object or material evidence that –
    a) Relates to the settlement of an area, not being Aboriginal settlement, and
    b) Is of State or local heritage significance.

ADVISORY NOTES

1. The removal of trees within any road reserve requires the separate approval of Council in accordance with the policy "Tree Removal and Pruning - Public Places".

2. The land upon which the subject building is to be constructed may be affected by restrictive covenants. This approval is issued without enquiry by Council as to whether any restrictive covenant affecting the land would be breached by the construction of the building, the subject of this approval. Persons to whom this approval is issued must rely on their own enquiries as to whether or not the building breaches any such covenant.

3. Division 8.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) gives you the ability to seek a review of the determination. This request is made to Council and must be made within 6 months after the date on which you receive this notice. The request must be made in writing and lodged with the required fee; please contact Council's Development Department for more information or advice.

4. If you are dissatisfied with this decision section 8.7 of the EP&A Act gives you the right to appeal to the Land and Environment Court within 6 months after the date on which you receive this notice, pursuant to section 8.10(1)(b).

5. To ascertain the extent to which the consent is liable to lapse, refer to Section 4.53 of the EP&A Act.

STATEMENT OF REASONS

The determination decision was reached for the following reasons:

1. The proposed development complies with the requirements of the applicable environmental planning instruments and Mid-Western Regional Development Control Plan 2013.

2. The proposed development is considered to be satisfactory in terms of the matters identified in Section 4.15 of the Environmental Planning & Assessment Act 1979.
3. No submissions were received during the neighbour notification period.

OTHER APPROVALS

N/A

Signed on behalf of Mid-Western Regional Council by:

MUDGEE SHIRE COUNCIL

DEVELOPMENT APPLICATION - DECISION OF COUNCIL

At the Council meeting on 20/ 9/76 the application described below was considered with the result that the application

has received UNCONDITIONAL CONSENT
received ~~CONDITIONAL CONSENT~~ *see note re Appeal.
been ~~REFUSED~~ *see note re Appeal.

under the provisions of ~~Interim Development Order No 1 Shire of Gudgegong~~
Mudgee Planning Scheme.

Conditions of Consent are .....

.....

.....

.....

Reasons for Conditions/Refusal are .....

.....

.....

.....

This consent shall be void if the development is not substantially commenced within twelve months, provided that Council may grant annual extension up to a further period of three years, if good cause be shown.

Details of Application dated 9/8/76

Site of Development ...127 Gladstone Street, MUDGEE.....

.....

.....

Details of Development Re-open the general mixed business.

.....

.....

.....

NOTE : Right of appeal against Council's decision to impose conditions or to refuse consent exists to the Local Government Appeals Tribunal under the Local Government Act, 1919, vide Section 342(V)(5(b)) for the Interim Development Order or Section 342(N)(2) for the Planning Scheme

Applicant J.E. Yavion & T. Fraser,
Lawsons Creek,
MUDGEE, 2850

Date of Issue .....

Planning Committee : 6.9/76

Council Minute : 953

Register Entered : 21/9/76

Consent extended to :

Application Fee $20

Rec. No. 2054 (20/ 9/76)

Parish Map Charted :

Mudgee 100ft. Charted:

Application No. 6.9/76 - From J.E. Yavion & T. Fraser

Application for development consent to re-open the general mixed business at 127 Gladstone Street, Mudgee.

The area is zoned as Residential A, in which the operation of a General Store is a permissable useage.

The application is recommended for approval.

barnson.

APPENDIX C

Chain of Custody and Laboratory Report

Environmental Division
Mudgee
Work Order Reference
ME2400480

barnson

Unit 4 / 108-110 Market Street
Mudgee, NSW 2850

1300 BARNSON (1300 227 676)

generalenquiry@barnson.com.au

Telephone : 02 6372 6735

CHAIN OF CUSTODY AND ANALYTICAL REQUEST

Job Number	43539	Date	12 March 2024
Laboratory	ALS Mudgee	Report to	Nardus Potgieter npotgieter@barnson.com.au
Sample Temperature on Receipt		Notes	

Sample ID	Sample Description	Sample Date	Sample type	Analysis request				
				1	2	3	4	5
TP-01	Surface soil	11/03/2023	Soil	X				
TP-02	Surface soil	11/03/2023	Soil	X				
TP-03	Surface soil	11/03/2023	Soil		X			
TP-04	Surface soil	11/03/2023	Soil		X			
TP-05	Surface soil	11/03/2023	Soil		X			
TP-03a	Surface soil	11/03/2023	Soil			X		
TP-04a	Surface soil	11/03/2023	Soil			X		
S-1	Cement Sheet Fragment	11/03/2023	Bulk solid				X	
S-2	Cement Sheet Fragment	11/03/2023	Bulk solid				X	
S-3	Cement Sheet Fragment	11/03/2023	Bulk solid				X	
S-4	Cement Sheet Fragment	11/03/2023	Bulk solid				X	
S-5	Cement Sheet Fragment	11/03/2023	Bulk solid				X	
S-6	Cement Sheet Fragment	11/03/2023	Bulk solid				X	

Analysis request		Method Code
1	TRH (C6-C40) / BTEXN / PAH / OC / PCB / 8 Metals	S-8
2	TRH (C6-C40) / BTEXN / PAH / 8 Metals	S-26
3	Asbestos – in 50g Soil (Grab sample) presence for free fibres	EA200G
4	Asbestos – in Bulk Solids	EA200B
5		

CERTIFICATE OF ANALYSIS

Work Order	: **ME2400480**	Page	: 1 of 11
Client	: **BARNSON**	Laboratory	: Environmental Division Mudgee
Contact	: Nardus Potgieter	Contact	: Mary Monds (ALS Mudgee)
Address	: Unit 4 108-110 Market Street MUDGEE NSW 2850	Address	: 1/29 Sydney Road Mudgee NSW Australia 2850
Telephone	: 0429 464 067	Telephone	: +61 2 6372 6735
Project	: Soil	Date Samples Received	: 12-Mar-2024 14:15
Order number	: ----	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: ----	Issue Date	: 19-Mar-2024 11:52
Sampler	: Client Sampler		
Site	: ----		
Quote number	: SY/053/14		
No. of samples received	: 13		
No. of samples analysed	: 13		

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
- Descriptive 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*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, 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), Dibenz(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.
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above 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.
- **EA200 Legend**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Analysis of asbestos from swabs and tapes is not covered under the current scope of NATA accreditation.
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
- EA200: N/A - Not Applicable

Analytical Results

Sub-Matrix: MATERIAL (Matrix: SOLID)			Sample ID	S-1 Cement Sheet Fragment	S-2 Cement Sheet Fragment	S-3 Cement Sheet Fragment	S-4 Cement Sheet Fragment	S-5 Cement Sheet Fragment
			Sampling date / time	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00
Compound	CAS Number	LOR	Unit	ME2400480-008	ME2400480-009	ME2400480-010	ME2400480-011	ME2400480-012
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	No	Yes	Yes	Yes	Yes
Asbestos Type	1332-21-4	-	--	-	Ch	Ch	Ch	Ch
Asbestos (Trace)	1332-21-4	-	-	No	N/A	N/A	N/A	N/A
Sample weight (dry)	----	0.01	g	7.80	3.72	2.65	17.5	8.69
Synthetic Mineral Fibre	----	-	-	No	No	No	No	No
Organic Fibre	----	-	-	Yes	No	Yes	No	No
APPROVED IDENTIFIER:	----	-	--	J. PAGE	J. PAGE	J. PAGE	J. PAGE	J. PAGE

Analytical Results

Sub-Matrix: MATERIAL (Matrix: SOLID)			Sample ID	S-6 Cement Sheet Fragment	----	----	----	----
			Sampling date / time	11-Mar-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ME2400480-013	--------	--------	--------	--------
				Result	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	**Yes**	----	----	----	----
Asbestos Type	1332-21-4	-	--	**Ch**	----	----	----	----
Asbestos (Trace)	1332-21-4	-	-	**N/A**	----	----	----	----
Sample weight (dry)	----	0.01	g	**9.11**	----	----	----	----
Synthetic Mineral Fibre	----	-	-	**No**	----	----	----	----
Organic Fibre	----	-	-	**No**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	**J. PAGE**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01 Surface soil	TP-02 Surface soil	TP-03 Surface soil	TP-04 Surface soil	TP-05 Surface soil
				Sampling date / time	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400480-001	ME2400480-002	ME2400480-003	ME2400480-004	ME2400480-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**16.5**	**8.9**	**5.9**	**3.8**	**3.2**
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**9**	**7**	**7**	**11**	**10**
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**18**	**14**	**20**	**24**	**20**
Copper	7440-50-8	5	mg/kg		**48**	**34**	**35**	**33**	**28**
Lead	7439-92-1	5	mg/kg		**196**	**119**	**215**	**201**	**91**
Nickel	7440-02-0	2	mg/kg		**10**	**9**	**10**	**10**	**10**
Zinc	7440-66-6	5	mg/kg		**603**	**722**	**366**	**326**	**171**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		**0.6**	**0.3**	**0.5**	**0.4**	**0.2**
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01 Surface soil	TP-02 Surface soil	TP-03 Surface soil	TP-04 Surface soil	TP-05 Surface soil
				Sampling date / time	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400480-001	ME2400480-002	ME2400480-003	ME2400480-004	ME2400480-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		**0.7**	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		**1.9**	**0.6**	**0.6**	**0.5**	<0.5
Pyrene	129-00-0	0.5	mg/kg		**1.9**	**0.6**	**0.6**	**0.6**	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		**1.1**	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		**1.1**	<0.5	**0.5**	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**1.3**	<0.5	**0.7**	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**1.1**	<0.5	**0.6**	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01 Surface soil	TP-02 Surface soil	TP-03 Surface soil	TP-04 Surface soil	TP-05 Surface soil
				Sampling date / time	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400480-001	ME2400480-002	ME2400480-003	ME2400480-004	ME2400480-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**9.1**	**1.2**	**3.0**	**1.1**	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**1.4**	<0.5	**0.7**	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**1.6**	**0.6**	**1.0**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**2.0**	**1.2**	**1.3**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	**110**	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	**110**	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**160**	**130**	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**160**	**130**	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP-01 Surface soil	TP-02 Surface soil	TP-03 Surface soil	TP-04 Surface soil	TP-05 Surface soil
				Sampling date / time	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00	11-Mar-2024 00:00
Compound	CAS Number	LOR	Unit		ME2400480-001	ME2400480-002	ME2400480-003	ME2400480-004	ME2400480-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**111**	**107**	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**118**	**105**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**96.5**	**94.6**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**101**	**103**	**96.4**	**103**	**99.3**
2-Chlorophenol-D4	93951-73-6	0.5	%		**99.0**	**100**	**95.3**	**101**	**95.1**
2.4.6-Tribromophenol	118-79-6	0.5	%		**81.3**	**78.1**	**76.1**	**78.3**	**74.4**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**101**	**95.5**	**101**	**101**	**104**
Anthracene-d10	1719-06-8	0.5	%		**104**	**104**	**102**	**109**	**105**
4-Terphenyl-d14	1718-51-0	0.5	%		**105**	**106**	**103**	**109**	**105**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**83.3**	**84.9**	**82.7**	**96.1**	**86.1**
Toluene-D8	2037-26-5	0.2	%		**87.2**	**89.5**	**88.0**	**106**	**91.8**
4-Bromofluorobenzene	460-00-4	0.2	%		**91.1**	**90.3**	**88.1**	**105**	**94.1**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP-03a Surface soil	TP-04a Surface soil	----	----	----
			Sampling date / time	11-Mar-2024 00:00	11-Mar-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ME2400480-006	ME2400480-007	--------	--------	--------
				Result	Result	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	----	----	----
Asbestos (Trace)	1332-21-4	-	-	**No**	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	**-**	----	----	----
Sample weight (dry)	----	0.01	g	**225**	**272**	----	----	----
APPROVED IDENTIFIER:	----	-	--	**B.SCHRADER**	**B.SCHRADER**	----	----	----
Synthetic Mineral Fibre	----	-	--	**No**	**No**	----	----	----
Organic Fibre	----	-	--	**No**	**No**	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **MATERIAL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	S-1Cement Sheet Fragment - 11-Mar-2024 00:00	Two pieces of cement sheeting.
EA200: Description	S-2Cement Sheet Fragment - 11-Mar-2024 00:00	One piece of asbestos cement sheeting approximately 30 x 20 x 5mm.
EA200: Description	S-3Cement Sheet Fragment - 11-Mar-2024 00:00	One piece of asbestos cement sheeting approximately 30 x 10 x 5mm and one piece of cement sheeting.
EA200: Description	S-4Cement Sheet Fragment - 11-Mar-2024 00:00	One piece of asbestos cement sheeting approximately 50 x 30 x 5mm.
EA200: Description	S-5Cement Sheet Fragment - 11-Mar-2024 00:00	One piece of asbestos cement sheeting approximately 50 x 20 x 5mm.
EA200: Description	S-6Cement Sheet Fragment - 11-Mar-2024 00:00	One piece of asbestos cement sheeting approximately 50 x 40 x 5mm.

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	TP-03aSurface soil - 11-Mar-2024 00:00	A soil sample.
EA200: Description	TP-04aSurface soil - 11-Mar-2024 00:00	A soil sample.

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
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

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

(SOLID) EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP080: BTEXN

(SOIL) EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions

(SOIL) EP080S: TPH(V)/BTEX Surrogates

(SOIL) EP075(SIM)B: Polynuclear Aromatic Hydrocarbons

(SOIL) EP075(SIM)S: Phenolic Compound Surrogates

(SOIL) EP075(SIM)T: PAH Surrogates

(SOIL) EG005(ED093)T: Total Metals by ICP-AES

(SOIL) EG035T: Total Recoverable Mercury by FIMS

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

(SOIL) EP080/071: Total Petroleum Hydrocarbons

(SOIL) EP066: Polychlorinated Biphenyls (PCB)

(SOIL) EP066S: PCB Surrogate

(SOIL) EP068A: Organochlorine Pesticides (OC)

(SOIL) EP068T: Organophosphorus Pesticide Surrogate

(SOIL) EP068S: Organochlorine Pesticide Surrogate