Preliminary Site Investigation
Planning Proposal

Location:

Lot 42 DP 868366 & Lot 1 DP 957677
1055 Bruxner Highway
Goonellabah NSW

Prepared for:

Nimble Estates Pty Ltd

Report No:

HMC2022.1106

September 2022

HMC environmental consulting pty ltd

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RE: Lot 42 DP 868366 & Lot 1 DP 957677, 1055, Bruxner Highway, Goonellabah NSW.

HMC Environmental Consulting Pty Ltd is pleased to present our report for a Preliminary Site Investigation for the abovementioned site.

We trust this report meets with your requirements. If you require further information, please contact HMC Environmental Consulting directly on the numbers provided.

Yours sincerely

Mark Tunks
(B.App.Sc.Env.Hlth)

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EXECUTIVE SUMMARY

Background

A Planning Proposal for the rural landholding located at 1055 Bruxner Highway, Goonellabah NSW, would amend the *Lismore Local Environmental Plan 2012* (LLEP) to enable mixed use development including residential, commercial, industrial and public open space land use within the site. HMC Environmental Consulting (HMC) was commissioned to undertake the required investigation to address potential site contamination, associated with current and former land use, in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP 2021)*.

A Preliminary Site Investigation (PSI) including a desktop assessment of available information, and a detailed site inspection indicated that several historic structures including dilapidated dwellings (2), outbuildings, dairy and farm storage sheds are existing on the northern, elevated part of the site, proposed for residential land use. Given the age of these dilapidated structures, there is potential that the surrounding soil may have been impacted by bonded asbestos containing material (ACM) fragments and lead from historic building materials. A number of the non-residential structures may have also been used for the bulk storage of agricultural chemicals or fuel, which is a potentially contaminating activity.

A Soil and Analysis Quality Plan (SAQP) was developed for the investigation area. Surface soil samples were collected, and subject to laboratory analysis for concentrations of potential contaminants of concern (PCoC). Bulk samples of suspect bonded ACM were also collected on and around several structures.

Objectives

The objectives of the Preliminary Site Investigation are to:

1. Assess the current and former land use on the property for potentially contaminating activities.
2. If potentially contaminating activities are identified, undertake a preliminary soil investigation to assess the suitability of the site for the proposed land uses within the planning proposal.

Scope Of Works

The scope of work undertaken during the investigation included the following:

- A desktop assessment of current and former land use on the site including search of available records including previous site investigations.
- A detailed site inspection.
- Soil Investigation
    - **Round 1** - Collection of 22 primary soil samples + 4 x QA/QC soil samples around the existing structures, and laboratory analysis for potential contaminants of concern (PCoC) including total metals, organochlorine/organophosphorus chemicals, and petroleum hydrocarbons (non-residential suspect structures);
    - **Round 2** - Collection of 20 primary soil samples + 2 x QA/QC soil samples around the identified lead-impacted soil locations and historic demolished farm shed location, and laboratory analysis for total metals, organochlorine/organophosphorus chemicals and petroleum hydrocarbons;
- Preparation of a Preliminary Site Investigation report including:
    - detailed site history;
    - location of sampling locations;
    - sampling method, QA/QC
    - assessment of laboratory results;
    - conclusions and recommendations, including suitability of the site for the planning proposal, and need for further investigation and remediation.

Conclusion/Recommendations Summary

The Preliminary Site Investigation conclusions are based on the information described in this report and Appendices and should be read in conjunction with the complete report, including Section 14 Limitations.

A Planning Proposal for the rural landholding located at 1055 Bruxner Highway, Goonellabah NSW, is proposed to amend the *Lismore Local Environmental Plan 2012* (LLEP) to enable mixed use development including residential, commercial, industrial and public open space on the land. A Preliminary Site Investigation (PSI), including a desktop assessment of available information, and a detailed site inspection, indicated the property was used as a dairy and for cattle grazing since at least prior to 1942. There are a number of existing structures and a demolished structure location, found on the northern part of the site, however, which given their apparent age, potentially contain historic hazardous building materials. Due to their dilapidated state and weathering, these materials may have caused contamination to the surrounding soils. The non-residential structures may also have been associated with the storage/mixing/spillage of agrichemicals and fuel.

A Soil and Analysis Quality Plan was prepared, and implemented, to assess total soil concentrations of potential contaminants of concern including pesticides, metals and petroleum hydrocarbons, in the immediate surrounds of the structures. Laboratory results recorded generally all organochlorine and organophosphorus chemicals, and petroleum hydrocarbons, below the laboratory level of reporting (LOR) and, therefore, below the investigation criteria. Other metal results were typical of background levels. A single total chromium result, exceeded the speciated chromium (VI) criteria, however, it is unlikely chromium (VI) would be associated with this land use.

Elevated lead results were recorded in a number of locations across the site which exceeded the investigation criteria. Although additional soil investigation delineated some of the locations additional future investigation would be required prior to any remediation associated with a development application.
The identified lead-impacted soil and bonded asbestos containing material is located in surface soil around the existing structures on the northern part of the site, and any future remediation of the small areas of concern would be able to be managed effectively, with remediation options including reinterment on site, or removal off-site to an approved facility.

Based on the information presented, in relation to potential site contamination associated with the current and former land use, the proposed Planning Proposal site, located on Lot 42 DP 868366 & Lot 1 DP 9576771055, 1055 Bruxner Highway, Goonellabah NSW, as shown in Appendix 2 & 3 of this report, is considered suitable for the proposed future mixed use development subject to:

1. Prior to the submission of a development application for development in the area shown as AoC 1 and AoC 2 in this report, a Detailed Site Investigation is to be prepared by a suitably qualified environmental consultant to further delineate the potential contaminants of concern identified in and around the existing dwellings and associated structures.

2. Following the preparation of the Detailed Site Investigation in 1 above, a Remedial Action Plan is to be prepared providing details on required remediation and validation of lead-impacted soil and other identified potential contaminants of concern.

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Abbreviations/acronyms

ACM	Asbestos containing material
ANZECC	Australian and New Zealand Environment and Conservation Council
AOC	Area of Concern
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
AS	Australian Standard
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013)
Client	Nimble Estates Pty Ltd
CLM Act	*Contaminated Land Management Act 1997*
CSM	Conceptual site model
DQO	Data quality objective
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
ERA	Environmental Risk Assessment
HIL	Health investigation Level
HMC	HMC Environmental Consulting
LLEP 2012	Lismore Local Environmental Plan 2012
LOR	Laboratory Limit of Reporting
mBGL	Metres below ground level
OEH	[NSW] Office of Environment and Heritage
PCoC	Potential Contaminant of Concern
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RL mAHD	Reduced Level Metres Australian Height Datum
SAQP	Sampling and analysis quality plan
Site	Lot 42 DP 868366 & Lot 1 DP 957677, 1055, Bruxner Highway, Goonellabah NSW

1 INTRODUCTION

1.1 Background

A Planning Proposal for the rural landholding located at 1055 Bruxner Highway, Goonellabah NSW, would amend the *Lismore Local Environmental Plan 2012* (LLEP) to enable mixed use development including residential, commercial, industrial and public open space land use within the site. HMC Environmental Consulting (HMC) was commissioned undertake the required investigation to address potential site contamination, associated with current and former land use, in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP 2021)*.

A Preliminary Site Investigation (PSI) including a desktop assessment of available information, and a detailed site inspection indicated that several historic structures including dilapidated dwellings (2), outbuildings, dairy and farm storage sheds are existing on the northern, elevated part of the site, proposed for residential land use. Given the age of these dilapidated structures, there is potential that the surrounding soil may have been impacted by bonded asbestos containing material (ACM) fragments and lead from historic building materials. A number of the non-residential structures may have also been used for the bulk storage of agricultural chemicals or fuel, which is a potentially contaminating activity.

A Soil and Analysis Quality Plan (SAQP) was developed for the investigation area. Surface soil samples were collected, and subject to laboratory analysis for concentrations of potential contaminants of concern (PCoC). Bulk samples of suspect bonded ACM were also collected on and around several structures.

1.2 Project Description

The Planning Proposal includes amending the LLEP 2012 for the rural property located at 1055 Bruxner Highway, Goonellabah NSW. The site is currently mapped as Primary Production (RU1) land, and is proposed to be rezoned to allow for a future mixed-use subdivision including residential, commercial, industrial, and public open space lots. An indicative layout plan of the future development is included in **Appendix 3**.

The property is currently used for livestock grazing, with a number of dilapidated, abandoned structures existing onsite, including two dwellings (dwelling No 1 to the south and No 2 to the north), and former farming structures, all located on the northern portion of the property, accessible via the Bruxner Highway. The remainder of the property is currently primarily cleared grazing land with pasture grass and scattered vegetation.

1.3 Objective of the Investigation

The objectives of the Preliminary Site Investigation are to:

1. Assess the current and former land use on the property for potentially contaminating activities.
2. If potentially contaminating activities are identified, undertake a preliminary soil investigation to assess the suitability of the site for the proposed land uses within the planning proposal.

1.4 Scope Of Works

The scope of work undertaken during the investigation included the following:

- A desktop assessment of current and former land use on the site including search of available records including previous site investigations.
- A detailed site inspection.
- Soil Investigation
    - **Round 1** - Collection of 22 primary soil samples + 4 x QA/QC soil samples around the existing structures, and laboratory analysis for potential contaminants of concern (PCoC) including total metals, organochlorine/organophosphorus chemicals, and petroleum hydrocarbons (non-residential suspect structures);

- **Round 2** - Collection of 20 primary soil samples + 2 x QA/QC soil samples around the identified lead-impacted soil locations and historic demolished farm shed location, and laboratory analysis for total metals, organochlorine/organophosphorus chemicals and petroleum hydrocarbons;

- Preparation of a Preliminary Site Investigation report including:
  - detailed site history;
  - location of sampling locations;
  - sampling method, QA/QC
  - assessment of laboratory results;
  - conclusions and recommendations, including suitability of the site for the planning proposal, and need for further investigation and remediation.

2 SITE IDENTIFICATION

Table 1 - Site Identification Summary

Street Address		1055 Bruxner Highway, Goonellabah NSW
Allotment size		75.24 Hectares
Allotment Description		Lot 42 DP 868366 & Lot 1 DP 957677
Property No.		26279 & 20265
Local Government		Lismore City
Parish		Lismore
County		Rous
Geographical Coordinates (MGA Zone 56)		Easting: 6812109.65 m E Northing: 534663.79 m S (Approximate centre of site).
Existing Zoning (LLEP)		RU1 Primary Production
Land use - Existing		Agricultural – Livestock Grazing
Land use - Proposed		Mixed-use including residential, commercial, industrial & public open space
Site Services		Power
Surrounding land uses	**North**	Bruxner Highway, Agricultural (macadamia orchard), residential
	East	Agricultural (livestock grazing, macadamia orchard), rural living
	South	Agricultural (livestock grazing, macadamia orchard), residential
	West	Commercial/industrial, agricultural (livestock grazing), residential
Closest Sensitive Environment		South of Bruxner Highway an east-west drainage line bisects the site collecting site drainage and directing it west into the ephemeral Tucki Tucki Creek. North of the Bruxner Highway the site drainage is directed south and west and is collected via the street stormwater system.

Table 2 – Site Characteristics

Topography	The property is undulating, with moderate to steep sloping in areas, particularly towards Tucki Tucki Creek bisecting the centre of the property. The elevation is approximately 145m – 189m across the property. (ELVIS - https://elevation.fsdf.org.au/)
Regional Geology (Hashimoto el al 2008)	**Cenozoic Mafic Volcanic Rocks** Rocks which erupted from widespread volcanic activity over the last 65 million years (Tweed Volcano). Includes basalt flows and eruptive products associated with the volcano.
Soil Landscape (Morand, 1996)	**Wollongbar (wo) soil landscape (Expected)** Rolling and undulating hills on plateau surfaces of the Lismore Basalts. Soils are expected to be mostly deep well-drained Krasnozems with shallower stoner Krasnozems on crest/upper slope boundaries and Wet alluvial Krasnozems in drainage lines.
Australian Soil Classification https://www.environment.nsw.gov.au/eSpade2Webapp	**Ferrosols (FE)** Soils with B2 horizons which are high in free iron oxide, and which lack strong texture contrast between A and B horizons These soils are almost entirely formed on either basic or ultrabasic igneous rocks, their metamorphic equivalents, or alluvium derived therefrom.

	Although these soils do not occupy large areas in Australia, they are widely recognised and often intensively used because of their favourable physical properties.
Regional Hydrogeology	Groundwater vulnerability is not mapped for the site. Groundwater flow would be expected to reflect surface flows with gradients towards the north away from the elevated areas to the south. The groundwater would be expected to be shallow (<5m) in areas of the undulating land.
Groundwater Database Search	The online NSW Office of Water groundwater mapping (http://allwaterdata.water.nsw.gov.au/water.stm) shows the nearest registered groundwater bore is GW052458, greater than 250m east of the site. The bore is registered for domestic use.

3 SITE HISTORY

3.1 Ownership

The property is currently owned by Nimble Estates Pty Ltd. A review of the title information via the online Land and Property Information portal on 22 August 2022 provides the following information:

Folio Description	Date of Folio	Search Date	Ownership Details
42/868366	19/4/2022	22/8/2022	Nimble Estates Pty Ltd

3.2 Aerial Photograph Interpretation

A summary of the available historic aerial photography is shown in table 3.

Table 3 – Aerial Summary

Year	Source	Comments	Areas of Potential Concern Yes/No
1958	NSW Government (Historical Imagery) [1]	The property appears to be clear of native vegetation, with only scattered trees remaining. The site is clear of any cropping, plantations other intensive land uses, most likely used for livestock grazing. Both of the existing dwellings (now dilapidated) are visible. Numerous other structures also appear to be existing, including the garage, shed and previously demolished store shed at dwelling No 1, and the outhouse/laundry at dwelling No 2 (see Appendix 12 & 13). The surrounding area also appears to have been generally cleared of native vegetation, with scattered structures visible along the now Bruxner Highway.	YES Potential contamination due to hazardous historic building materials in aging structures. Potential storage of agrichemicals and fuel in numerous existing structures.
1971		Similar to 1958. The existing dairy bales are visible adjacent to dwelling No 2. The property remains clear of any visible intensive land uses. There is increased vegetation around the structures.	
1979		Similar to 1971.	
1987		Similar to 1987. The adjoining property to the east has now been planted out as a macadamia orchard.	
1991		Similar to 1987.	
1997		Similar to 1991. The existing carport at dwelling No 2 is now visible. The adjoining land to the west has begun to be developed into residential housing. The adjoining property to	

		the south has been planted out as a macadamia orchard.	
2009-2015	Google Earth	The are no visible changes noted to the structures on site. The property remains clear of any visible intensive agricultural land uses. Scattered vegetation remains on the property. The land to the west has generally been developed into residential and commercial properties.	
2016 – 2022		The store shed appears to have now been demolished. Some vegetation has been cleared around the existing structures and on the southwest corner of the property. No other significant changes were noted in subsequent years.	

(1) https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb

Table 4 – Statutory Searches

Search	Comment
NSW EPA Contaminated Land Public Record http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx	No records (orders, notices) for the site were discovered.
Australian Department of Defence Unexploded Ordinance Contaminated Sites http://www.defence.gov.au/uxo/where_is_uxo/UXOSearch.asp?State=NSW	No UXO sites are recorded in close proximity to the subject site.
Cattle dip site locator http://www.dpi.nsw.gov.au/agriculture/livestock/health/specific/cattle/ticks/cattle-dip-site-locator	The nearest mapped cattle dip site is Alphadale Dip (Demolished), located greater than 680m east of the site.

3.3 Historic Parish Maps & Topographic Maps

A summary of the available historic parish and topographic mapping information is shown in table 5.

Table 5 - Historic Parish and Topographic Map Summary

Search	**Comment**
Historic parish maps 1914, 1926 & 1940 http://images.maps.nsw.gov.au/pixel.htm	Maps do not record land use. Lismore parish maps 1914 to 1940 show the property as part of the historic portions 196 (78 acres), 241 (42 acres) and 236 (100 acres). No changes noted during this period.
Topographic maps • *Australian Section of the Imperial General Staff (1942), N°245 Zone 8 Lismore, Topographic Map*	The topographic map shows a single structure on the property with scattered timber mapped over the property. Non-perennial streams are mapped flowing towards the centre of the property. No other land uses are mapped.
• *NSW Land & Property Information (2011), 1:25000 9540-2N Lismore, Topographic Map*	Four structures are mapped on the property with a vehicle track shown from the Bruxner Highway to the structures. Scattered patches of *open forest* are mapped on the property. Non-perennial streams are mapped flowing downslope towards the Tucki Tucki Creek.
• *NSW Land & Property Information (2016), 1:25000 9540-2N Lismore, GeoPDF Topographic Map*	Similar to 2011. Five structures are now mapped.

3.4 Previous Investigation

HMC previously prepared a Preliminary Site Investigation (**HMC2015.128**) for the property in 2015 for a previously rejected development proposal (**DA15/356**) including a service station, modular home estate and community farm. As part of this investigation, historic information was gathered from the council and previous owners. Lismore council confirmed that there were no building records or land contamination issues on file. Helen Tunks of HMC conducted an interview with former owner Robert Rose on the 8th of October 2015, whose family had originally established the farm. The information gathered at that time is summarised below:

- Mr Rose sold the farm in November 2014.
- Mr Rose's grandfather bought the property around 1910 and cleared the land for dairying.
- The property was then passed on to Mr Rose's father and then onto himself.
- The property was generally used for dairying up until approximately 50 years ago and cattle grazing since that time.
- There are two dwellings on the property
- The existing former dairy is located near the southern dwelling (Dwelling No 1) and was built around 1955.
- The farm has never been used for sugar cane cultivation or bananas.
- No cattle dip site on the farm.
- No structures on Lot 1.
- No bulk fuel or chemical storage areas
- Not aware of any potentially contaminating activities on the farm.

The HMC report concluded that no potentially contaminating activities had occurred on the property since it was cleared of native vegetation until the time of reporting. It noted the presence of asbestos containing material (ACM) in the existing structures and provided the recommendation that:

"Prior to demolition of the dwellings on Lot 42 DP 868366 1055 Bruxner Highway Goonellabah, a Workcover NSW licensed contractor remove any hazardous waste including asbestos containing material from the structures and dispose of the material in accordance with Workcover NSW and Lismore City Council requirements".

3.5 Summary

Historic aerial photography and topographic mapping show the property, and the surrounding area, generally cleared of native vegetation prior to 1942. The presence of the dairy bales on site, as well as anecdotal evidence provided by a previous owner, indicates that the property was established as a dairy farm in the early 1900s and has been used for dairying and cattle grazing in the years since. There was no evidence discovered that indicated that any cropping or plantations had existed on the site.

The existing structures, including both dwellings, are visible in the 1958 historic aerial photograph with no notable changes to the structures (other than dilapidation) discovered since. The farm storage shed was demolished prior to 2016. Hazardous materials may have been used in the construction of these historic structures, including lead paint, and bonded ACM.

The investigation area is within the increasingly developed Goonellabah area, and was generally cleared of native vegetation prior to 1958. Large portions of the surrounding properties, particularly to the east and south, have been planted out as macadamia orchards since prior to 1987. Development has also increased in subsequent years, particularly to the west, including Goonellabah's industrial area.

4 SITE CONDITION

4.1 Summary of Site Conditions

A site inspection was completed on 5th August 2022 by Mark Tunks, Matthew Flanagan and Taylah Richards of HMC, during the soil investigation (Round 1), and again on 5th September 2022 by Matthew Flanagan during the additional soil sampling (Round 2). The property was accessible via the Bruxner Highway to the north. A vehicle track is existing extending from the northern boundary to the existing structures on the northern portion of the

site. There are two existing dwellings on the property. The northern dwelling (No 2) is a weatherboard structure with an outhouse/laundry structure existing to the south, as well as an open carport structure adjacent. The southern weatherboard dwelling (No 1) had numerous structures existing surrounding it, including a garage to the north, two sheds to the east and dairy bales to the southeast. A stockpile of building materials remains on the site of the previously demolished farm storage shed to the southwest of dwelling No 1. All existing structures have been disused, and are in a state of severe disrepair.

The property is undulating, with steep to moderate slopes grading towards the Tucki Tucki Creek which is transecting through the centre of the property. Scattered vegetation is existing on the property, particularly around the existing structures. The remainder of the site is generally pasture grass cover. Cattle are present on the property.

4.2 Surrounding Environment and Land Use

The investigation area is located within the increasingly developed area of Goonellabah. Residential and commercial/industrial development is existing to the west, while the south and east remains agricultural. The adjoining properties to the east and south have been planted out as macadamia orchards.

4.3 Site photographs

See Appendix 11.

4.4 Site Features

The details of the site inspections are shown in table 6.

Table 6 - Site Inspection Features and Potential Contamination Indicators

Features of Contamination	Comments
Disturbed, discoloured or stained soil	No disturbed, discoloured, or stained soil noted.
Disturbed or distressed vegetation	No disturbed or distressed vegetation.
Surface water quality	Tucki Tucki Creek appears to have been of good water quality.
Agrichemical Storage/Use	None recorded on the property.
Other chemical/fuel storage	None recorded.
Waste storage	None recorded.
Asbestos Waste or Use in Structures	Bonded ACM may be present in the eaves soffit, and internal linings to the dwellings. Lead flashing and paint may also be present.
Fill from unapproved source	None recorded.
Blue bags, trellises or cropping contours	No blue bags, cropping contours or trellis remnants were recorded.

5 IDENTIFIED AREAS OF CONCERN AND POTENTIAL CONTAMINANTS OF CONCERN

Historic aerial photography and topographic mapping show the property and surrounding area generally cleared of native vegetation prior to 1942, with scattered mature vegetation remaining. The property was apparently historically used as a dairy farm, and has only been used for cattle grazing in recent years. There was no evidence of cropping or plantations having ever occurred on the site.

The existing structures are located on the northern portion of the site. They appear to be present in the 1958 historic aerial photography with only the farm storage shed demolished in subsequent years. Given the age of the structures, hazardous building materials may have been used in their construction, including bonded ACM and lead paint. Yellow and blue-coloured paint within the dwellings was typical of leaded paint material. Evidence of both were noted during the detailed site inspection. Given the state of disrepair the structures are in, and the weathering which has occurred, these materials may be present in the surrounding soil.

A number of outbuildings and farm sheds are located around the two existing dwellings on the northern part of the large agricultural farm. Several of these structures may have potentially been used for the bulk storage of agricultural chemicals and fuel. This is also a potentially contaminating activity.

The identified areas of concern (AoC) relate to the existing disused and dilapidated structures, and include the two existing dwellings. The two AoC are located on the northern elevated part of the property with extensive buffers to any sensitive receivers.

AoC 1 – Existing dwelling No 1 with associated garage, outbuildings, former dairy, demolished farm storage shed
AoC 2 – Existing dwelling No 2 with associated laundry and carport

The potential contaminants of concern (PCoC) would be:

- bonded ACM fragments, and flaked lead paints particles from cladding and linings, generally associated with the existing dwellings
- organochlorine/organophosphorus chemicals, petroleum hydrocarbons, and metals associated with storage/mixing areas around existing and former farm storage sheds

6 APPLICABLE INVESTIGATION LEVELS AND INVESTIGATION CRITERIA

6.1 Soil Criteria

The planning proposal would increase the number of persons using the property. Currently the site is used for cattle grazing.

The proposal would allow for residential, commercial, industrial and recreational development which would include exponentially increase the occupancy of the property, and therefore, the potential exposure to PCoC would be increased. Final exposure would depend on the soil concentrations of PCoC, and the likely use of the land in the vicinity of any areas of concern (AoC).

The location of the AoC is proposed for future residential development, and, therefore, the applicable exposure settings for potential exposure of persons to soil and soil disturbance associated with the potential land use for this initial Tier 1 assessment are:

- **Health investigation level (HIL A)** residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools.
- **Ecological investigation level (EIL)** Urban residential/public open space is broadly equivalent to the HIL A, HIL B and HIL C land use scenarios.
- **Health Screening Levels (HSL A)** Low - high density residential (assessing fuel/oil contaminants only)
- **Ecological Screening Level (ESL)** Urban residential areas and public open space (assessing fuel/oil contaminants only)

The following guidance notes were considered in the preparation of this report:

- *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (April 2013), EPHC 2013, Canberra.
  (Schedule B)
  - *(1) Guidelines on the Investigation Levels for Soil and Groundwater, and*
  - *(2) Guidelines on Site Characterisation*

In NSW the Measure is now being implemented by way of endorsement under section 105 of the Contaminated Land Management Act 1997. This will provide expanded technical guidance to site auditors, contaminated land consultants, planning authorities and the public when assessing a contaminated site.

- **NSW EPA (2022)** ***Sampling Design Guidelines*** – were followed during design of the sampling and analysis plan and predetermination of data quality objectives (DQOs).
- **SEPP (2021)** ***State Environmental Planning Policy (Resilience and Hazards)–*** provided guidance on project objectives.'
- **NSW EPA (2020) Consultants reporting on contaminated land - Contaminated land guidelines** were followed throughout the investigations and during preparation of this report

- **NSW DEC (2005*) Contaminated Sites - Guidelines for Assessing Former Orchards and Market Gardens* –** were used to assist in sampling and analysis plan and preliminary screening criteria

Table 7 - Investigation Criteria (Soil & Sediment)

Metals/Metalloids (mg/kg)	**HIL A (1)**	**EIL (2)**	**HSL (3)**	**ESL (4)**
Arsenic	100	100		
Chromium	100 (VI)	400 (III)		
Copper	6000	210		
Nickel	400	270		
Zinc	7400	270		
Cadmium	20			
Lead	300	1100		
Mercury (inorganic)	40			
Organochlorine/Organophosphorus Chemicals (mg/kg)				
Chlordane	50			
Dieldrin + Aldrin	6			
DDT+DDD+DDE	240			
Heptachlor	6			
Chlorpyrifos	160			
Endosulfan	270			
Endrin	10			
BTEX (mg/kg)				
Benzene			0.6	65
Toluene			480	105
Ethyl Benzene			NL	125
Total Xylenes			110	45
Total Petroleum Hydrocarbons (mg/kg)				
C6-C10			40	180
>C10-C16			230	120
>C16-C34				1300
>C34-C40				5600
Total >C10-C40				
Polyaromatic Hydrocarbons (mg/kg)				
Napthalene			4	170
Benzo-pyrene				0.7
Carcinogenic PAHs (as BaP TEQ)				
Total PAH				

(1) Health Investigation Levels for residential "A" land use (HIL A) as stated in Table 1A (1) of *Schedule B (1) Guideline of Investigation Levels for Soil and Groundwater* within the *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended and in force from 16 May 2013

(2) Ecological Investigation Levels (EILs) for Residential as stated in Tables 1B(1)-1B(5) of *Schedule B (1) Guideline of Investigation Levels for Soil and Groundwater* within the *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended and in force from 16 May 2013

(3) Health Screening Levels for clay in Tables 1A(3) of *Schedule B (1) Guideline of Investigation Levels for Soil and Groundwater* within the *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended and in force from 16 May 2013

(4) Ecological Screening Levels for clay in Tables 1B(6) of *Schedule B (1) Guideline of Investigation Levels for Soil and Groundwater* within the *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended and in force from 16 May 2013Ecological Screening levels

6.2 Relevant Environmental Media

Based on the site history, topography and soils, the relevant environmental media would generally be the surface soil on and around the existing, and previously demolished, structure locations. The soil surface is more likely to have been impacted by the former land use, and condition of the existing structures. The surface soil (topsoil) is likely to be disturbed during earthworks, and stripped for future use in landscaping preparation on the site. Surface soil might also be subject to movement due to erosion (rain) or wind (dust).

6.3 Investigation Criteria

The investigation criteria are based on the Health Investigation Level deemed relevant for the proposed land use in clay loam/clay soil found on the site. The Ecological Investigation Level applies to ecological receptors and is relevant in the upper 2m of the soil profile.

Groundwater was expected to be at greater than 5m depth near the elevated, northern part of the site. No groundwater investigation was completed during this preliminary investigation. If surface soil investigation recorded elevated PCoC then the groundwater regime would be further assessed and, if warranted, groundwater investigation including collection of representative samples would be implemented.

ASC NEPM (2013) recommends that "*at the very least, the maximum and the 95% UCL of the arithmetic mean contaminant concentration should be compared to the relevant Tier 1 screening criteria*" and also that" *the results should also meet the following criteria:*

- *the standard deviation of the results should be less than 50% of the relevant investigation or screening level, and*
- *no single value should exceed 250% of the relevant investigation or screening level*".

The 95% UCL of the arithmetic mean provides a 95% confidence level that the true population mean will be less than, or equal to, this value. The 95% UCL is a useful mechanism to account for uncertainty in whether the data set is large enough for the mean to provide a reliable measure of central tendency.

7 DATA QUALITY OBJECTIVES

- ***State the Problem***

- Potential soil contamination associated with
    - concentrations of PCoC associated with the use and degradation of hazardous building materials (visible bonded ACM, and lead paint soil concentrations) exceeding the investigation criteria around existing and demolished structures
    - concentrations of PCoC associated with chemical/fuel storage/use exceeding the investigation criteria in the immediate surrounds of non-residential existing and demolished structures.

- ***Identify the Decisions/Goals***

- Soil concentrations of PCoC to meet adopted investigation criteria based on future residential land use.

- ***Identify Information Inputs***

- Soil organochlorine, organophosphate, metals and petroleum hydrocarbons concentrations. Visible bonded ACM fragments.
- Sampling depth and location [0-150mm based on NSW EPA (1997) for disturbed areas]
- Soil texture.
- Field measurements - visual and olfactory
- Investigation criteria generally based on residential land use for clay (fine) soil (<2m depth) as shown in table 5

- ***Define the Study Boundaries***

- The initial investigation area is generally confined to the existing structures on site on the northern portion of the property. There are currently multiple historic structures on the site located where future residential land use is proposed as shown in Appendix 2 and 3 in this report. Targeted sampling around each of the structures was conducted in Round 1.
- Additional targeted sampling was completed in Round 2 to help delineate identified lead-impacted areas and in the location of a later identified demolished farm storage shed location from historic aerial photographs.

- ***Develop the Analytical Approach***

- If the results exceeded the investigation criteria, then the soil would require further investigation/remediation.
- If the results were below the investigation criteria, then the investigation area would be suitable for the proposed residential land use.

- ***Specify the Acceptance Criteria***
- Investigation criteria – 95% UCL < HIL & EIL, Standard Deviation <50% HIL & EIL, maximum <250% HIL & EIL. - see table 5
- ***Investigation Criteria***
- See table 5
- ***Optimise the Design***
- Vary design based on site conditions and results.

8 SAMPLING AND ANALYSIS PLAN AND SAMPLING METHODOLOGY

8.1 Sampling, analysis and data quality objectives

The following sampling, analysis and data quality objectives have been adopted for this site investigation:

- To collect a minimum number of soil samples across the investigation area (AoC 1 and AoC 2) and surrounds (includes former shed location) to assess those concentrations of PCoC meet the soil investigation criteria for the proposed land use.
- To employ quality assurance when sampling, assessing and during evaluation of the subject soils.
- To ensure that decontamination techniques are applied during the sampling procedure and that no cross contamination of samples occurs.

8.2 Soil Sampling and Analysis Program

A sampling and analysis quality plan (SAQP), and a sampling and analysis program, were developed to assess the site for PCoC associated with:

- concentrations of PCoC associated with the use and degradation of hazardous building materials (visible bonded ACM, and lead paint soil concentrations) exceeding the investigation criteria around existing and demolished structures
- concentrations of PCoC associated with chemical/fuel storage/use exceeding the investigation criteria in the immediate surrounds of non-residential existing and demolished structures.

Round 1
A targeted sampling approach was adopted. Twenty two (22) primary soil samples plus 4 x QA/QC's were collected from the two AoC that were located around the two existing dwellings with their associated structures. Samples of potential bonded ACM were also collected.

Round 2
Twenty (20) primary soil samples plus 2 x QA/QC's were collected to help delineate the identified lead-impacted soil areas and to assess the later identified location of a demolished farm storage shed near dwelling no. 1 (south)

Surface soil sampling was adopted as any soil exposure would be to the surface soil. The NSW EPA (1995) recommends 0-150mm sampling interval for disturbed areas.

Round 1 sampling was completed on 5 August 2022, and Round 2 was completed on 5 September 2022 as shown in Appendix 13.

The following basic measures were undertaken by HMC Environmental Consulting during each sampling round to conform to the minimum standards for field quality assurance and quality control procedures for the samples collected:

- Soil sampling was undertaken by M. Tunks, H. Tunks, M. Flanagan and T. Richards of HMC Environmental Consulting, with experience in site contamination investigations.
- Clean, dedicated, stainless-steel trowels were used to collect samples from immediately below the root zone and detritus layer, where present, (0-150mm) using disposable nitrile gloves.

- The trowels were decontaminated before sampling by pressure cleaning (12V) thoroughly with clean water, scrubbing with Decon 90 cleanser, and finally re-rinsing with clean water.
- Field quality assurance and quality control (QA/QC) protocols implemented included details of collection and analysis of field duplicate and triplicate samples.
- Chain of custody documentation was completed.
- The laboratory results and quality assurance and quality control reports including a description of the analytical methods used and reporting for surrogates was also completed.

9 QUALITY ASSURANCE AND QUALITY CONTROL

Sampling was undertaken in accordance with the SAQP (see section 8).

Table 8 – Soil Quality Control Samples

Primary Sample ID	Type	Quality Control Sample ID	Laboratory	Analytes
BH3A	Duplicate	BHDUP1	ALS, Brisbane	Metals (Lead)
	Triplicate	BHTRIP1	ALS, Sydney	
BH18A	Duplicate	BHDUP2	ALS, Brisbane	OCPs, OPPs, Metals, BTEX, TPHs, PAHs
	Triplicate	BHTRIP2	ALS, Sydney	
BH39A	Duplicate	BHDUP3	ALS, Brisbane	
	Triplicate	BHTRIP3	ALS, Sydney	

The laboratory results and quality control reports include a description of the analytical methods used and reporting for surrogates used by ALS Environmental.

Table 9 - Data Quality Indicators

Data quality indicator	Criteria	Comment
Precision		
Laboratory matrix duplicate relative percentage differences (RPDs) within criteria	Limits set by the laboratory: • Soil results <10 times the LOR: No limit • Soil results between 10-20 times the LOR: RPD must lie between 0-50% • Soil results >20 times the LOR: RPD must lie between 0-30%	Generally all soil results within prescribed limits
Field duplicate RPDs within criteria	In accordance with AS4482.1 (2005), RPD results ≥50% will be considered to exceed the data quality objectives (DQO) of the assessment. However, based on industry best practice, RPD results will be discounted if both sample results used to calculate the RPD are below the laboratory's limit of reporting (LOR) or less than 10 times the LOR.	Generally all <50% RPD or less than 10 times the LOR
Accuracy		
Matrix spike sample results reported with prescribed limits	Limits set by the laboratory: • Results to be between 70-130%.	Generally all results were between 70-130%
Surrogate spike sample results reported with prescribed limits	Limits set by the laboratory: • Recoveries must lie between 50-150%.	Surrogate spike sample results reported within the prescribed limits.
Laboratory method blanks reported with prescribed limits	Concentrations of targeted parameters should be below the laboratory's limit of reporting (LOR).	Laboratory method blanks reported with prescribed limits.
All analysis NATA	Analysis to be completed by a NATA accredited	All analysis NATA accredited

accredited	laboratory.	
Representativeness		
Samples delivered to laboratory within sample holding times, chilled and with correct preservative	Target temp <4°C. Samples to be submitted to the laboratory within the designated holding times. Different holding times exist for different parameters. Samples to meet the preservation requirements set by the laboratory.	Samples delivered to laboratory within sample holding times, chilled and with correct preservative
Required number of field duplicates and sample blanks taken	Intra and inter laboratory duplicates are to be collected at a ratio of one duplicate pair per 20 samples. One rinse blank and field blank to be collected per day as required. One trip blank to be collected per cooler where analysis of volatile compounds is proposed.	Required number of field duplicates and sample blanks taken Dedicated stainless steel trowels but rinsate collected prior to sampling to check HMC implement cleaning.
Sample blanks reported results below detection limits	Concentrations of targeted parameters to be below the laboratory's limit of reporting (LOR).	The sample blank results were below the LOR
Samples collected in accordance with regulatory and HMC procedures	Samples to be collected in general accordance with standard operating procedures (SOPs) which are based on applicable regulatory guidance and industry best practice.	Samples collected in accordance with regulatory and HMC procedures
Comparability		
Same standard operation procedures (SOPs) applied during each sampling event	The same SOPs to be adopted for each sampling event.	Same standard operation procedures (SOPs) applied during each sampling event
LORs below the adopted assessment criteria	The laboratory's LOR is to be below the adopted assessment criteria.	LORs below the adopted assessment criteria
LORs below the adopted assessment criteria	The sampler is to be a Suitably Qualified Person (SQP)	SQP collected samples
Same type of sample preservation and analysis techniques	The same type of sample preservation and analysis techniques are to be applied to all samples. This information is to be provided within laboratory reports.	Same type of sample preservation and analysis techniques applied to all samples
Completeness		
All laboratory data reviewed and presented in the report (i.e. COCs, SRNs, COAs and QCRs)	All information provided by the laboratory is to be provided in the final report.	All laboratory data reviewed and presented in the report
All sample results reported	All sample results are to be reported and discussed.	All sample results reported
Sample blanks data reported	All sample blank data is to be reported.	Sample blanks not required
Relative percent differences (RPDs) calculated	RPDs to be calculated for all sets of field duplicates.	Relative percent differences (RPDs) calculated
Laboratory duplicates reported	All laboratory duplicate results are to be reported.	Laboratory duplicates/triplicates reported
NATA stamp on reports	NATA stamps to be shown on all laboratory reports.	NATA stamp on reports

10 FIELD AND ANALYTICAL RESULTS

10.1 Fieldwork

Strategic field sampling was conducted by experienced environmental scientists on 5 August 2022 (Round 1) and 5 September 2022 (Round 2).

Table 10 – Sample Locations

Sampling	Primary Sample	Location	Depth (mm)	ID	Soil Description	Laboratory Program
Round 1	BH1A	Dwelling No 2	0-150mm	Primary	Moist, brown/yellow brown, clay loam/light clay soil	Metals (Lead)
	BH2A					
	BH3A					
	BH4A					
	BH5A	Outhouse/ Laundry				
	BH6A					
	BH7A	Dwelling No 1				
	BH8A					
	BH9A					
	BH10A					
	BH11A	Garage				OCPs, OPPs, Metals, BTEX, TPHs, PAHs
	BH12A					
	BH13A					
	BH14A					
	BH15A	Dairy Bales				
	BH16A					
	BH17A					
	BH18A					
	BH19A	Shed				
	BH20A					
	BH21A	Meat Safe				
	BH22A					
	BHDUP1	Dwelling No 2		Duplicate QA/QC		Metals (Lead)
	BHTRIP1			Triplicate QA/QC		
	BHDUP1	Dairy Bales		Duplicate QA/QC		OCPs, OPPs, Metals, BTEX, TPHs, PAHs
	BHTRIP1			Triplicate QA/QC		
Round 2	BH23A	Dwelling No 2		Primary		Metals (Lead)
	BH24A					
	BH25A					
	BH26A	Garage				
	BH27A					
	BH28A					
	BH29A	Dwelling No 1				
	BH30A					
	BH31A					
	BH32A					
	BH33A					
	BH34A					

	BH35A					
	BH36A					
	BH37A	Demolished farm storage shed				OCPs, OPPs, Metals, BTEX, TPHs, PAHs
	BH38A					
	BH39A					
	BH40A					
	BH8B	Dwelling No 1	150-300mm			Metals (Lead)
	BH10B					
	BHDUP3	Demolished farm storage shed	0-150mm	Duplicate QA/QC		OCPs, OPPs, Metals, BTEX, TPHs, PAHs
	BHTRIP3			Triplicate QA/QC		

A total of 42 primary surface soil samples (plus 6 x QA/QC) were recovered and placed in laboratory supplied glass jars. The primary samples, together with the QA/QC samples were transported to the HMC office for refrigerated storage prior to delivery to ALS Environmental laboratory for analysis for PCoC.

Refer to **Appendix 13** for the site plan and sampling locations.

10.2 Analytical Testing

Laboratory analytical services were provided by ALS Environmental, Brisbane & Sydney.

10.3 Soil Program

The initial sampling round (Round 1) included targeted sampling around all of the existing structures. Following a review of additional historic aerial photography, a second sampling round (Round 2) was completed, targeting a later identified demolished farm storage shed location, and to delineate identified lead-impacted soil areas.

Round 1:
A total of 22 primary samples were submitted for analysis.
Ten of the samples (surrounding the dwellings) were analyse for the following:

- Metals – lead (Pb)
- Visible ACM

Twelve samples were analysed for the following:

- Organochlorine/organophosphorus pesticides
- Metals - arsenic (As), cadmium (Cd), copper (Cu), chromium (Cr), nickel (Ni), lead (Pb), zinc (Zn), mercury (Hg)
- Petroleum hydrocarbons - Benzene, toluene, ethyl benzene, xylene (BTEX), volatile and semi-volatile Total Recoverable Hydrocarbons (C6-C40), Polyaromatic hydrocarbons (PAH) – identified non-residential structures only.
- Visible ACM

Round 2:
As generally only elevated lead (exceeding investigation criteria) had been identified on the site, in concentrations exceeding background levels, this PCoC was targeted. Further sampling around each of the hotspot locations were undertaken to help delineate the lead-impacted soil. Two samples were also collected at depth (150-300mm) at the two locations with the highest lead concentrations detected in Round 1 to assess the vertical extent of any lead-impacted soil. In total sixteen (16) additional samples were collected and analysed for lead concentrations.

Four locations around the later identified demolished farm storage shed location were also targeted for PCoC associated with the bulk storage of agrichemicals and fuel. The samples were analysed for the following:

- Organochlorine/organophosphorus pesticides

- Metals - arsenic (As), cadmium (Cd), copper (Cu), chromium (Cr), nickel (Ni), lead (Pb), zinc (Zn), mercury (Hg)
- Petroleum hydrocarbons - Benzene, toluene, ethyl benzene, xylene (BTEX), volatile and semi-volatile Total Recoverable Hydrocarbons (C6-C40), Polyaromatic hydrocarbons (PAH)

10.4 Primary and Replicate Results

The laboratory analysis of the selected primary samples is summarised in Tables 11 & 12.

Table 11 – Laboratory Results Summary – Round 1 (5 August 2022)

Parameter	Number of primary samples	LOR (mg/kg)	Criteria Exceedances	Range (mg/kg)	Typical Background (Olszowy et al, 1995) mg/kg
METALS/METALLOIDS					
Arsenic	12	5	0	<5 – 6	5-53
Chromium (VI)	12	2	**1**	20 – **131**	5-56
Copper	12	5	0	9 – 104	3-412
Nickel	12	2	0	8 – 55	5-38
Zinc	12	5	**10**	171 – **4970**	5-92
Cadmium	12	1	0	<1 - 15	nd
Lead	22	5	**6**	27 – **2160**	5-56
Mercury (inorganic)	12	0.1	0	<0.1 – 0.9	nd
ORGANOCHLORINE/ORGANOPHOSPHORUS					
Chlordane	12	0.05	0	<0.05	
Dieldrin + Aldrin	12	0.05	0	<0.05 – 0.17	
DDT+DDD+DDE	12	0.05	0	<0.05 – 0.06	
Heptachlor	12	0.05	0	<0.05	
Chlorpyrifos	12	0.05	0	<0.05	
Endosulfan	12	0.05	0	<0.05	
Endrin	12	0.05	0	<0.05	
BTEX					
Benzene (mg/kg)	12	0.2	0	<0.2	
Toluene (mg/kg)	12	0.5	0	<0.5	
Ethyl Benzene (mg/kg)	12	0.5	0	<0.5	
Total Xylenes	12	0.5	0	<0.5	
TOTAL PETROLEUM HYDROCARBONS					
C6-C10	12	10	0	<10	
>C10-C16	12	50	0	<50	
>C16-C34	12	100	0	<100 – 240	
>C34-C40	12	100	0	<100 – 120	
Total >C10-C40	12	50	0	<50 – 350	
POLYAROMATIC HYDROCARBONS					
Napthalene	12	0.5	0	<0.5	
Benzo-pyrene	12	0.5	**2**	<0.5 – **3.0**	
Total PAH	12	0.5	0	<0.5 – 49.9	

* **Bold** indicates a criteria exceedance

The Round 1 results for organochlorine, organophosphates and BTEX were generally all below the laboratory level of reporting (LOR). Single very low concentrations of dieldrin and DDE were recorded below investigation criteria. Generally, the metals were typical of background concentrations. A single elevated total chromium result was recorded at BH22A (131 mg/kg). The investigation criteria relates to the speciated chromium (VI) concentration and this speciated material would not normally be found associated with this former land use, in aerated surface soil.

Ten elevated zinc results were recorded which exceeded the EIL criteria of 270 mg/kg, ranging from 394 – 4970 mg/kg, however they were all below the HIL A criteria (7400 mg/kg). EIL would not generally be relevant to the proposed future mixed use development, with extensive earthworks proposed and topsoil stripped and stockpiled.

Petroleum hydrocarbon results were generally below the LOR, with several low concentrations of heavier fractions below the investigation criteria. Two samples (BH11A & BH16A) recorded elevated benzo-pyrene concentrations which exceeded the ESL criteria.

Lead results were generally exceeding background levels, and 6 samples exceeded both the total concentration for both the HIL A and two exceeded the EIL criteria. The highest concentration was 2160 mg/kg for BH10A.

Table 12 – Laboratory Results Summary – Round 2 (5 September 2022)

Parameter	Number of primary samples	LOR (mg/kg)	Criteria Exceedances	Range (mg/kg)	Typical Background (Olszowy et al, 1995) mg/kg
METALS/METALLOIDS					
Arsenic	4	5	0	<5	5-53
Chromium	4	2	0	26 – 51	5-56
Copper	4	5	0	13 – 32	3-412
Nickel	4	2	0	11 – 18	5-38
Zinc	4	5	**3**	154 – **630**	5-92
Cadmium	4	1	0	<1 – 3	nd
Lead	20	5	**6**	16 – **1750**	5-56
Mercury (inorganic)	4	0.1	0	<0.1 – 0.3	nd
ORGANOCHLORINE/ORGANOPHOSPHORUS					
Chlordane	4	0.05	0	<0.05	
Dieldrin + Aldrin	4	0.05	0	<0.05	
DDT+DDD+DDE	4	0.05	0	<0.05	
Heptachlor	4	0.05	0	<0.05	
Chlorpyrifos	4	0.05	0	<0.05	
Endosulfan	4	0.05	0	<0.05	
Endrin	4	0.05	0	<0.05	
BTEX					
Benzene (mg/kg)	4	0.2	0	<0.2	
Toluene (mg/kg)	4	0.5	0	<0.5	
Ethyl Benzene (mg/kg)	4	0.5	0	<0.5	
Total Xylenes	4	0.5	0	<0.5	
TOTAL PETROLEUM HYDROCARBONS					
C6-C10	4	10	0	<10	
>C10-C16	4	50	0	<50	
>C16-C34	4	100	0	<100	
>C34-C40	4	100	0	<100	
Total >C10-C40	4	50	0	<50	
POLYAROMATIC HYDROCARBONS					
Napthalene	4	0.5	0	<0.5	
Benzo-pyrene	4	0.5	0	<0.5	
Total PAH	4	0.5	0	<0.5	

* **Bold** indicates a criteria exceedance

The round 2 results recorded six elevated lead results above the HIL A criteria. Three zinc results exceeded the EIL criteria. All organochlorine, organophosphates and petroleum hydrocarbons were below the LOR and, therefore, below the investigation criteria.

10.5 QA/QC Laboratory Data Review

10.5.1 Relative percent difference (RPD)

The Round 1 results show generally correlation between the primary samples (BH3A & BH18A) and the field replicate (BHDUP1 & BHDUP2). The results also show good correlation between the primary samples (BH3A & BH18A) and the triplicates (BHTRIP1 & BHTRIP2) sample.
The Round 2 results show good correlation between the primary sample (BH39A) and the field replication (BHDUP3) and triplicate (BHTRIP3).

10.5.2 Statistical Analysis

Generally, all PCoC results (total concentrations) for the investigation area were below the investigation criteria.

There were two elevated concentrations of benzo-pyrene detected which exceeded the ESL criteria (0.7 mg/kg); however, there is no HSL criteria for this contaminant.

Ten samples detected elevated concentrations of zinc which exceeded the EIL criteria (270 mg/kg); however, they were all still significantly below the HIL A investigation criteria (7400 mg/kg).

Elevated lead concentrations were detected across the site. Twelve (12) of the 42 samples exceeded the HIL A (300 mg/kg) investigation criteria and two samples exceeded the EIL criteria (1100 mg/kg) with the exceedances ranging from 320 – 2160 mg/kg.

The statistical analysis of the arsenic results were calculated against the HIL A criteria using the ProUCL 5.1 software. The results were:

Statistic	**Lead Result**	**Criteria (HIL A)**	**Complies**
95% UCL	614 mg/kg	300 mg/kg	NO
Standard Deviation	502 mg/kg	150 mg/kg	NO
Maximum	2160 mg/kg	750 mg/kg	NO

10.6 Soil Investigation Conclusions

The Soil and Analysis Quality Plan was implemented, and generally all organochlorine and organophosphorus, petroleum hydrocarbons, were below the LOR and, therefore, below the investigation criteria. There were low concentrations in the other metals results detected in the investigation area, however, all results were generally below the investigation criteria, and typical of background concentrations.

Very low concentrations of dieldrin and DDE in a single sample were recorded below investigation criteria.
Generally, the metals were typical of background concentrations. A single elevated total chromium result was recorded at BH22A (131 mg/kg). The investigation criteria relates to the speciated chromium (VI) concentration and this speciated material would not normally be found associated with this former land use, in aerated surface soil.

The lead results returned elevated concentrations in twelve (12) samples which exceeded the investigation criteria. Targeted sampling in Round 2 did not completely delineate the lead-impacted soil in all locations, however this would not be required in this early Planning Proposal stage. Further investigation would be required for any future development application

The rinsate samples (BHRS1 & BHRS2) recorded results all below the LOR and, therefore, were not indicative of cross-contamination.

11 ASBESTOS INVESTIGATION

During the detailed site inspection, potential bonded ACM was identified in the eaves soffit, gable ends and internal linings to the structures, particularly the existing dwellings. Three bulk physical samples (suspected

bonded ACM) were collected from the soil surface and on a concrete slab floor, and sent to ALS Laboratory for identification, two from Dwelling No 2 and one from an outbuilding near Dwelling No 1. All three samples returned a positive identification for asbestos (Chrysotile – White asbestos). Prior to the demolition of these structures, a hazardous waste investigation including intrusive investigation, by suitably qualified and Safework NSW accredited persons would be required. Any identified hazardous material would be removed by a licensed demolition contractor in accordance with Safework NSW regulations prior to further demolition occurring.

12 CONCEPTUAL SITE MODEL

POTENTIAL SOURCE	PATHWAY	EXPOSURE ROUTE	RECEPTOR	PATHWAY COMPLETE
Potential soil contamination from historic hazardous building materials and agrichemical storage/mixing areas associated with existing and demolished structures	Surface water runoff	Chemical/fuel/oil/sediment entering dam/local water ways	Ecological receptors	YES Total lead soil concentrations results exceeded the investigation criteria for the potential residential land use land use. Bonded ACM fragments recorded around buildings
	Exposed surface soil	Dermal contact to exposed soil during earthworks, dwelling occupation, and recreational use	Site worker, Occupier, Visitor	
	Atmospheric dispersion	Inhalation of dust exposed during earthworks and in exposed bare soil areas		
	Home grown produce	Consumption of home grown produce	Occupier/Visitor	
	Leaching to groundwater	Groundwater movement off-site to beneficial users or ecological receptors	Beneficial users/Ecological receptor	

13 CONCLUSIONS AND RECOMMENDATIONS

The Preliminary Site Investigation conclusions are based on the information described in this report and Appendices and should be read in conjunction with the complete report, including Section 14 Limitations.

A Planning Proposal for the rural landholding located at 1055 Bruxner Highway, Goonellabah NSW, is proposed to amend the *Lismore Local Environmental Plan 2012* (LLEP) to enable mixed use development including residential, commercial, industrial and public open space on the land. A Preliminary Site Investigation (PSI), including a desktop assessment of available information, and a detailed site inspection, indicated the property was used as a dairy and for cattle grazing since at least prior to 1942. There are a number of existing structures and a demolished structure location, found on the northern part of the site, however, which given their apparent age, potentially contain historic hazardous building materials. Due to their dilapidated state and weathering, these materials may have caused contamination to the surrounding soils. The non-residential structures may also have been associated with the storage/mixing/spillage of agrichemicals and fuel.

A Soil and Analysis Quality Plan was prepared, and implemented, to assess total soil concentrations of potential contaminants of concern including pesticides, metals and petroleum hydrocarbons, in the immediate surrounds of the structures. Laboratory results recorded generally all organochlorine and organophosphorus chemicals, and petroleum hydrocarbons, below the laboratory level of reporting (LOR) and, therefore, below the investigation criteria. Other metal results were typical of background levels. A single total chromium result, exceeded the speciated chromium (VI) criteria, however, it is unlikely chromium (VI) would be associated with this land use.

Elevated lead results were recorded in a number of locations across the site which exceeded the investigation criteria. Although additional soil investigation delineated some of the locations additional future investigation would be required prior to any remediation associated with a development application.

The identified lead-impacted soil and bonded asbestos containing material is located in surface soil around the existing structures on the northern part of the site, and any future remediation of the small areas of concern would be able to be managed effectively, with remediation options including reinterment on site, or removal off-site to an approved facility.

Based on the information presented, in relation to potential site contamination associated with the current and former land use, the proposed Planning Proposal site, located on Lot 42 DP 868366 & Lot 1 DP 9576771055, 1055 Bruxner Highway, Goonellabah NSW, as shown in Appendix 2 & 3 of this report, is considered suitable for the proposed future mixed use development subject to:

3. Prior to the submission of a development application for development in the area shown as AoC 1 and AoC 2 in this report, a Detailed Site Investigation is to be prepared by a suitably qualified environmental consultant to further delineate the potential contaminants of concern identified in and around the existing dwellings and associated structures.

4. Following the preparation of the Detailed Site Investigation in 1 above, a Remedial Action Plan is to be prepared providing details on required remediation and validation of lead-impacted soil and other identified potential contaminants of concern.

14 LIMITATIONS

Any conclusions presented in this report are relevant to the site condition at the time of inspection and legislation enacted as at date of this report. Actions or changes to the site after time of inspection or in the future will void this report as will changes in relevant legislation.

The findings of this report are based on the objectives and scope of work outlined in Section 1. HMC Environmental has performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties or guarantees expressed or implied, are given. This report does not comment on any regulatory issues arising from the findings, for which a legal opinion should be sought. This report relates only to the objectives and scope of work stated and does not relate to any other works undertaken for the client. The report and conclusions are based on the information obtained at the time of the assessment.

The site history and associated uses, areas of use, and potential contaminants were determined based on the activities described in the scope of work. Additional site information held by the client, regulatory authorities or in the public domain, which was not provided to HMC Environmental or was not sourced by HMC Environmental under the scope of work, may identify additional uses, areas of use and/or potential contaminants. The information sources referenced have been used to determine the site history.

Whilst HMC Environmental has used reasonable care to avoid reliance on data and information that is inaccurate and unsuitable, HMC Environmental is not able to verify the accuracy or completeness of all information and data made available. Further chemicals or categories of chemicals may exist at the sites, which were not identified in the site history, and which may not be expected at the site. The absence of any identified hazardous or toxic materials on the subject land should not be interpreted as a warranty or guarantee that such materials do not exist on the site. If additional certainty is required, additional site history or desktop studies, or environmental sampling and analysis should be commissioned.

The results of this assessment are based upon site inspections and fieldwork conducted by HMC Environmental personnel and information provided by the client. All conclusions regarding the property area are the professional opinions of the HMC Environmental personnel involved with the project, subject to the qualifications made above. HMC Environmental assume no responsibility or liability for errors in any data obtained from regulatory agencies, information from sources outside of HMC Environmental, or developments resulting from situations outside the scope of this project.

15 SIGNATURE

This report has been prepared by Mark Tunks of HMC Environmental Consulting, a suitably qualified environmental consultant, in accordance with the NSW EPA (2020) *Consultants reporting on contaminated land – Contaminated land guidelines.* Note that HMC Environmental Consulting holds current Professional Indemnity Insurance to 4th August 2023.

……

30 September 2022
Completion Date

Mark Tunks
Principal

16 REFERENCES

Australian Standard AS4482.1-2005 Guide to the sampling and investigation of potentially contaminated soil Part 1 - Non volatile and semi volatile compounds*;* and *Australian Standard AS 4482.2-2005* Guide to the sampling and investigation of potentially contaminated soil Part 1 - Volatile and semi volatile compounds.

AS 2005, AS4482.1-2005: Guide to the Investigation and Sampling of Sites with Potentially Contaminated soil - Part 1: Non-volatile and semi-volatile compounds, Standards Australia, Sydney; available at www.standards.org.au

AS 1999, AS4482.2-1999: Guide to the Sampling and Investigation of Potentially Contaminated Soil - Part 2: Volatile substances, Standards Australia, Sydney; available at www.standards.org.au

NSW EPA 1995, *Contaminated Sites: Sampling Design Guidelines,* Environment Protection Authority, Sydney

NSW EPA, 1997, *Contaminated Sites: Guidelines for Assessing Banana Plantation Sites.* Environment Protection Authority, Sydney

NSW EPA 2020 *Consultants reporting on contaminated land – Contaminated land guidelines*

NEPC, 2013. National Environment Protection (Assessment of Site Contamination) Measure 1999 Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater, National Environment Protection Council Service Corporation, as amended 16 May 2013

Olszowy, H., Torr, P., and Imray, P.,(1983) *Trace element concentrations in soils from rural and urban areas of Australia. Contaminated Site Monograph Series 4*. South Australian Health Commission, Adelaide.

17 GLOSSARY

Added contaminant limit (ACL) is the added concentration of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values will be required. ACL values are generated in the process of deriving ecological investigation levels (EILs).

Ambient background concentration (ABC) of a contaminant is the soil concentration in a specified locality that is the sum of the naturally occurring background and the contaminant levels that have been introduced from diffuse or non-point sources by general anthropogenic activity not attributable to industrial, commercial or agricultural activities.

An **area of ecological significance** is one where the planning provisions or land use designation is for the primary intention of conserving and protecting the natural environment. This would include national parks, state parks, and wilderness areas and designated conservation areas.

Bioavailability is a generic term defined as the fraction of a contaminant that is absorbed into the body following dermal contact, ingestion or inhalation.

Bonded asbestos-cement-material (bonded ACM) comprises bonded asbestos containing material which is in sound condition (although possibly broken or fragmented), and is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected as it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and potential for fibre release.

Conceptual site model (CSM) is a description of a site including the environmental setting, geological, hydrogeological and soil characteristics together with the nature and distribution of contaminants. Potentially exposed populations and exposure pathways are identified. Presentation is usually graphical or tabular with accompanying explanatory text.

Contamination means the condition of land or water where any chemical substance or waste has been added as a direct or indirect result of human activity at above background level and represents, or potentially represents, an adverse health or environmental impact.

Ecological investigation levels (EILs) are the concentrations of contaminants above which further appropriate investigation and evaluation will be required. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2 m of soil. EILs may also be referred to as soil quality guidelines in Schedules B5b and B5c.

Health investigation levels (HILs) are the concentrations of a contaminant above which further appropriate investigation and evaluation will be required. HILs are generic to all soil types and generally apply to the top 3 m of soil.

Health risk assessment (HRA) is the process of estimating the potential impact of a chemical, biological or physical agent on a specified human population system under a specific set of conditions.

Investigation levels and **screening levels** are the concentrations of a contaminant above which further appropriate investigation and evaluation will be required. Investigation and screening levels provide the basis of Tier 1 risk assessment.

Multiple-lines-of-evidence approach is the process for evaluating and integrating information from different sources of data and uses best professional judgement to assess the consistency and plausibility of the conclusions which can be drawn.

Risk assessment is the process of estimating the potential impact of a chemical, physical, microbiological or psychosocial hazard on a specified human population or ecological system under a specific set of conditions and for a certain timeframe.

Risk management is a decision-making process involving consideration of political, social, economic and technical factors with relevant risk assessment information relating to a hazard to determine an appropriate course of action.

Screening is the process of comparison of site data to screening criteria to obtain a rapid assessment of contaminants of potential concern.

Tier 1 assessment is a risk-based analysis comparing site data with investigation and screening levels for various land uses to determine the need for further assessment or development of an appropriate management strategy.

18 APPENDICES

Appendix 1 Property Locality

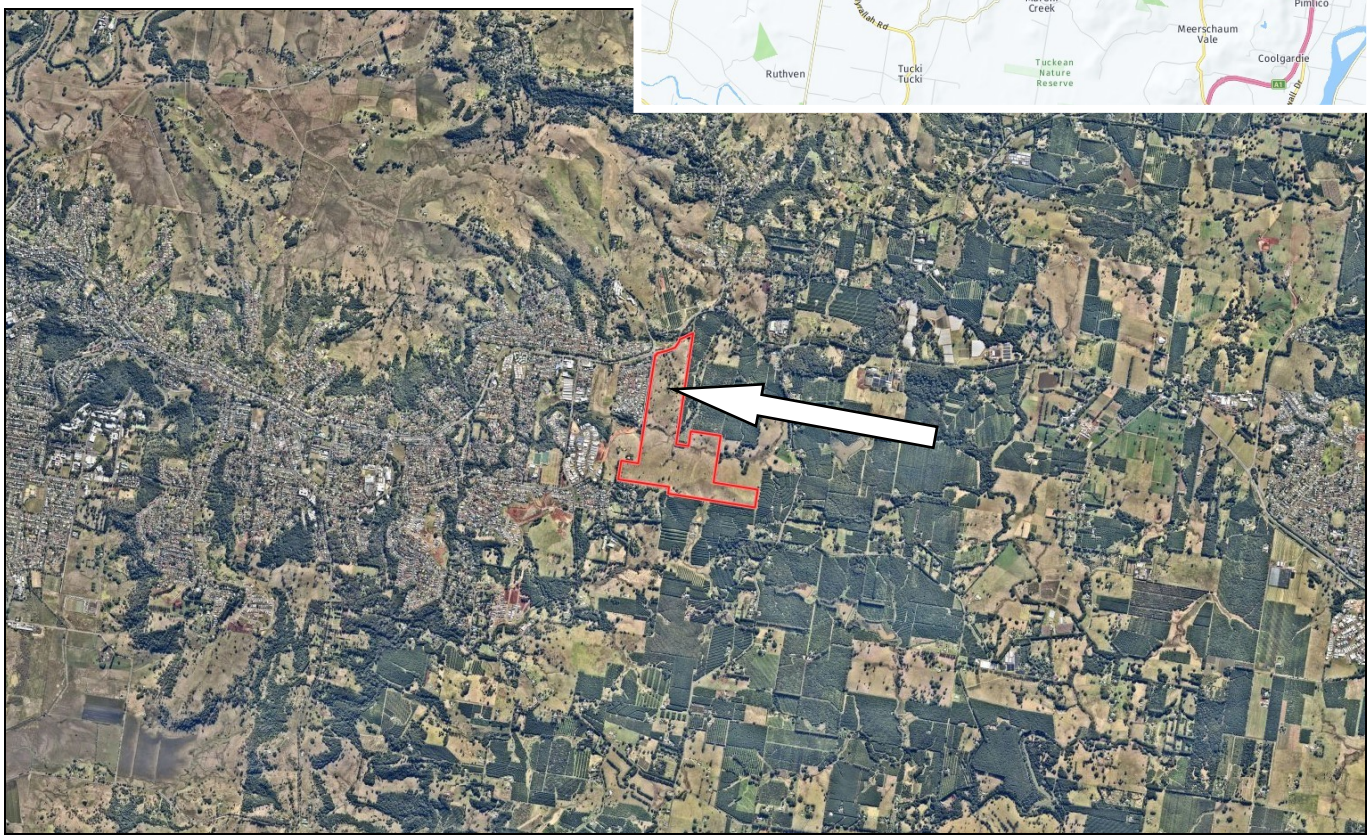


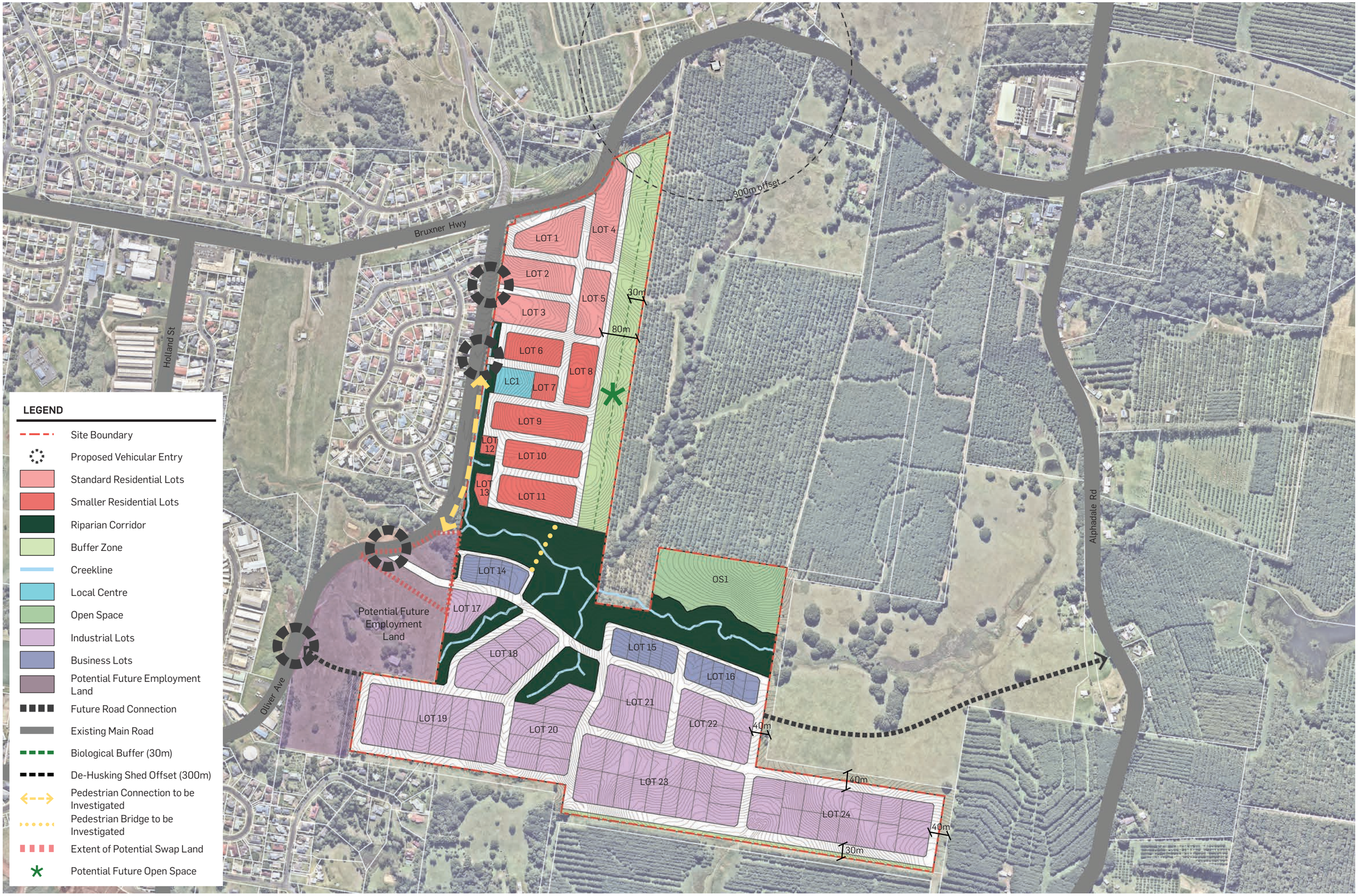
Figure 1 - Surrounding Area - Arrow pointing to investigation area within Goonellabah, NSW (Source: Nearmap 2022)

Appendix 2 Property Boundaries

Figure 2 – Property boundaries for the subject site (Source: Nearmap 2022)

Appendix 3 Illustrative Concept Plan

(SEE FOLLOWING PAGE)



URBIS

OLIVER AVE, LISMORE GOONELLABAH
ILLUSTRATIVE CONCEPT PLAN

DISCLAIMER:

This plan is conceptual and is for discussion purposes only and is subject to further detail study, Council approval, engineering input, and survey. Cadastral boundaries, areas and dimensions are approximate only. Written figured dimensions shall take preference to scaled dimensions.

1:7,500 @ A3

0 100 200 300 400

DATE: 10 AUG 2022

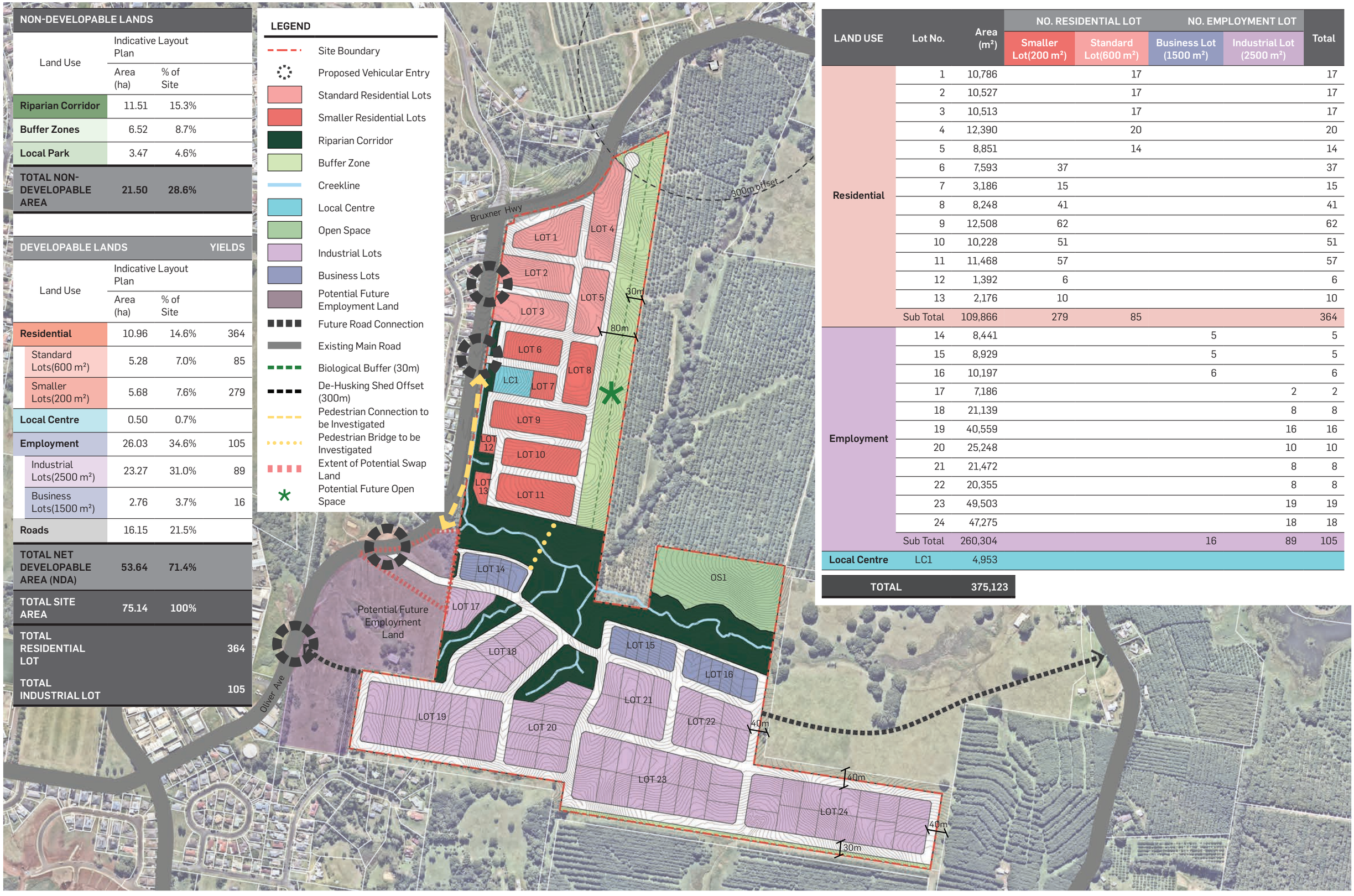
JOB NO: P0040564

NON-DEVELOPABLE LANDS	Indicative Layout Plan	
Land Use	Area (ha)	% of Site
Riparian Corridor	11.51	15.3%
Buffer Zones	6.52	8.7%
Local Park	3.47	4.6%
TOTAL NON-DEVELOPABLE AREA	**21.50**	**28.6%**

DEVELOPABLE LANDS	Indicative Layout Plan		YIELDS
Land Use	Area (ha)	% of Site	
Residential	10.96	14.6%	364
Standard Lots(600 m²)	5.28	7.0%	85
Smaller Lots(200 m²)	5.68	7.6%	279
Local Centre	0.50	0.7%	
Employment	26.03	34.6%	105
Industrial Lots(2500 m²)	23.27	31.0%	89
Business Lots(1500 m²)	2.76	3.7%	16
Roads	16.15	21.5%	
TOTAL NET DEVELOPABLE AREA (NDA)	**53.64**	**71.4%**	
TOTAL SITE AREA	**75.14**	**100%**	
TOTAL RESIDENTIAL LOT			**364**
TOTAL INDUSTRIAL LOT			**105**

LEGEND

- Site Boundary
- Proposed Vehicular Entry
- Standard Residential Lots
- Smaller Residential Lots
- Riparian Corridor
- Buffer Zone
- Creekline
- Local Centre
- Open Space
- Industrial Lots
- Business Lots
- Potential Future Employment Land
- Future Road Connection
- Existing Main Road
- Biological Buffer (30m)
- De-Husking Shed Offset (300m)
- Pedestrian Connection to be Investigated
- Pedestrian Bridge to be Investigated
- Extent of Potential Swap Land
- Potential Future Open Space



LAND USE	Lot No.	Area (m²)	NO. RESIDENTIAL LOT: Smaller Lot(200 m²)	NO. RESIDENTIAL LOT: Standard Lot(600 m²)	NO. EMPLOYMENT LOT: Business Lot (1500 m²)	NO. EMPLOYMENT LOT: Industrial Lot (2500 m²)	Total
Residential	1	10,786		17			17
	2	10,527		17			17
	3	10,513		17			17
	4	12,390		20			20
	5	8,851		14			14
	6	7,593	37				37
	7	3,186	15				15
	8	8,248	41				41
	9	12,508	62				62
	10	10,228	51				51
	11	11,468	57				57
	12	1,392	6				6
	13	2,176	10				10
	Sub Total	109,866	279	85			364
Employment	14	8,441			5		5
	15	8,929			5		5
	16	10,197			6		6
	17	7,186				2	2
	18	21,139				8	8
	19	40,559				16	16
	20	25,248				10	10
	21	21,472				8	8
	22	20,355				8	8
	23	49,503				19	19
	24	47,275				18	18
	Sub Total	260,304			16	89	105
Local Centre	LC1	4,953					
TOTAL		375,123					

OLIVER AVE, LISMORE GOONELLABAH
ILLUSTRATIVE CONCEPT PLAN

DISCLAIMER:

This plan is conceptual and is for discussion purposes only and is subject to further detail study, Council approval, engineering input, and survey. Cadastral boundaries, areas and dimensions are approximate only. Written figured dimensions shall take preference to scaled dimensions.

DATE: 10 AUG 2022
JOB NO: P0040564

1:7,500 @ A3

0 100 200 300 400

Appendix 4 Geology and Soil Landscape

Figure 3 - Geology Map (Source: HMC GIS)

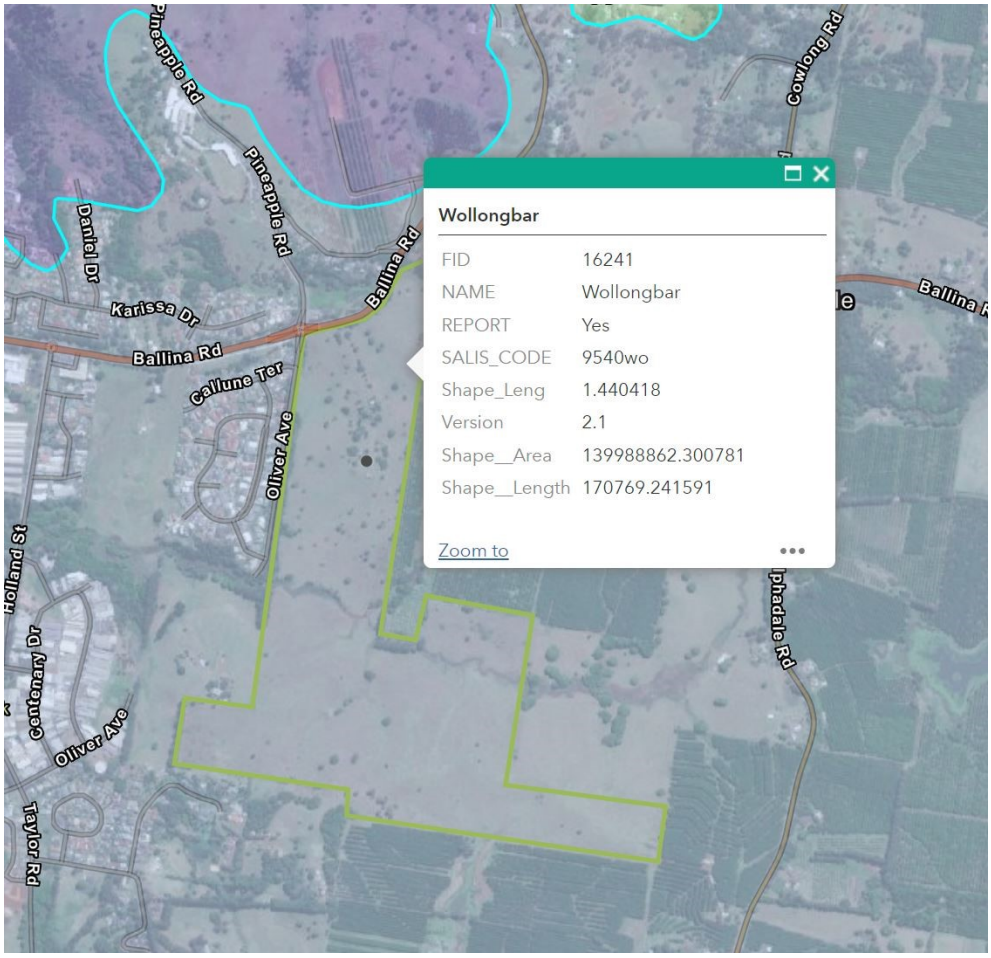


Figure 4 - Soil Landscape (Wollongbar Map (http://www.environment.nsw.gov.au/eSpadeWebApp/)

Appendix 5 Cattle Dip Sites

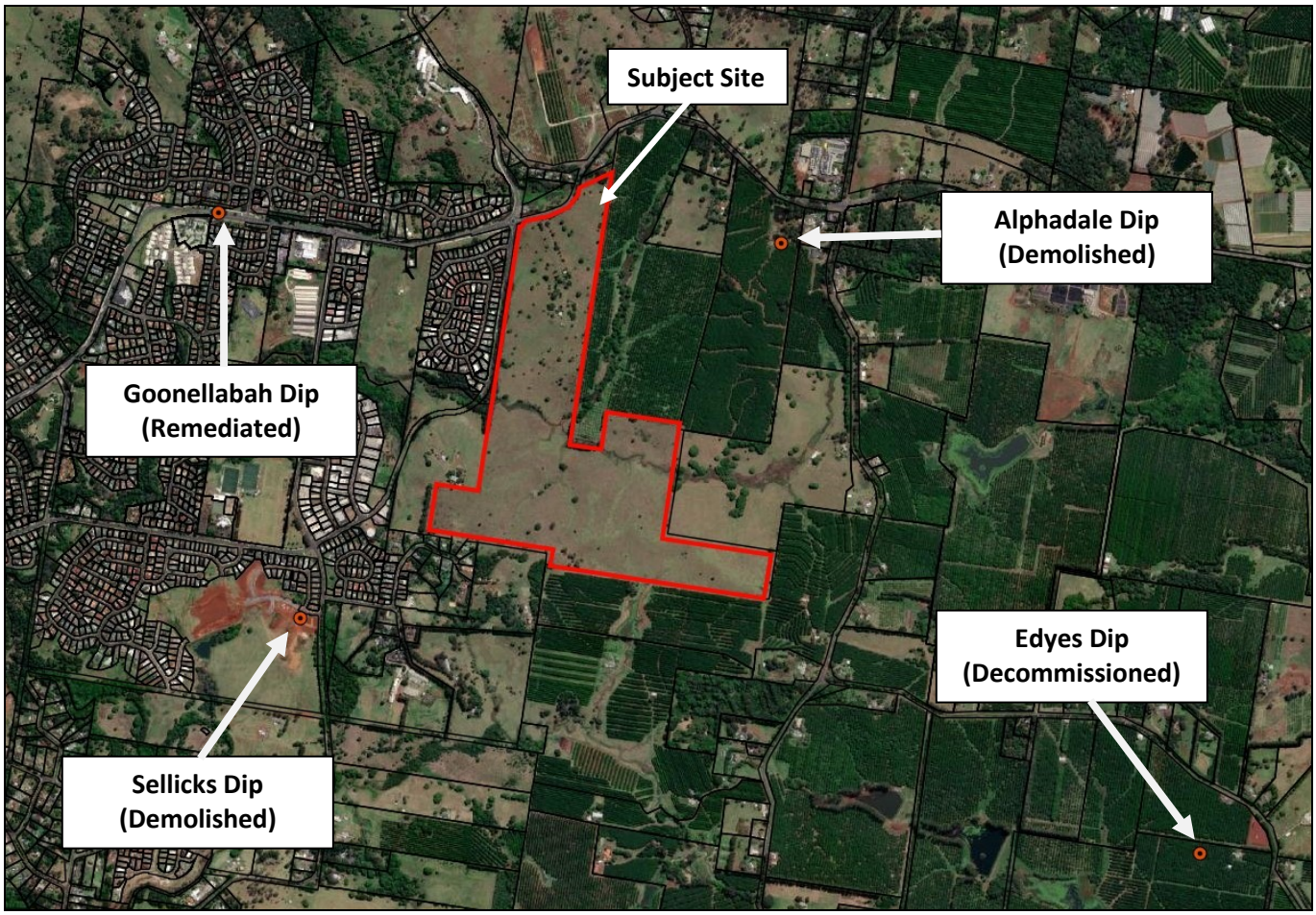


Figure 5 - Cattle Dip Sites (Source: HMC GIS)

Appendix 6 Licensed Groundwater Bores

Figure 6 – Groundwater Bore Locations (Source: http://allwaterdata.water.nsw.gov.au/water.stm)

Appendix 7 Historic Aerial Photography

Figure 7 - Historical Aerial 1958 (NSW Historic imagery viewer)
https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb

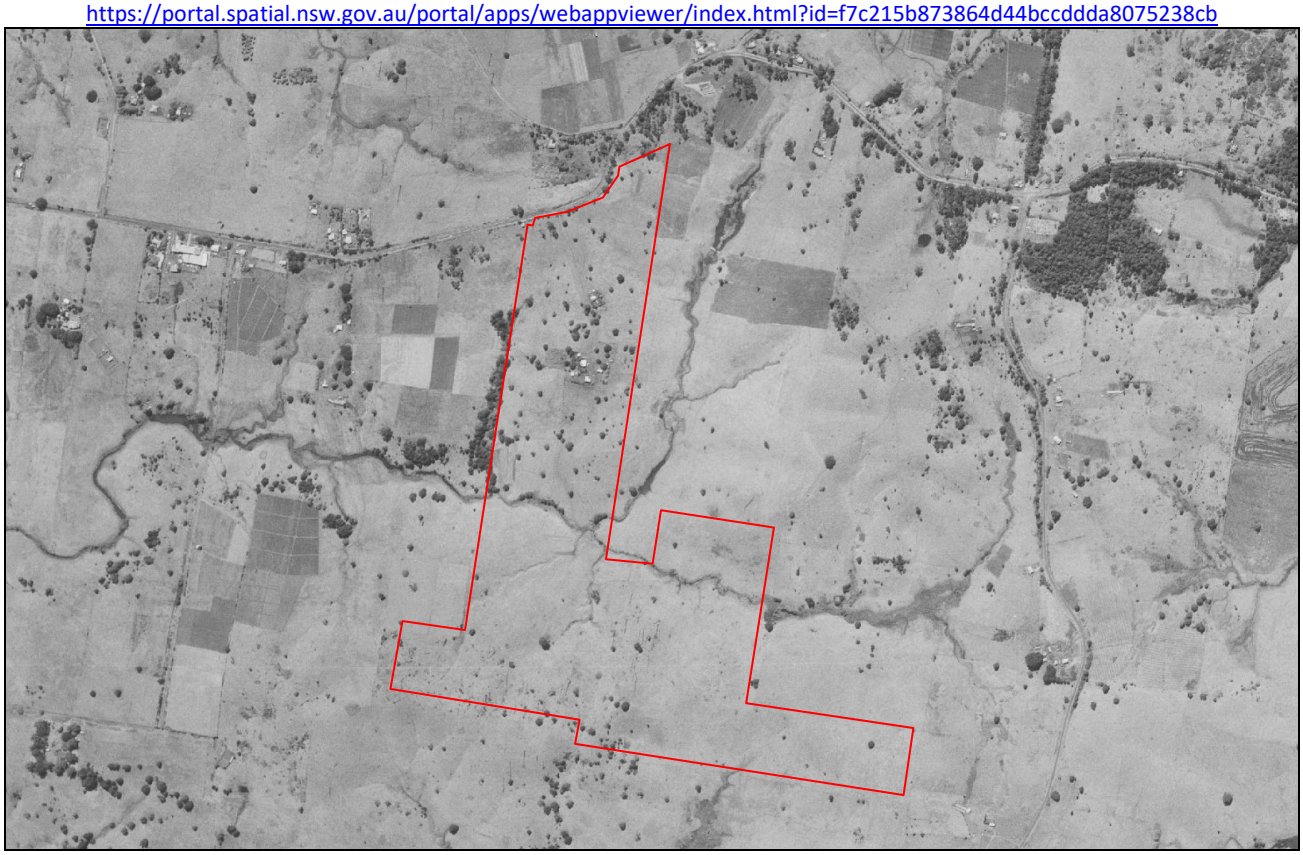


Figure 8 - Historical Aerial 1971 (NSW Historic imagery viewer)
https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb

Figure 9 – Historical Aerial 1979 (NSW Historic imagery viewer)
https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb

Figure 10 – Historical Aerial 1987 (NSW Historic imagery viewer)
https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb

Figure 11 – Historical Aerial 1991 (NSW Historic imagery viewer)
https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb

Figure 12 – Historical Aerial 1997 (NSW Historic imagery viewer)
https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb

Figure 13 - Historical Aerial 2003 (Google Earth)

Figure 14 – Historical Aerial 2004 (Google Earth)

Figure 15 – Current Aerial 2022 (Nearmap)

Appendix 8 Historic Topographical Maps

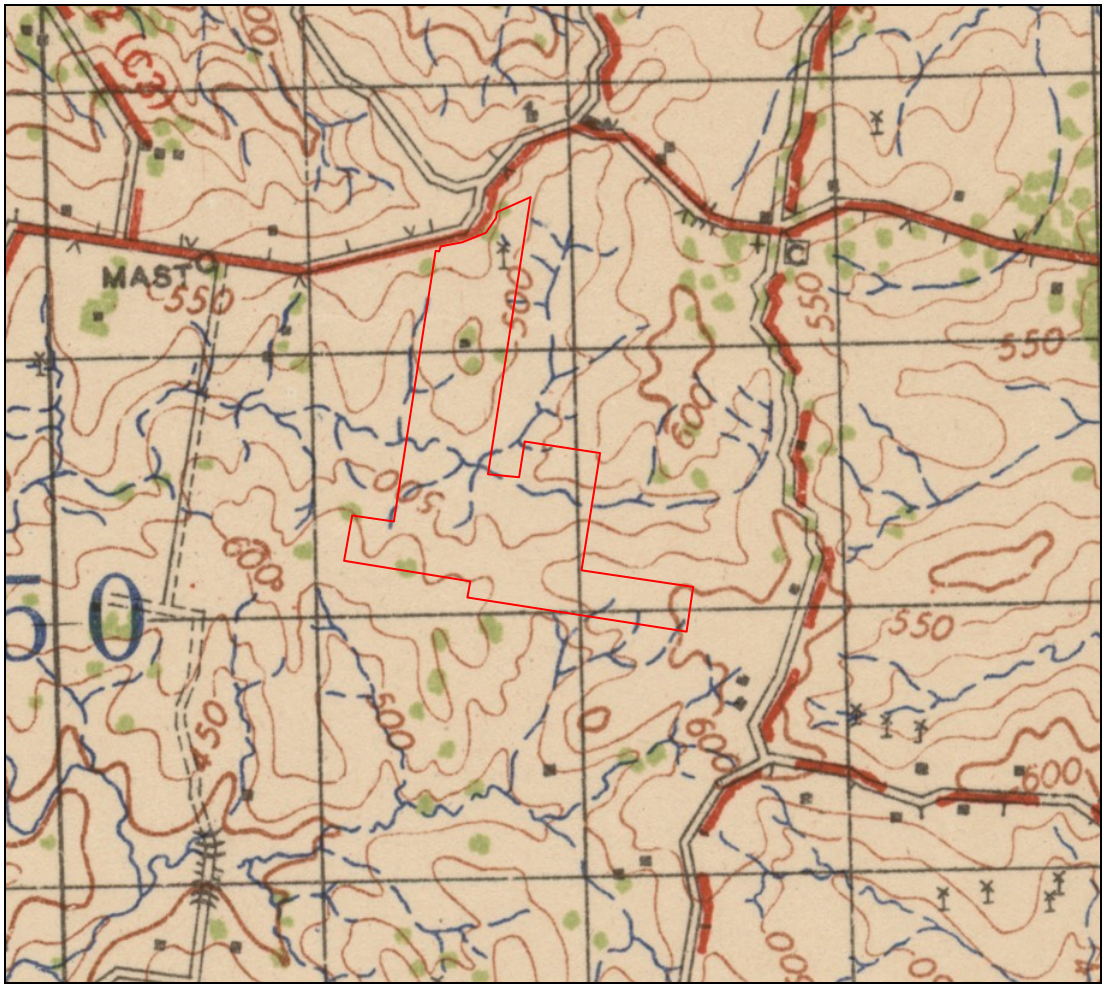


Figure 16 - Topographical Extract (Lismore) 1942

Figure 17 - Topographical Extract (Lismore) 2011

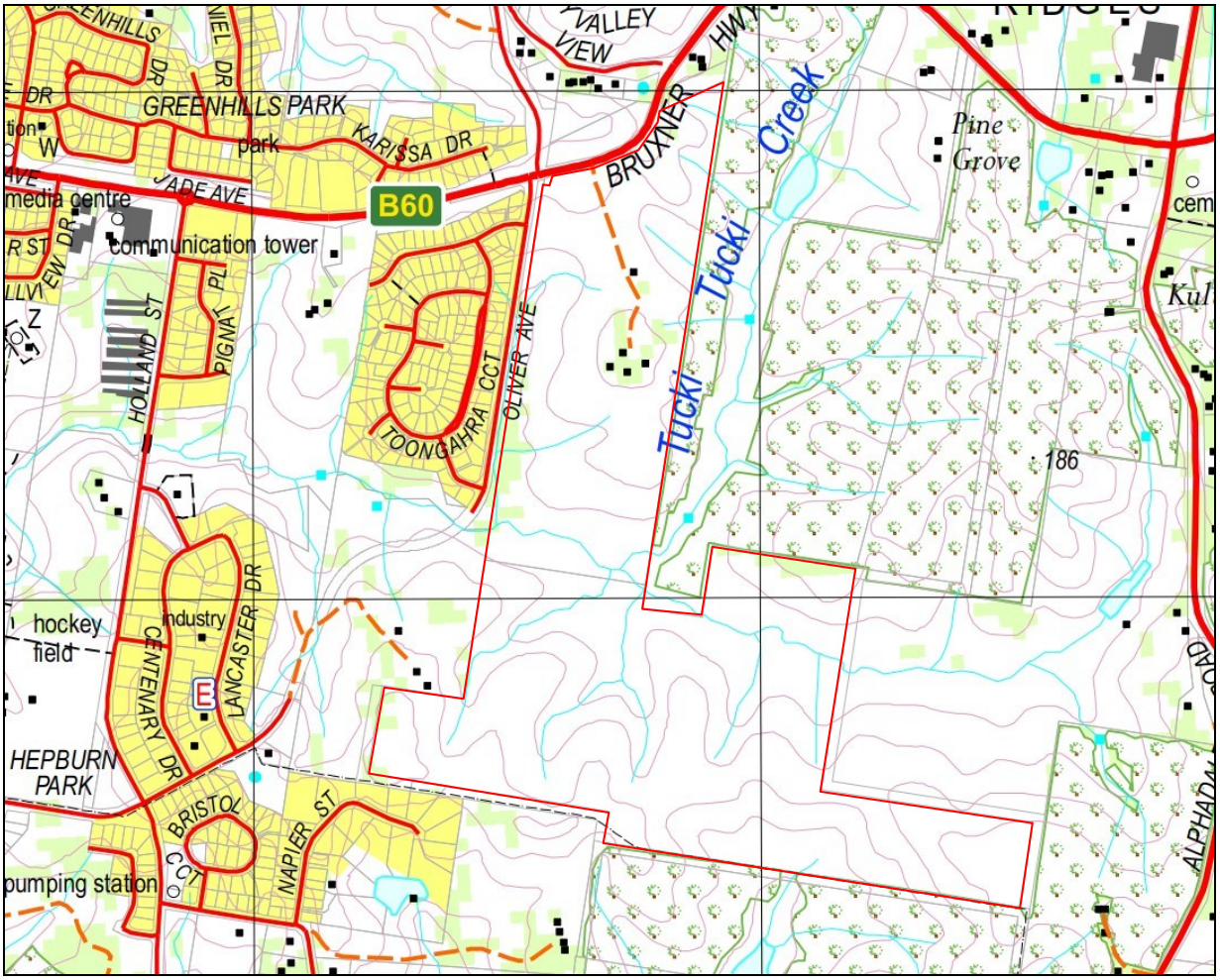


Figure 18 - GeoPDF Topographical Map Extract (Lismore) 2016

Appendix 9 Historic Parish Maps

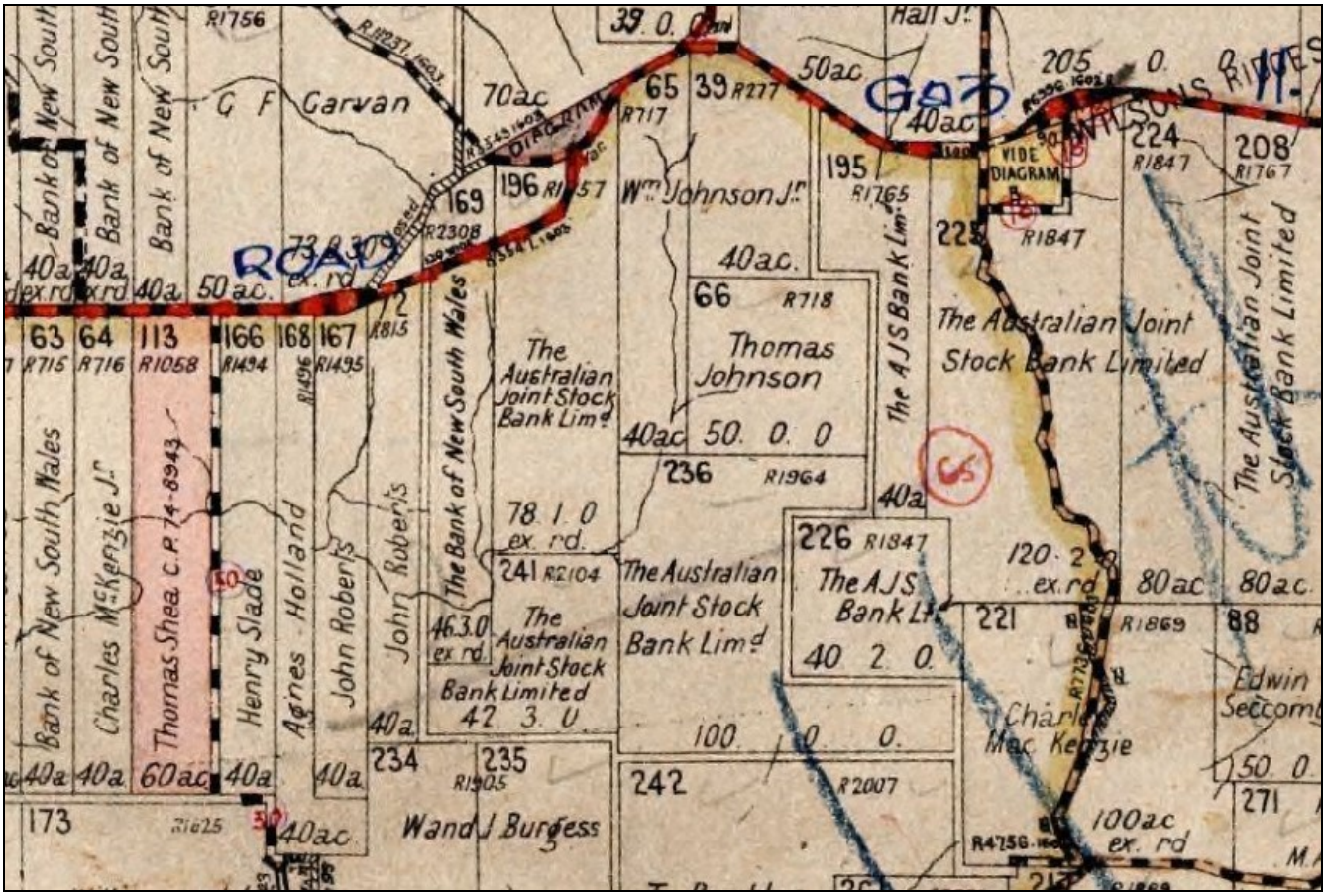


Figure 19 - Parish Map Extract (1914)

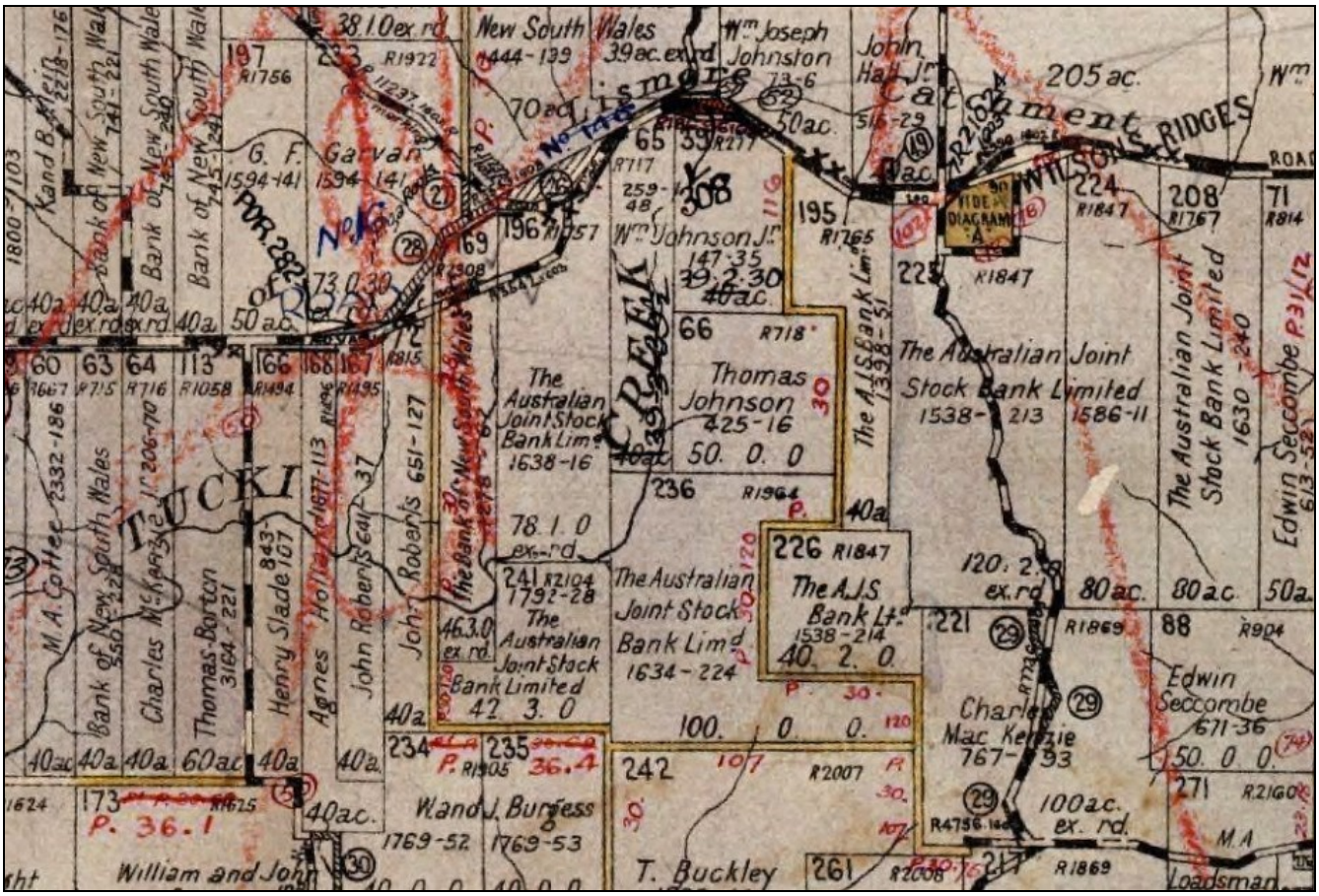


Figure 20 - Parish Map Extract (1926)

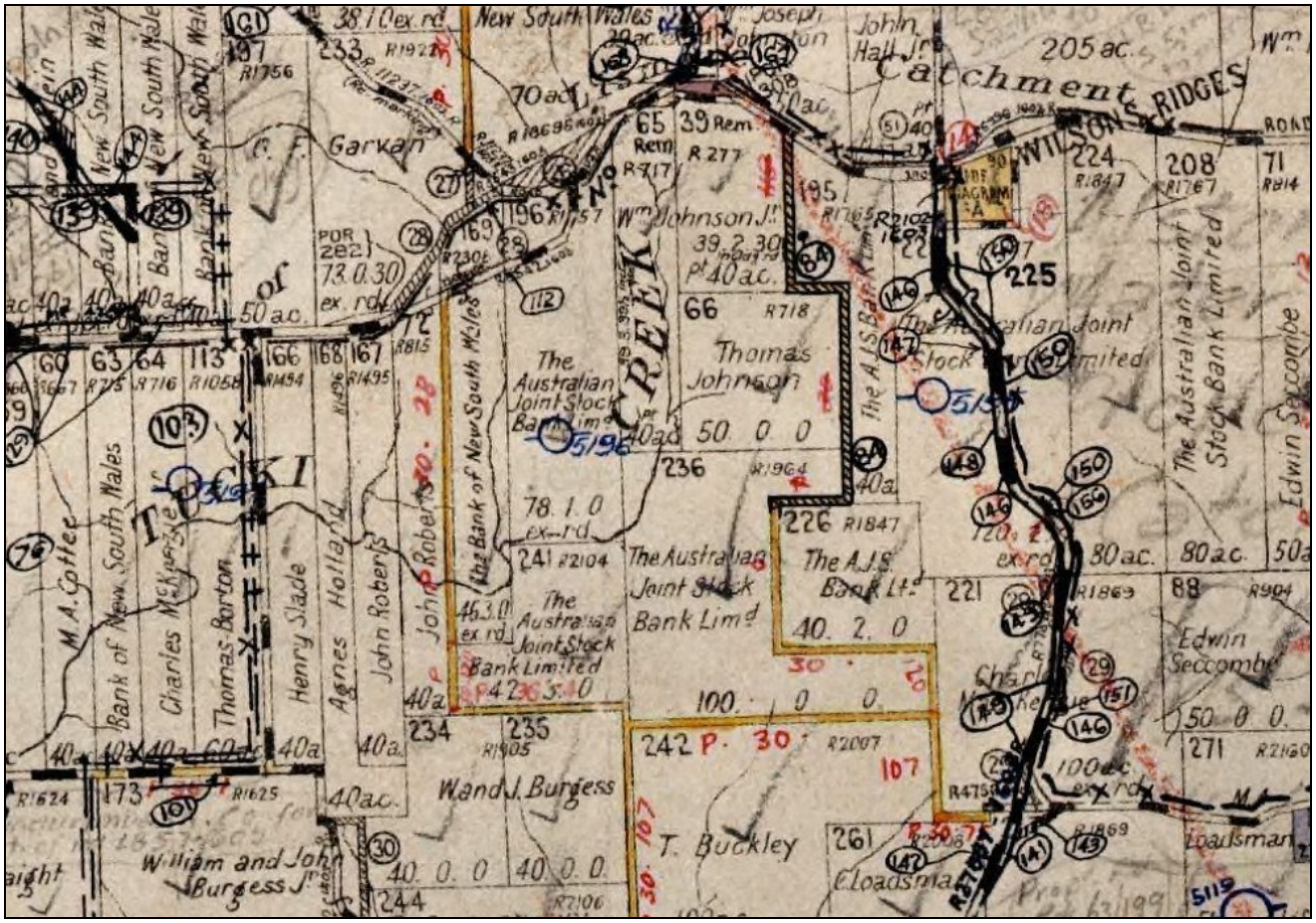


Figure 21 - Parish Map Extract (1940)

Appendix 10 Current LLEP 2014 Zone Map

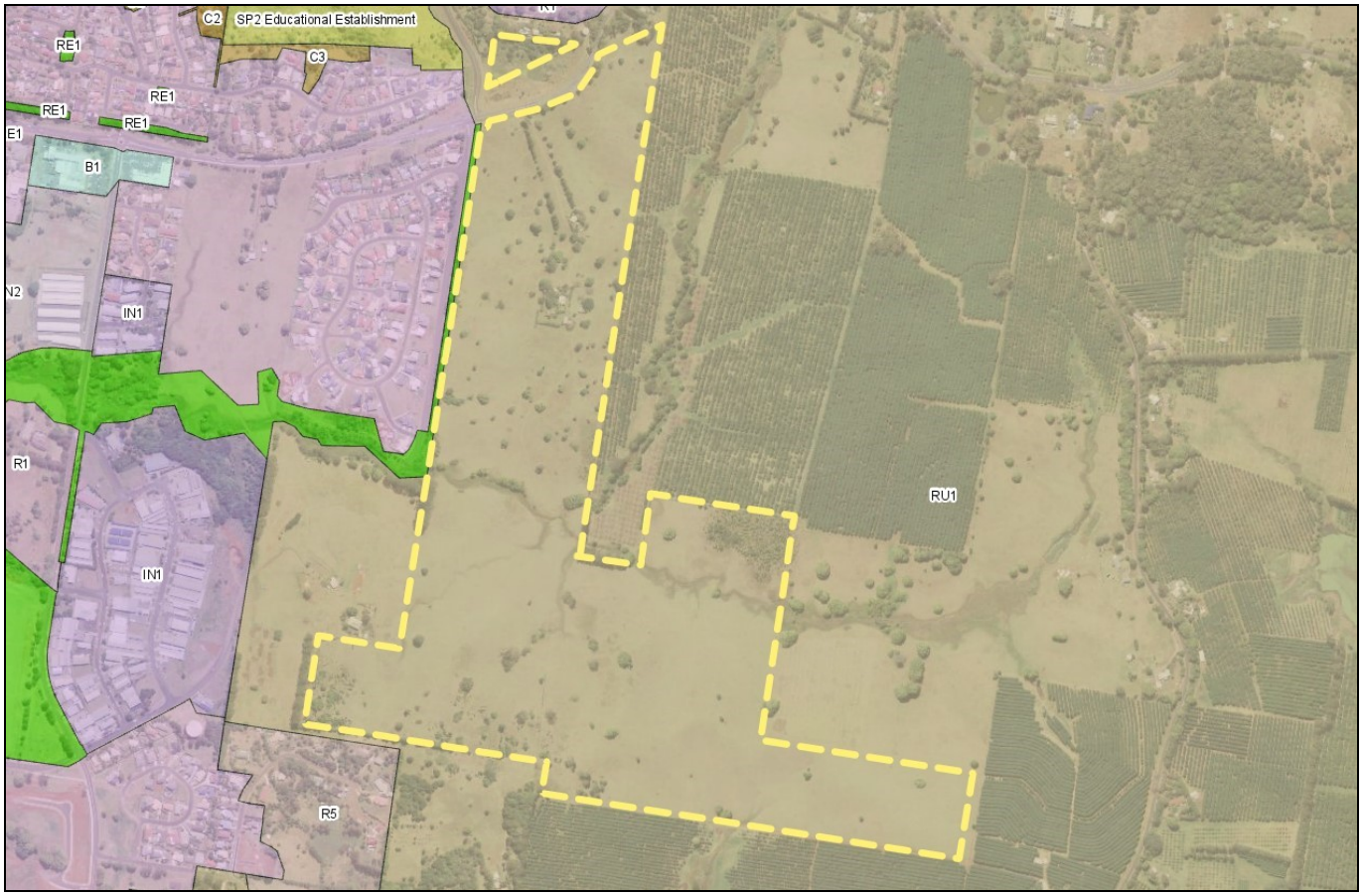


Figure 22 – NSW Legislation Zone Plan

(Source: https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address)

Appendix 11 Photographic Log

Photo No. 1	**Date** 05/08/2022
Description: View S overlooking the existing Dwelling No 1 (southern dwelling)	

Photo No. 2	**Date** 05/08/2022
Description: View S overlooking the existing garage adjacent to Dwelling No 1	

Photo No. 3	**Date** 05/08/2022
Description: View S overlooking the existing diary bales to the southeast of Dwelling No 1.	

Photo No. 4	**Date** 05/08/2022
Description: View NE overlooking the dilapidated shed to the west of Dwelling No1.	

Photo No. 5	**Date** 05/08/2022
Description: View NE overlooking the former meat safe to the west of Dwelling No 1.	

Photo No. 6	**Date** 05/09/2022
Description: View NE overlooking a stockpile of building material on the site of the previously demolished storeshed, to the southwest of Dwelling No1.	

Photo No. 7	**Date** 05/08/2022
Description: View SE overlooking the existing Dwelling No 2 (northern dwelling).	

Photo No. 8	**Date** 05/08/2022
Description: View NW overlooking the detached outhouse/laundry behind Dwelling No 2.	

Photo No. 9	**Date** 05/09/2022
Description: Drone photo overlooking Dwelling No 1 and the surrounding structures.	

Photo No. 10	**Date** 05/09/2022
Description: Drone photo – View to the north towards the Bruxner Highway, with the structures and vehicle access visible.	

Photo No. 11	**Date** 05/09/2022
Description: Drone Photo – View to the south overlooking the undulating property which is currently used for cattle grazing. The Tucki Tucki Creek is visible transecting the property.	

Appendix 12 Site Plan – Investigation Area – Areas of concern

(Next Page)

PRELIMINARY SITE INVESTIGATION SAMPLING LOCATIONS

Areas of concern

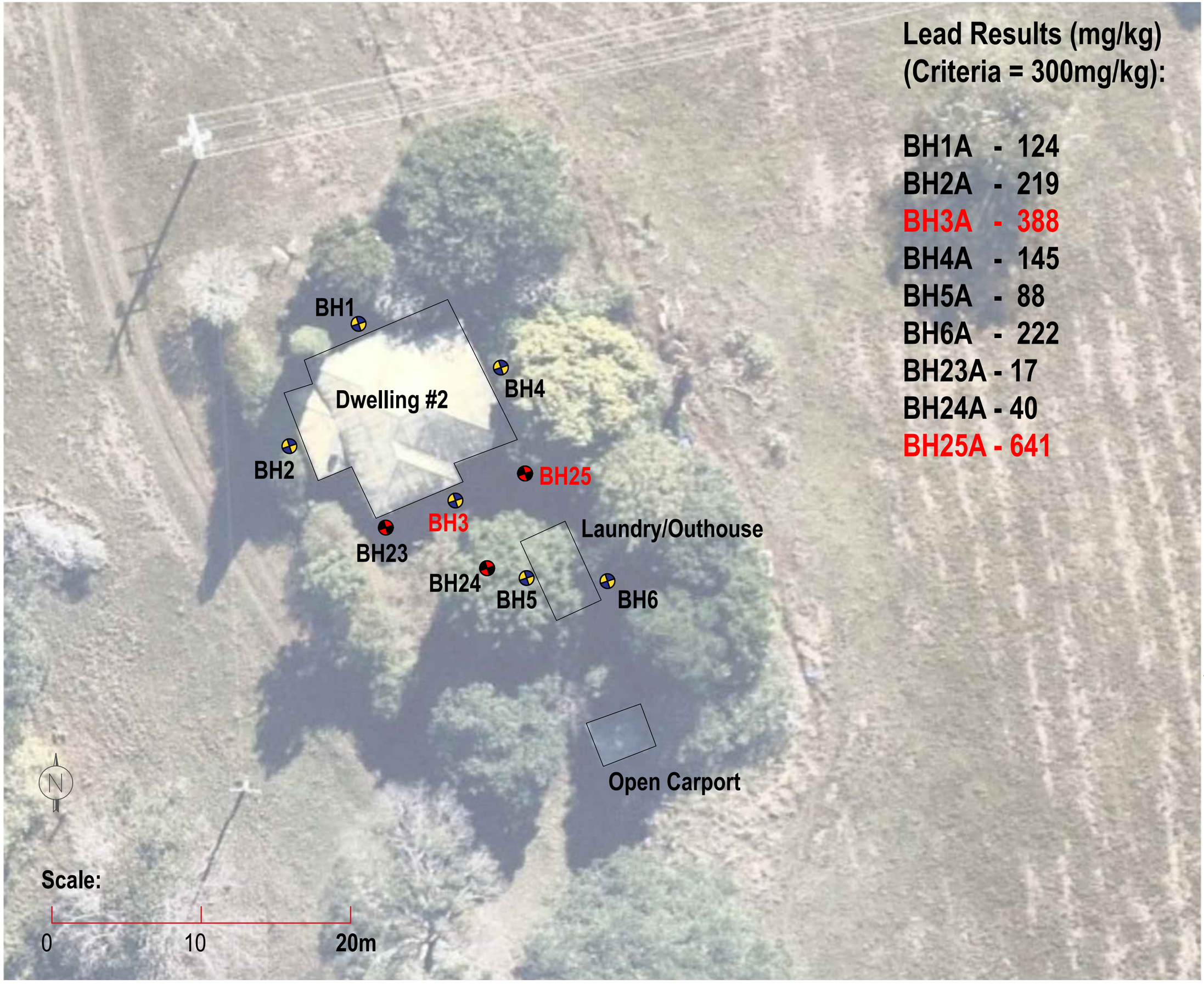
Job: HMC2022.1106
DWG: HMCDWG2022.1106
Date: September 2022
Revised: 30/09/2022
Drawn: MF

Lot 42 DP 868366
1055 Bruxner Highway
Goonellabah NSW

HMC Environmental Consulting Pty Ltd
Tweed Heads NSW
0755368863
www.hmcenvironment.com.au
admin@hmcenvironment.com.au

Appendix 13 Sampling Locations

(Next Page)



Lead Results (mg/kg) (Criteria = 300mg/kg):

BH1A - 124
BH2A - 219
BH3A - 388
BH4A - 145
BH5A - 88
BH6A - 222
BH23A - 17
BH24A - 40
BH25A - 641

PRELIMINARY SITE INVESTIGATION SAMPLING LOCATIONS

Area of concern # 2

HMC Sampling Locations 05_08_2022

HMC Sampling Locations 05_09_2022

Job: HMC2022.1106
DWG: HMCDWG2022.1106
Date: September 2022
Revised: 30/09/2022
Drawn: MF

Lot 42 DP 868366
1055 Bruxner Highway
Goonellabah NSW

HMC Environmental Consulting Pty Ltd
Tweed Heads NSW
0755368863
www.hmcenvironment.com.au
admin@hmcenvironment.com.au

Appendix 14 Laboratory Results Summary & RPD

Table 13 - Laboratory Results – Round 1 (05.08.2022)

Sample ID:	BH1A	BH2A	BH3A	BH4A	BH5A	BH6A	BH7A	BH8A	BH9A	BH10A	BHDUP1	BHTRIP1
Metals/Metalloids (mg/kg)												
Lead	124	219	**388**	145	88	222	**626**	**1640**	**320**	**2160**	**337**	**353**
Sample ID:	**BH11A**	**BH12A**	**BH13A**	**BH14A**	**BH15A**	**BH16A**	**BH17A**	**BH18A**	**BH19A**	**BH20A**	**BH21A**	**BH22A**
Metals/Metalloids (mg/kg)												
Arsenic	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	<5	6
Chromium (total)	38	40	37	47	34	40	34	39	43	20	43	**131**
Copper	52	19	24	17	24	17	11	9	20	49	18	104
Nickel	13	13	10	13	15	10	8	9	12	12	13	55
Zinc	**1380**	**1200**	**394**	**2620**	**4880**	171	**562**	213	**493**	**2750**	**2130**	**4970**
Cadmium	<1	<1	<1	<1	15	<1	<1	<1	<1	5	4	5
Lead	**733**	62	45	82	131	74	85	27	46	143	127	203
Mercury (inorganic)	0.3	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.9
Organochlorine/Organophosphorus (mg/kg)												
Chlordane	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin + Aldrin	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DDT+DDD+DDE	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06
Heptachlor	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BTEX (mg/kg)												
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Petroleum Hydrocarbons (mg/kg)												
Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo-pyrene	0.8	<0.5	<0.5	<0.5	<0.5	3.0	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Total PAH	7.2	<0.5	<0.5	<0.5	<0.5	49.9	<0.5	<0.5	<0.5	<0.5	<0.5	5.3
Polyaromatic Hydrocarbons (mg/kg)												
C6-C10 (F1)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C10-16 (F2)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16-C34	200	<100	<100	<100	<100	170	<100	<100	<100	<100	<100	240
>C34-C40	120	<100	<100	<100	<100	120	<100	<100	<100	<100	<100	110

Total >C10-C40	320	<50	<50	<50	<50	290	<50	<50	<50	<50	<50	350	
Sample ID:	**BHDUP2**	**BHTRIP2**											
Metals/Metalloids (mg/kg)													
Arsenic	<5	<5											
Chromium (total)	38	52											
Copper	12	14											
Nickel	9	18											
Zinc	**374**	270											
Cadmium	<1	<1											
Lead	50	33											
Mercury (inorganic)	<0.1	<0.1											
Organochlorine/Organophosphorus (mg/kg)													
Chlordane	<0.05	<0.05											
Dieldrin + Aldrin	<0.05	<0.05											
DDT+DDD+DDE	<0.05	<0.05											
Heptachlor	<0.05	<0.05											
Chlorpyrifos	<0.05	<0.05											
Endosulfan	<0.05	<0.05											
Endrin	<0.05	<0.05											
BTEX (mg/kg)													
Benzene	<0.2	<0.2											
Toluene	<0.5	<0.5											
Ethylbenzene	<0.5	<0.5											
Total Xylenes	<0.5	<0.5											
Total Petroleum Hydrocarbons (mg/kg)													
Naphthalene	<0.5	<0.5											
Benzo-pyrene	<0.5	<0.5											
Total PAH	<0.5	<0.5											
Polyaromatic Hydrocarbons (mg/kg)													
C6-C10 (F1)	<10	<10											
>C10-16 (F2)	<50	<50											
>C16-C34	<100	<100											
>C34-C40	<100	<100											
Total >C10-C40	<50	<50											

Table 14 - Laboratory Results – Round 2 (05.09.2022)

Sample ID:	BH8B	BH10B	BH23A	BH24A	BH25A	BH26A	BH27A	BH28A	BH29A	BH30A	BH31A	BH32A
Metals/Metalloids (mg/kg)												
Lead	146	**783**	17	40	**641**	69	46	84	224	177	**885**	35
Sample ID:	**BH33A**	**BH34A**	**BH35A**	**BH36A**	**BH37A**	**BH38A**	**BH39A**	**BH40A**	**BHDUP3**	**BHTRIP3**		
Metals/Metalloids (mg/kg)												
Arsenic					<5	<5	<5	<5	<5	<5		
Chromium (total)					39	43	26	51	24	43		
Copper					32	22	21	13	30	30		
Nickel					12	11	18	13	23	24		
Zinc					**630**	**446**	154	**562**	133	192		
Cadmium					3	<1	<1	1	<1	<1		
Lead	**1120**	**720**	**1750**	176	162	106	16	34	24	36		
Mercury (inorganic)					0.3	<0.1	<0.1	<0.1	<0.1	<0.1		
Organochlorine/Organophosphorus (mg/kg)												
Chlordane					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Dieldrin + Aldrin					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
DDT+DDD+DDE					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Heptachlor					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Chlorpyrifos					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Endosulfan					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Endrin					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
BTEX (mg/kg)												
Benzene					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
Toluene					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Ethylbenzene					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total Xylenes					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total Petroleum Hydrocarbons (mg/kg)												
Naphthalene					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Benzo-pyrene					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total PAH					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Polyaromatic Hydrocarbons (mg/kg)												
C6-C10 (F1)					<10	<10	<10	<10	<10	<10		
>C10-16 (F2)					<50	<50	<50	<50	<50	<50		
>C16-C34					<100	<100	<100	<100	<100	<100		
>C34-C40					<100	<100	<100	<100	<100	<100		
Total >C10-C40					<50	<50	<50	<50	<50	<50		

Table 15 - Relative Percentage Difference (RPD%)

	BH3A	BHDUP1	Mean	RPD%	BH3A	BHTRIP1	Mean	RPD%
Metals/Metalloids (mg/kg)								
Lead	388	337	362.5	14.1	388	353	345	4.6
	BH18A	**BHDUP2**	**Mean**	**RPD%**	**BH18A**	**BHTRIP2**	**Mean**	**RPD%**
Metals/Metalloids (mg/kg)								
Arsenic	<5	<5	<5	-	<5	<5	<5	-
Chromium (total)	39	38	38.5	2.6	39	52	45.5	28.6
Copper	9	12	10.5	28.6	9	14	11.5	43.5
Nickel	9	9	9	-	9	18	13.5	66.7
Zinc	213	374	293.5	**54.9**	213	270	241.5	23.6
Cadmium	<1	<1	<1	-	<1	<1	<1	-
Lead	27	50	38.5	59.7	27	33	30	20
Mercury (inorganic)	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
	BH39A	**BHDUP3**	**Mean**	**RPD%**	**BH39A**	**BHTRIP3**	**Mean**	**RPD%**
Metals/Metalloids (mg/kg)								
Arsenic	<5	<5	<5	-	<5	<5	<5	-
Chromium (total)	26	24	25	8	26	43	34.5	49.3
Copper	21	30	25.5	35.3	21	30	25.5	35.3
Nickel	18	23	20.5	24.9	18	24	21	28.6
Zinc	154	133	143.5	14.6	154	192	173	22
Cadmium	<1	<1	<1	-	<1	<1	<1	-
Lead	16	24	20	40	16	36	26	76.9
Mercury (inorganic)	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-

Appendix 15 Asbestos Investigation – Chain of Custody and Laboratory Certificates

SEE FOLLOWING PAGES

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 3/1 Burma Road Pooraka SA 5095 Ph: 08 8162 5130 E: adelaide@alsglobal.com

☐BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com

☐MACKAY Unit 2/20 Caterpillar Drive Paget QLD 4740 Ph: 07 4952 5795 E: ALSEnviro.Mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph. 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: ALSEnviro.Townsville@alsglobal.com

☐WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: HMC Environmental Consulting Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☑ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Tweed Heads		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
PROJECT: Bruxner Highway GOONELLABAH **PROJECT NO.:** 2022.1106	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: HMC2022.1106	**COUNTRY OF ORIGIN:**	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: MARK TUNKS	**CONTACT PH:** 0755 368863	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Mark Tunks HMC	**SAMPLER MOBILE:** 0408 279212		
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**		
Email Reports to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au			
Email Invoice to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au			

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
DATE/TIME: 9/8/2022	DATE/TIME: 11/08/2022 11:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: DOUBLE BAGGED BONDED ASBESTOS (FIBRO) SUSPECTED

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EA200B - ASBESTOS								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	DWELLING 1 NE	5/08/2022 0:00	S	B	1	X								POTENTIAL ASBESTOS
2	DWELLING 1 NW	5/08/2022 0:00	S	B	1	X								POTENTIAL ASBESTOS
3	CHEM STORE	5/08/2022 0:00	S	B	1	X								POTENTIAL ASBESTOS
				TOTAL	3	3								

Environmental Division
Brisbane
Work Order Reference
EB2223514

Telephone : +61-7-3243 7222

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 Speciation 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2223514**	Page	: 1 of 3
Client	: **HMC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MARK TUNKS	Contact	: Customer Services EB
Address	: PO BOX 311 TWEED HEADS NSW 2485	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 5536 8863	Telephone	: +61-7-3243 7222
Project	: 2022.1106 Bruxner Highway GOONELLABAH	Date Samples Received	: 11-Aug-2022 11:00
Order number	: HMC2022.1106	Date Analysis Commenced	: 16-Aug-2022
C-O-C number	: ----	Issue Date	: 18-Aug-2022 09:14
Sampler	: MARK TUNKS		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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*
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, 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.

- Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no 1656.
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- **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: N/A - Not Applicable

Analytical Results

Sub-Matrix: **SOLID** (Matrix: **SOLID**)			Sample ID	**DWELLING 1 NE**	**DWELLING 1 NW**	**CHEM STORE**	**----**	**----**
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EB2223514-001**	**EB2223514-002**	**EB2223514-003**	**--------**	**--------**
				Result	Result	Result	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	**Yes**	**Yes**	**Yes**	**----**	**----**
Asbestos Type	1332-21-4	-	--	**Ch**	**Ch**	**Ch**	**----**	**----**
Asbestos (Trace)	1332-21-4	5	Fibres	**N/A**	**N/A**	**N/A**	**----**	**----**
Sample weight (dry)	----	0.01	g	**107**	**79.2**	**38.6**	**----**	**----**
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	**No**	**No**	**----**	**----**
Organic Fibre	----	0.1	g/kg	**No**	**No**	**Yes**	**----**	**----**
APPROVED IDENTIFIER:	----	-	--	**B.SCHRADER**	**B.SCHRADER**	**B.SCHRADER**	**----**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOLID**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	DWELLING 1 NE - 05-Aug-2022 00:00	One piece of asbestos cement sheeting approximately 135x105x5mm.
EA200: Description	DWELLING 1 NW - 05-Aug-2022 00:00	One piece of asbestos cement sheeting approximately 95x75x5mm.
EA200: Description	CHEM STORE - 05-Aug-2022 00:00	One piece of asbestos cement sheeting approximately 105x75x5mm.

Inter-Laboratory Testing

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

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

Appendix 16 Round 1 – Chain of Custody and Laboratory Certificates

SEE FOLLOWING PAGES

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 3/1 Burma Road Pooraka SA 5095 Ph: 08 8162 5130 E: adelaide@alsglobal.com

☐BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 48 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com

☐MACKAY Unit 2/20 Caterpillar Drive Paget QLD 4740 Ph: 07 4952 5795 E: ALSEnviro.Mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: ALSEnviro.Townsville@alsglobal.com

☐WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: HMC Environmental Consulting Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Tweed Heads		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Bruxner Highway GOONELLABAH **PROJECT NO.:** 2022.1106	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: HMC2022.1106	**COUNTRY OF ORIGIN:**	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: MARK TUNKS	**CONTACT PH:** 0755 368863	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Mark Tunks HMC	**SAMPLER MOBILE:** 0408 279212	**RELINQUISHED BY:**	**RECEIVED BY:**
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**		DATE/TIME: 9/8/22 1:55
Email Reports to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au		DATE/TIME:	**RELINQUISHED BY:** / DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au			**RECEIVED BY:** / DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EG020F (LEAD)	EA200G (ASBESTOS)	S-12 (OC/OP)	S-2 (METALS)	S-7 - TRH/BTEXN/PAH				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH1A	5/08/2022 0:00	S	ST	1	X	X							
2	BH2A	5/08/2022 0:00	S	ST	1	X	X							
3	BH3A	5/08/2022 0:00	S	ST	1	X	X							
4	BH4A	5/08/2022 0:00	S	ST	1	X	X							
5	BH5A	5/08/2022 0:00	S	ST	1	X	X							
6	BH6A	5/08/2022 0:00	S	ST	1	X	X							
7	BH7A	5/08/2022 0:00	S	ST	1	X	X							
8	BH8A	5/08/2022 0:00	S	ST	1	X	X							
9	BH9A	5/08/2022 0:00	S	ST	1	X	X							
10	BH10A	5/08/2022 0:00	S	ST	1	X	X							
11	BH11A	5/08/2022 0:00	S	ST	1			X	X	X				
12	BH12A	5/08/2022 0:00	S	ST	1			X	X	X				
13	BH13A	5/08/2022 0:00	S	ST	1			X	X	X				
14	BH14A	5/08/2022 0:00	S	ST	1			X	X	X				
				TOTAL	14	10	10	4	4	4				

Environmental Division Brisbane
Work Order Reference
EB2223282

Telephone : +61-7-3243 7222

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 Speciation 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 3/1 Burma Road Pooraka SA 5095 Ph: 08 8162 5130 E: adelaide@alsglobal.com

☐BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 48 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com

☐MACKAY Unit 2/20 Caterpillar Drive Paget QLD 4740 Ph: 07 4952 6795 E: ALSEnviro.Mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: ALSEnviro.Townsville@alsglobal.com

☐WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: HMC Environmental Consulting Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Tweed Heads		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Bruxner Highway GOONELLABAH **PROJECT NO.: 2022.1106**	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: HMC2022.1106	**COUNTRY OF ORIGIN:**	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: MARK TUNKS	**CONTACT PH: 0755 368863**	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Mark Tunks HMC	**SAMPLER MOBILE: 0408 279212**	**RELINQUISHED BY:**	**RECEIVED BY:** JULIUS
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**		
Email Reports to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au		DATE/TIME:	DATE/TIME: 9/8/22 11:55
Email Invoice to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au			

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EG020F (LEAD)	EA200G (ASBESTOS)	S-12 (OC/OP)	S-2 (METALS)	S-7 - TRH/BTEXN/PAH	W-2T (METALS)	W-12 (OC/OP)	W7- TRH/BTEXN/PAH	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
15	BH15A	5/08/2022 0:00	S	ST	1			X	X	X				
16	BH16A	5/08/2022 0:00	S	ST	1			X	X	X				
17	BH17A	5/08/2022 0:00	S	ST	1			X	X	X				
18	BH18A	5/08/2022 0:00	S	ST	1			X	X	X				
19	BH19A	5/08/2022 0:00	S	ST	1			X	X	X				
20	BH20A	5/08/2022 0:00	S	ST	1			X	X	X				
21	BH21A	5/08/2022 0:00	S	ST	1		X	X	X	X				
22	BH22A	5/08/2022 0:00	S	ST	1		X	X	X	X				
23	BHDUP1	5/08/2022 0:00	S	ST	1	X	X							
24	BHDUP2	5/08/2022 0:00	S	ST	1			X	X	X				
~~25~~	BHTRIP1	5/08/2022 0:00	S	ST	1	X	X							INTERLAB
~~26~~	BHTRIP2	5/08/2022 0:00	S	ST	1			X	X	X				INTERLAB
25	BHRS1	5/08/2022 0:00	W	N,VOA,AG	3						X	X	X	
				TOTAL	15	2	4	10	10	10	1	1	1	

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 Speciation 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2223282**	Page	: 1 of 21
Client	: **HMC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MARK TUNKS	Contact	: Customer Services EB
Address	: SUITE 29, LEVEL 2 75-77 WHARF STREET TWEED HEADS 2485	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 5536 8863	Telephone	: +61-7-3243 7222
Project	: 2022.1106 Bruxner Highway GOONELLABAH	Date Samples Received	: 09-Aug-2022 11:55
Order number	: HMC2022.1106	Date Analysis Commenced	: 11-Aug-2022
C-O-C number	: ----	Issue Date	: 23-Aug-2022 09:11
Sampler	: MARK TUNKS		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 25		
No. of samples analysed	: 25		

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*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

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.

- EP075 (SIM): Where reported, 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.
- 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.
- 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.
- EG020-S (Soluble Metals by ICP-MS): Some samples show poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EG005T-Total Metals by ICP-AES: Sample 'BH12A' (EB2223282-012) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP071 Semivolatile TPH: Sample “EB2223297_052”showed poor matrix spike recovery. Insufficient volume for confirmation and re-extraction.
- EG005T (Total Metals by ICP-AES): BH2A (EB2223282-002) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH1A	BH2A	BH3A	BH4A	BH5A
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	EB2223282-001	EB2223282-002	EB2223282-003	EB2223282-004	EB2223282-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**22.0**	**32.1**	**29.5**	**26.7**	**33.3**
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	**124**	**219**	**388**	**145**	**88**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH6A	BH7A	BH8A	BH9A	BH10A
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	EB2223282-006	EB2223282-007	EB2223282-008	EB2223282-009	EB2223282-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**30.7**	**32.1**	**36.7**	**34.6**	**24.5**
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	**222**	**626**	**1640**	**320**	**2160**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH11A	BH12A	BH13A	BH14A	BH15A
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	EB2223282-011	EB2223282-012	EB2223282-013	EB2223282-014	EB2223282-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**32.0**	**33.6**	**23.1**	**37.4**	**36.1**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	**15**
Chromium	7440-47-3	2	mg/kg	**38**	**40**	**37**	**47**	**34**
Copper	7440-50-8	5	mg/kg	**52**	**19**	**24**	**17**	**24**
Lead	7439-92-1	5	mg/kg	**733**	**62**	**45**	**82**	**131**
Nickel	7440-02-0	2	mg/kg	**13**	**13**	**10**	**13**	**15**
Zinc	7440-66-6	5	mg/kg	**1380**	**1200**	**394**	**2620**	**4880**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.3**	<0.1	<0.1	**0.2**	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	**0.17**	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH11A	BH12A	BH13A	BH14A	BH15A
				Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		EB2223282-011	EB2223282-012	EB2223282-013	EB2223282-014	EB2223282-015
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	**0.17**	<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	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<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		**0.6**	<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		**1.3**	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		**1.4**	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		**0.9**	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		**0.7**	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH11A	BH12A	BH13A	BH14A	BH15A
				Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		EB2223282-011	EB2223282-012	EB2223282-013	EB2223282-014	EB2223282-015
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**1.0**	<0.5	<0.5	<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		**0.8**	<0.5	<0.5	<0.5	<0.5
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		**7.2**	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**1.0**	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**1.3**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.6**	**1.2**	**1.2**	**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		**180**	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**180**	<50	<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		**200**	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		**120**	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**320**	<50	<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
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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH11A	BH12A	BH13A	BH14A	BH15A
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	EB2223282-011	EB2223282-012	EB2223282-013	EB2223282-014	EB2223282-015
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	131	133	126	137	128
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	104	107	103	109	104
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	110	110	104	112	106
2-Chlorophenol-D4	93951-73-6	0.5	%	108	109	101	110	102
2.4.6-Tribromophenol	118-79-6	0.5	%	116	118	112	118	113
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	114	113	105	114	106
Anthracene-d10	1719-06-8	0.5	%	108	104	101	108	104
4-Terphenyl-d14	1718-51-0	0.5	%	105	102	98.2	106	101
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	81.4	78.0	87.1	81.8	85.9
Toluene-D8	2037-26-5	0.2	%	73.3	70.4	77.3	68.7	74.6
4-Bromofluorobenzene	460-00-4	0.2	%	80.6	78.8	84.1	77.6	81.3

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH16A	BH17A	BH18A	BH19A	BH20A
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	EB2223282-016	EB2223282-017	EB2223282-018	EB2223282-019	EB2223282-020
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	30.0	29.8	29.9	39.5	14.2
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	5
Chromium	7440-47-3	2	mg/kg	40	34	39	43	20
Copper	7440-50-8	5	mg/kg	17	11	9	20	49
Lead	7439-92-1	5	mg/kg	74	85	27	46	143
Nickel	7440-02-0	2	mg/kg	10	8	9	12	12
Zinc	7440-66-6	5	mg/kg	171	562	213	493	2750
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH16A	BH17A	BH18A	BH19A	BH20A
				Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		EB2223282-016	EB2223282-017	EB2223282-018	EB2223282-019	EB2223282-020
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<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		**0.7**	<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		**8.9**	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		**1.7**	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		**10.0**	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		**9.8**	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		**4.6**	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		**3.7**	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH16A	BH17A	BH18A	BH19A	BH20A
				Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit		EB2223282-016	EB2223282-017	EB2223282-018	EB2223282-019	EB2223282-020
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**3.6**	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		**1.0**	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**3.0**	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**1.3**	<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		**1.6**	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**49.9**	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**4.1**	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**4.4**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**4.6**	**1.2**	**1.2**	**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		**170**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		**120**	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**290**	<50	<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		**250**	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**250**	<50	<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
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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH16A	BH17A	BH18A	BH19A	BH20A
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00
Compound	CAS Number	LOR	Unit	EB2223282-016	EB2223282-017	EB2223282-018	EB2223282-019	EB2223282-020
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	132	129	135	128	133
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	98.4	104	108	104	104
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	114	108	113	105	112
2-Chlorophenol-D4	93951-73-6	0.5	%	109	105	109	100	107
2.4.6-Tribromophenol	118-79-6	0.5	%	122	112	116	111	114
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	118	110	114	108	115
Anthracene-d10	1719-06-8	0.5	%	113	102	106	103	106
4-Terphenyl-d14	1718-51-0	0.5	%	113	101	105	103	107
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	83.2	84.2	72.5	84.9	88.9
Toluene-D8	2037-26-5	0.2	%	71.4	72.7	72.5	71.8	76.5
4-Bromofluorobenzene	460-00-4	0.2	%	75.2	77.1	93.4	76.7	82.8

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH21A	BH22A	BHDUP1	BHDUP2	----
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2223282-021	EB2223282-022	EB2223282-023	EB2223282-024	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	----	27.8	----	----
Moisture Content	----	1.0	%	35.3	19.4	----	28.8	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	6	----	<5	----
Cadmium	7440-43-9	1	mg/kg	4	5	----	<1	----
Chromium	7440-47-3	2	mg/kg	43	131	----	38	----
Copper	7440-50-8	5	mg/kg	18	104	----	12	----
Lead	7439-92-1	5	mg/kg	127	203	337	50	----
Nickel	7440-02-0	2	mg/kg	13	55	----	9	----
Zinc	7440-66-6	5	mg/kg	2130	4970	----	374	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.9	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.06	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH21A	BH22A	BHDUP1	BHDUP2	----
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2223282-021	EB2223282-022	EB2223282-023	EB2223282-024	--------
				Result	Result	Result	Result	----
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	**0.06**	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	**1.2**	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	**1.2**	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	**0.8**	----	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH21A	BH22A	BHDUP1	BHDUP2	----
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2223282-021	EB2223282-022	EB2223282-023	EB2223282-024	--------
				Result	Result	Result	Result	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	0.5	mg/kg	<0.5	**0.7**	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	**0.8**	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	**0.6**	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	**5.3**	----	<0.5	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	**0.8**	----	<0.5	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**1.1**	----	**0.6**	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.4**	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	**110**	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	**170**	----	<100	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	**280**	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	**240**	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	**110**	----	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	**350**	----	<50	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	----	<50	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<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	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH21A	BH22A	BHDUP1	BHDUP2	----
			Sampling date / time	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	05-Aug-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2223282-021	EB2223282-022	EB2223282-023	EB2223282-024	--------
				Result	Result	Result	Result	----
EP080: BTEXN - Continued								
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	<1	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**133**	**138**	----	**128**	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**107**	**104**	----	**91.2**	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**112**	**115**	----	**109**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**105**	**108**	----	**101**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**110**	**113**	----	**107**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**117**	**120**	----	**108**	----
Anthracene-d10	1719-06-8	0.5	%	**104**	**108**	----	**102**	----
4-Terphenyl-d14	1718-51-0	0.5	%	**108**	**114**	----	**103**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**78.3**	**92.5**	----	**94.8**	----
Toluene-D8	2037-26-5	0.2	%	**66.3**	**76.0**	----	**81.7**	----
4-Bromofluorobenzene	460-00-4	0.2	%	**72.3**	**83.8**	----	**85.6**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS1	----	----	----	----
				Sampling date / time	05-Aug-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2223282-025	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----
^ Total Chlordane (sum)	----	0.5	µg/L		<0.5	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS1	----	----	----	----
				Sampling date / time	05-Aug-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2223282-025	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L		<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L		<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS1	----	----	----	----
				Sampling date / time	05-Aug-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2223282-025	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		102	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		82.8	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS1	----	----	----	----
				Sampling date / time	05-Aug-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2223282-025	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**34.3**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**90.9**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**97.1**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**94.6**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**96.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**83.1**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**104**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**97.1**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	138
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	23	134
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	154
2-Chlorophenol-D4	93951-73-6	42	153
2.4.6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	156
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	45	139
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	45	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	72
2-Chlorophenol-D4	93951-73-6	27	130
2.4.6-Tribromophenol	118-79-6	19	181
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	14	146
Anthracene-d10	1719-06-8	35	137
4-Terphenyl-d14	1718-51-0	36	154
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

Appendix 17 Round 2 – Chain of Custody and Laboratory Certificates

SEE FOLLOWING PAGES

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph:

☐W Ph:

Environmental Division
Brisbane
Work Order Reference
EB2226459

Telephone : +61-7-3243 7222

CLIENT: HMC Environmental Consulting Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT **(List due date):**	**FOR LAB** Custody Se. N/A
OFFICE: Tweed Heads		☐ Non Standard or urgent TAT **(List due date):**	Free ice / fr receipt? N/A
PROJECT: Bruxner Highway GOONELLABAH **PROJECT NO.:** 2022.1106	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Random Sa
ORDER NUMBER: HMC2022.1106	**COUNTRY OF ORIGIN:**	COC: 1 2 3 4 5 6 7	Other comm
PROJECT MANAGER: MARK TUNKS	**CONTACT PH:** 0755 368863	OF: 1 2 3 4 5 6 7	
SAMPLER: Matthew Flanagan HMC	**SAMPLER MOBILE:** 0408 279212	**RELINQUISHED BY:** DATE/TIME: 6/9/2022	**RECEIVED BY:** SP 12:30 DATE/TIME: 7/9/22	**RELINQUISHED** DATE/TIME:
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**			
Email Reports to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au				
Email Invoice to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: PLEASE HOLD UNTIL CLIENT APPROVAL CONFIRMED

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	EG020F (LEAD)								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH23A	5/09/2022 0:00	S	ST	1	X								
2	BH24A	5/09/2022 0:00	S	ST	1	X								
3	BH25A	5/09/2022 0:00	S	ST	1	X								
4	BH26A	5/09/2022 0:00	S	ST	1	X								
5	BH27A	5/09/2022 0:00	S	ST	1	X								
6	BH28A	5/09/2022 0:00	S	ST	1	X								
7	BH29A	5/09/2022 0:00	S	ST	1	X								
8	BH30A	5/09/2022 0:00	S	ST	1	X								
9	BH31A	5/09/2022 0:00	S	ST	1	X								
10	BH32A	5/09/2022 0:00	S	ST	1	X								
11	BH33A	5/09/2022 0:00	S	ST	1	X								
12	BH34A	5/09/2022 0:00	S	ST	1	X								
13	BH35A	5/09/2022 0:00	S	ST	1	X								
14	BH36A	5/09/2022 0:00	S	ST	1	X								
				TOTAL	14	14								

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 Speciation 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 3/1 Burma Road Pooraka SA 5095 Ph: 08 8162 5130 E: adelaide@alsglobal.com

BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Gladstone QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.Gladstone@alsglobal.com

MACKAY Unit 2/20 Caterpillar Drive Paget QLD 4740 Ph: 07 4952 5795 E: ALSEnviro.Mackay@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

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WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: HMC Environmental Consulting Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Tweed Heads		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
PROJECT: Bruxner Highway GOONELLABAH **PROJECT NO.:** 2022.1106	**ALS QUOTE NO.:**	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: HMC2022.1106	**COUNTRY OF ORIGIN:**	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: MARK TUNKS **CONTACT PH:** 0755 368863		OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Matthew Flanagan HMC **SAMPLER MOBILE:** 0408 279212	**RELINQUISHED BY:**	**RECEIVED BY:** SP	**RELINQUISHED BY:** **RECEIVED BY:**
COC Emailed to ALS? (YES / NO) **EDD FORMAT (or default):**	DATE/TIME: 6/9/2022	DATE/TIME: 7/9/22 12:30	DATE/TIME: DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au			
Email Invoice to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: PLEASE HOLD UNTIL CLIENT APPROVAL CONFIRMED.

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EG020F (LEAD)	S-12 (OC/OP)	S-2 (METALS)	S-7 - TRH/BTEX/NPAH	W7 - TRH/BTEX/NPAH	W-2T (METALS)	W-12 (OC/OP)		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
15	BH37A	5/09/2022 0:00	S	ST	1		X	X	X					
16	BH38A	5/09/2022 0:00	S	ST	1		X	X	X					
17	BH39A	5/09/2022 0:00	S	ST	1		X	X	X					
18	BH40A	5/09/2022 0:00	S	ST	1		X	X	X					
19	BH8B	5/09/2022 0:00	S	ST	1	X								
20	BH10B	5/09/2022 0:00	S	ST	1	X								
21	BHDUP3	5/09/2022 0:00	S	ST	1		X	X	X					
22	BHTRIP3	5/09/2022 0:00	S	ST	1		X	X	X					INTERLAB
23	BHRS2	5/09/2022 0:00	W	N,VOA,AG	3					X	X	X		
				TOTAL	11	2	6	6	6	1	1	1		

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 Speciation 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; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2226459**	Page	: 1 of 21
Client	: **HMC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MARK TUNKS	Contact	: Customer Services EB
Address	: SUITE 29, LEVEL 2 75-77 WHARF STREET TWEED HEADS 2485	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 5536 8863	Telephone	: +61-7-3243 7222
Project	: 2022.1106 Bruxner Highway GOONELLABAH	Date Samples Received	: 07-Sep-2022 12:30
Order number	: HMC2022.1106	Date Analysis Commenced	: 09-Sep-2022
C-O-C number	: ----	Issue Date	: 15-Sep-2022 17:59
Sampler	: MATTHEW FLANAGAN HMC		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 22		
No. of samples analysed	: 22		

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*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

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.

- EP075 (SIM): Where reported, 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.
- 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.
- 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.
- EP068 - Pesticides by GCMS: The LOR for Dieldrin has been raised for sample 'BH38A' due to matrix interference.
- EG005T (Total Metals by ICP-AES): Sample EB2226488-002 shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): BH23A (EB2226459-001) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): BH33A (EB2226459-011) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): BH24A (EB2226459-002) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH23A	BH24A	BH25A	BH26A	BH27A
			Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2226459-001	EB2226459-002	EB2226459-003	EB2226459-004	EB2226459-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**15.4**	**34.4**	**28.2**	**33.2**	**22.6**
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	**17**	**40**	**641**	**69**	**46**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH28A	BH29A	BH30A	BH31A	BH32A
			Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2226459-006	EB2226459-007	EB2226459-008	EB2226459-009	EB2226459-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**31.5**	**32.0**	**32.9**	**36.0**	**37.4**
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	**84**	**224**	**177**	**885**	**35**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH33A	BH34A	BH35A	BH36A	BH37A
			Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2226459-011	EB2226459-012	EB2226459-013	EB2226459-014	EB2226459-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	32.3	33.7	36.2	35.6	----
Moisture Content	----	1.0	%	----	----	----	----	31.6
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	----	----	<5
Cadmium	7440-43-9	1	mg/kg	----	----	----	----	3
Chromium	7440-47-3	2	mg/kg	----	----	----	----	39
Copper	7440-50-8	5	mg/kg	----	----	----	----	32
Lead	7439-92-1	5	mg/kg	1120	720	1750	176	162
Nickel	7440-02-0	2	mg/kg	----	----	----	----	12
Zinc	7440-66-6	5	mg/kg	----	----	----	----	630
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	----	0.3
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	----	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH33A	BH34A	BH35A	BH36A	BH37A
				Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit		EB2226459-011	EB2226459-012	EB2226459-013	EB2226459-014	EB2226459-015
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	----	----	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	<0.5
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		----	----	----	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	----	----	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	----	----	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	----	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH33A	BH34A	BH35A	BH36A	BH37A
			Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2226459-011	EB2226459-012	EB2226459-013	EB2226459-014	EB2226459-015
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	<0.5
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
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	<0.5
^ 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	----	----	----	----	<100
C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	<50
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	----	----	----	----	<50
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	<100
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	<50
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	BH33A	BH34A	BH35A	BH36A	BH37A
			Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2226459-011	EB2226459-012	EB2226459-013	EB2226459-014	EB2226459-015
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ Total Xylenes	----	0.5	mg/kg	----	----	----	----	<0.5
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	----	----	87.5
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	----	----	90.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	106
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	102
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	102
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	92.4
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	111
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	119
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	86.7
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	72.6
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	82.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH38A	BH39A	BH40A	BH8B	BH10B
			Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2226459-016	EB2226459-017	EB2226459-018	EB2226459-019	EB2226459-020
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	----	----	34.4	32.4
Moisture Content	----	1.0	%	32.8	26.3	28.8	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	1	----	----
Chromium	7440-47-3	2	mg/kg	43	26	51	----	----
Copper	7440-50-8	5	mg/kg	22	21	13	----	----
Lead	7439-92-1	5	mg/kg	106	16	34	146	783
Nickel	7440-02-0	2	mg/kg	11	18	13	----	----
Zinc	7440-66-6	5	mg/kg	446	154	562	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.10	<0.05	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH38A	BH39A	BH40A	BH8B	BH10B
				Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit		EB2226459-016	EB2226459-017	EB2226459-018	EB2226459-019	EB2226459-020
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<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	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH38A	BH39A	BH40A	BH8B	BH10B
				Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit		EB2226459-016	EB2226459-017	EB2226459-018	EB2226459-019	EB2226459-020
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<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	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH38A	BH39A	BH40A	BH8B	BH10B
			Sampling date / time	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EB2226459-016	EB2226459-017	EB2226459-018	EB2226459-019	EB2226459-020
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	89.3	72.6	77.6	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	133	81.1	86.0	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	102	107	106	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	110	110	113	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	110	116	108	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	97.8	83.5	86.9	----	----
Anthracene-d10	1719-06-8	0.5	%	115	95.1	93.1	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	145	98.3	102	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	80.3	89.1	91.2	----	----
Toluene-D8	2037-26-5	0.2	%	66.8	77.0	73.8	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	78.6	84.4	82.0	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BHDUP3	----	----	----	----
			Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2226459-021	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**27.4**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**27**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**30**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**24**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**23**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**133**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BHDUP3	----	----	----	----
			Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2226459-021	--------	--------	--------	--------
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
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	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BHDUP3	----	----	----	----
				Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2226459-021	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ 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		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
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		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
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	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BHDUP3	----	----	----	----
			Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2226459-021	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**76.9**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**120**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**109**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**109**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**114**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**83.1**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**97.6**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**102**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**90.1**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	**79.6**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**86.5**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS2	----	----	----	----
				Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2226459-022	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.003**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----
^ Total Chlordane (sum)	----	0.5	µg/L		<0.5	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS2	----	----	----	----
				Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2226459-022	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L		<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L		<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS2	----	----	----	----
				Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2226459-022	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		**92.7**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		**91.1**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BHRS2	----	----	----	----
				Sampling date / time	05-Sep-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2226459-022	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**36.5**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**106**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**100**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**72.5**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**109**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**132**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**93.8**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**103**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**94.8**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	138
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	23	134
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	154
2-Chlorophenol-D4	93951-73-6	42	153
2.4.6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	156
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	45	139
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	45	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	72
2-Chlorophenol-D4	93951-73-6	27	130
2.4.6-Tribromophenol	118-79-6	19	181
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	14	146
Anthracene-d10	1719-06-8	35	137
4-Terphenyl-d14	1718-51-0	36	154
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118