Detailed Site Investigation
Planning Proposal (PP20/003)

Location:

Lot 1 DP 1032820
1 Walmsleys Road
Bilambil Heights NSW

Prepared for:

Bilambil Holding Pty Ltd

Report No:

HMC2021.079.02

February 2022

HMC environmental consulting pty ltd

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RE: Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW

HMC Environmental Consulting Pty Ltd is pleased to present our report for a Detailed 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)

Document Control Summary			
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EXECUTIVE SUMMARY

Background

A planning proposal (PP20/0003) is proposed for a rural landholding located at Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW (site). The intended outcome of this planning proposal is to amend Tweed Local Environmental Plan 2014 to facilitate:

1. Consolidation of land zoned R1 General Residential, and
2. Protection, consolidation, and enhancement of native vegetation on the remainder of the allotment.

The aim of the PP is to amalgamate the R1 General Residential zoned land to facilitate a mix of medium density development and mixed-use development, while at the same time consolidating and enhancing native vegetation on the site, and rezoning this area to RE2 Private Recreation as an interim measure until the council completes its review of E zones across the shire, at which point a suitable E zone may be applied.

It is understood that part of the site is already zoned R1 General Residential, with the balance of the site zoned as a Deferred Matter (DM). This DM area was formerly zoned 7(I) Environmental Protection (Scenic/Escarpment) as per the Tweed Local Environmental Plan 2000.

HMC Environmental Consulting (HMC) was engaged by Bilambil Holdings Pty Ltd (proponent) to undertake the required investigation and assess the site for potential contamination to support the planning proposal (PP20/0003).

A *Preliminary Site Investigation* (PSI) (HMC2021.079.01), including a desktop assessment of available information, and a detailed site inspection, was prepared by HMC in July 2021. The report found that the property was subject to cropping/plantations prior to 1962, which may have been subject to agrichemical applications, a potentially contaminating activity. The report also found that existing and demolished farm sheds on the site, may have been associated with chemical and fuel/oil storage, leaks and spills. These areas are recognised as hotspots, and require more intensive investigation. The PSI was lodged to council with following conclusions and recommendations:

In relation to potential site contamination associated with current and former land use on Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW, further investigation including a detailed soil investigation would be required for any proposed development within or surrounding areas that have been identified as being subject to potentially contaminating activities.

Following a review of the submitted PSI, an information request was received via email from Tweed Shire Council on 12 and 13 October 2021 requesting additional information, including a soil investigation, to satisfy the Local Planning Direction 2.6(4) and *Consultants reporting on contaminated land – Contaminated land guidelines* (NSW EPA, 2020). The information request also noted that, given the age, and history, of the current and demolished buildings, asbestos was also to be considered a potential contaminate of concern (PCoC). The detailed site investigation was also to include information on the previously identified illegal fill on the property to identify any PCoC.

HMC has completed additional investigation of the site, including a soil investigation, to assess the identified areas of concern (AoC).

Objectives

The objectives of the Detailed Site Investigation (DSI) are to:

1. To provide additional information to support the Preliminary Site Investigation (HMC2021.079.01) and assess and, where required, delineate the identified Areas of Concern (AoC) including
    a. former cropping areas,

b. current and demolished structures potentially used for storage/use of chemicals and/or fuel and oil and asbestos
c. fill material from unknown source placed on the eastern boundary of the site for potential contaminants of concern (PCoC).

2. Determine the suitability of the proposed R1 zoned land subject to potential residential and surrounding recreational land use and the need for further investigation or remediation.

Scope Of Works

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

- Additional desktop assessment of current and former land use including a review of the following report:
  - *Preliminary Site Investigation for Rezoning Planning Proposal at Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW* prepared by HMC Environmental Consulting dated July 2021 (HMC2021.079.01)
- Soil investigation including:
  - Collection of 15 primary surface soil samples + 2 x QA/QC soil samples in the former cropping area, and laboratory analysis for potential contaminants of concern (PCoC) including total metals, and organochlorine/organophosphorus chemicals.
  - Collection of 8 primary surface soil samples + 2 x QA/QC soil samples around the former dairy bales, and in and around the demolished former shed site, and laboratory analysis for potential contaminants of concern (PCoC) including total metals, organochlorine/organophosphorus chemicals, and petroleum hydrocarbons.
  - Inspection of assumed, fill from unknown source, location.
- Preparation of a Detailed Site Investigation report including:
  - review of previous site contamination reporting, and results of the site inspection.
  - assessment of potentially contaminating activities, PCoC and areas of concern (AoC).
  - review and interpretation of sample results against investigation criteria
  - conclusions and recommendations including suitability of site for the proposed R1 zoned land subject to potential residential and surrounding recreational land use and need for further investigation, remediation, or ongoing site management.

Conclusions/Recommendations

The Detailed Site Investigation conclusions are based on the information described in this report and appendices, and the Preliminary Site Investigation (HMC 2021.079.01) dated July 2021 and should be read in conjunction with the complete reports, including limitations.

A planning proposal (PP20/0003) is proposed for a rural landholding located at Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW. The PSI provided information confirming that historic cropping had previously taken place for areas proposed for future residential development. It also identified an existing farm shed and former farm shed (demolished).

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. Surface samples recorded laboratory results showing all organochlorine and organophosphorus chemicals, together with BETX, TPH and PAH were all below the investigation criteria. Metal results were generally typical of background levels and below the investigation criteria. A single copper result within the existing shed sampling location exceeded the EIL investigation criteria.

There were numerous exceedances in the lead HIL A investigation criteria and zinc EIL investigation criteria. These results also exceeded the statistical analysis criteria. The high concentrations were generally limited to the around within and immediately surround the existing shed and the previously demolished shed.

If future development in the area in the vicinity of the existing shed and previously demolished shed, included residential land use, then soil remediation would likely be required. The metal impacted soil is located in a small accessible part of the site, and there are several remediation options that are not complex and well understood. The final remediation strategy would depend on the proposed land use, and soil disturbance, and there can be no detail in this early planning stage. The identified soil contamination is not an absolute constraint, and is easily managed, if required.

There are a number of remediation options on this large rural site including:

- fixing the metal contaminants in the current location and capping with clean fill with a Site management Plan to prevent disturbance or
- excavating the impacted soil and
    - re-interring in a location on site with a Site Management Plan to prevent disturbance
    - removal off-site to an approved landfill facility

It would not appear appropriate to prepare a Remedial Action Plan at early planning approval stage, as these matters would be addressed at the Development Application stage.

In relation to potential site contamination associated with former land use, Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW, as shown in Appendix 2 of this report, is considered suitable for the proposed rezoning and future residential land use, subject to:

1. further investigation and preparation of a remedial action plan by a suitably qualified consultant, to be undertaken prior to the submission of a development application. The Remedial Action Plan is to address the metal-impacted soil on the southern part of the site, in the vicinity of the existing farm shed and previously demolished farm shed, to the satisfaction of the General Manager of Tweed Shire Council of the contaminated soil.

In relation to potential site contamination associated with former land use, further investigation and remediation is required for the farm shed and dairy bales and immediate surrounds located at Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW, as shown in Appendix 2 of this report.

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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	Bilambil Holding Pty Ltd
CLM Act	*Contaminated Land Management Act 1997*
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the environment
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
Investigation Area	Proposed dwelling and immediate surrounds
LOR	Laboratory level of reporting
mBGL	Metres below ground level
MNA	Monitored natural attenuation
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
SAQP	Sampling and analysis quality plan
Site	Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW
TCLP	Toxicity Characteristic Leaching Procedure

1 INTRODUCTION

1.2 Background

A planning proposal (PP20/0003) is proposed for a rural landholding located at Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW (site). The intended outcome of this planning proposal is to amend Tweed Local Environmental Plan 2014 to facilitate:

1. Consolidation of land zoned R1 General Residential, and
2. Protection, consolidation, and enhancement of native vegetation on the remainder of the allotment.

The aim of the PP is to amalgamate the R1 General Residential zoned land to facilitate a mix of medium density development and mixed-use development, while at the same time consolidating and enhancing native vegetation on the site, and rezoning this area to RE2 Private Recreation as an interim measure until the council completes its review of E zones across the shire, at which point a suitable E zone may be applied.

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HMC has completed additional investigation of the site, including a soil investigation, to assess the identified areas of concern (AoC).

This report should be read in conjunction with the *Preliminary Site Investigation* Report HMC2021.079.01 prepared by HMC Environmental Consulting dated July 2021.

1.3 Project Description

The project relates to a planning proposal to rezone the site. The proposal is to amalgamate the existing land use zoning for residential development R1 under the Tweed Local Environmental Plan 2014 and enhance the biodiversity conservation potential of the remaining land.

The intended outcome of this planning proposal is to amend Tweed Local Environmental Plan 2014 to facilitate:

1. Consolidation of land zoned R1 General Residential, and
2. Protection, consolidation, and enhancement of native vegetation on the remainder of the allotment.

Currently a narrow band of R1 zoned land extends north through the central ridge line from the southern boundary. A similar sized area of R1 zoned land extends east-west across the northern part of the site. These two areas are bisected by a Deferred Matter zoned land which is a deferred environmental zoning from the previous Tweed Local Environmental Plan 2000. The objective of the new LEP provision is to amalgamate the existing land use zoning for residential development R1 and enhance the biodiversity conservation potential of the remainder of the site, where there is the exact same area of residential zoned land and biodiversity conservation land are maintained in the exact same proportions resulting in no net increase to either land uses.

A conceptual masterplan has been prepared and this plan provides an example of potential build forms (See Appendix 2). The plan shows 5 build forms located around a central recreation area within a proposed development area, located wholly within the proposed R1 zoning.

1.4 Objective of the Investigation

The objectives of the Detailed Site Investigation (DSI) are to:

1. To provide additional information to support the Preliminary Site Investigation (HMC2021.079.01) and assess and, where required, delineate the identified Areas of Concern (AoC) including
    a. former cropping areas,
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  - conclusions and recommendations including suitability of site for the proposed R1 zoned land subject to potential residential and surrounding recreational land use and need for further investigation, remediation, or ongoing site management.

2 SITE INFORMATION

2.1 Site Identification

Table 1 - Site Identification Summary

Street Address		1 Walmsleys Road, Bilambil Heights, NSW 2486
Allotment size		6.28 ha
Allotment Description		Lot 1 DP 1032820
Property No.		44352
Local Government		Tweed Shire
Parish		Terranora
County		Rous
Geographical Coordinates (MGA Zone 56)		Easting: 548995.35 Northing: 6880884.53 (Approximate centre of site).
Existing Zoning (TLEP)		R1 General Residential DM Deferred Matter
Proposed Zoning		R1 General Residential & RE2 Private Recreation
Proposed Zoning (Future Intent)		R1, Environmental Protection Zones E2 & E3. Note: As of 1 December 2021, a reference to an Environment Protection zone E1, E2, E3 or E4 in a document should be taken to be a reference to a Conservation zone C1, C2, C3 or C4.
Land use - Existing		Existing residential and agricultural. Existing farmhouse and pool. Existing relocated dairy bale, garage, and detached occupancy. Remnant orchards and re-growth areas.
Land use - Proposed		Residential and recreation.
Site Services		Power. Water. Sewerage
Surrounding land uses	**North**	Native forest and re-growth. Sporting fields.
	East	Residential
	South	Native vegetation and re-growth. Residential.
	West	Agricultural (cattle grazing), rural residential
Closest Sensitive Environment		Stormwater would flow north, northeast and northwest into gullies running along either side of the property, and through intermittent watercourses into an existing dam, discharging eventually into the Cobaki Creek approximately 1.5km northwest of site.

Table 2 – Site Characteristics

Topography	The topography is distinctive with a gently sloping central, north-south oriented ridge that extends north into the site before steeply dropping away further north. The ridge slopes steeply into gullies on the east and west that then rise to the boundaries. The topography forms a catchment that directs stormwater north to an off-site dam The elevation (Google Earth) ranges from 12m – 86m AHD elevation across the site
Regional Geology (Hashimoto el al 2008)	Bedrock geology Pzs: Cambro-Ordovician, Devonian and Carboniferous sedimentary rocks, minor volcanic rocks (Central Block and Coffs Harbour Block)
Soil Landscape (Morand, 1996)	Generally Billinudgel (bi) with a small area of Carool variant a (caa) in the south-west corner of the site **bi soil landscape (Expected)** Yellow and Red Podzolics (GSG) or Chromosols (ASC). **caa soil landscape (Expected)**

	Well drained Krasnozems on upper slopes and crests, Well drained chocolate soils on slopes and imperfectly drained brown earths elsewhere. Variant a has smaller basalt caps with lower relief and gentler slopes.
Australian Soil Classification https://www.environment.nsw.gov.au/eSpade2Webapp	**Kurosols (KU)** Soils with strong texture contrast between A horizons and strongly acidic B horizons. Many of these soils have some unusual subsoil chemical features (high magnesium, sodium, and aluminium). **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 (TSC GIS)	Groundwater vulnerability – Moderate to Moderately High The investigation area is located on an elevated, mid to low slopes and groundwater would not be expected to be intercepted <5m depth. Groundwater flow direction would be expected to follow the topography and generally northwest towards Cobaki Creek
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 GW052771 approx. 380m east of the investigation area. This bore is registered for monitoring use only for the Seagulls Club.

3 SITE HISTORY

3.1 Ownership

The property is currently owned by Bilambil Holdings Pty Ltd. A review of the title information via the online Land and Property Information portal on 1 April 2021 provides the following information:

Table 3 – Property Ownership

Folio Description	Date of Folio	Search Date	Ownership Details
1/1032820	14/8/2015	01/04/2021	Bilambil Holdings Pty Ltd

4 SITE INSPECTIONS

A site inspection was completed on 26th April 2021 by M Flanagan & T Richards of HMC during the preparation of the PSI.

For the current investigation, a

- 7 December 2021 - site inspection by M Tunks and M Flanagan of HMC that included collection of surface soil samples across former cropping area and surrounding existing and demolished structures that may have been used for chemical/fuel mixing and storage.
- 28 January 2022 - site inspection by M Tunks of HMC to assess access to fill site following work including removal of invasive overgrown grass and weeds.

The site is generally accessible from Walmsleys Road on the southern boundary. The property is located on the slopes of a ridgeline, with the existing structures towards the top of the ridge and steep sloping towards the eastern, western and northern boundaries. The ground surface consisted primarily of native and exotic grass cover with numerous scattered mature trees over the property. Small remnant custard apples, star fruit and pecan trees are located on the property. There was an existing dwelling and pool, with a large, detached garage

located north of the dwelling, and an existing shed (former dairy bale now vehicle accommodation), and detached occupancy to the west. Further west are the remnants of a former farm shed (demolished).

The property is a mix of scattered vegetation, generally along the boundaries of the property, and cleared pasture. Some abandoned custard apple and pecan trees are still present on the property. An existing dwelling, and a number of farm sheds are also located near the southern boundary fronting Walmsleys Road.

Anecdotal information from Ned Wales indicated a shed was constructed prior to 1972 and a granny flat prior to 1987. A large garage was also constructed off the north side of the dwelling prior to 1987. Ned Wales stated that the garage and granny flat were constructed by a past owner in the late 1970s. The shed became dilapidated over time and demolished prior to 2015. No other changes to existing structures were noted in the investigation.

The fill site located near the eastern boundary was inaccessible on 7 December 2021 and manual clearing was undertaken by Mr Wales during late January 2022. The site visit by HMC on 28 January 2022 did not indicate exposed fill. Some gravelly material was noted, however ,this was immediately beside a manhole and was likely from drainage installation. Further detail is provided in section 5.

4.1 Summary of Site Conditions

Table 4 provides a summary of observations during the site inspection.

4.2 Site photographs

See Appendix 6.

4.3 Site History Summary

Based on a search of available historical aerial photography and topographical mapping, the property appears to have been generally cleared of native vegetation prior to 1962. A dwelling and a shed (remnant only remaining) to the west, were present on the property prior to 1962. Cropping was visible around the dwelling in the 1962 historic aerial but had been cleared prior to 1972. Anecdotal advice, via an interview, indicated bananas plantation(s) may have been present on the site in the early 1900s and a photo dated 1918 shows some cropping (possibly orchard, banana plantation) on the southern part of the site.

The eastern boundary of the site bordered a fill site that was subject to investigation by Tweed Shire Council. Council enquiries revealed the source of the mixed fill had not been confirmed. As a portion of the fill extended onto a steep sloping area that may have been unstable, some of this material was accepted onto the subject site.

Large portions of the property, particularly along the boundaries, have been reclaimed by vegetation as the property was largely neglected in the 1980s.

Table 4 - List of Contaminants of Potential Concern (CoPC) and Areas of Concern (AoC)

AOPC	COPC	Description and common relationship
Historic land uses; Historic Cropping	Organochlorine and organophosphorus pesticides (OCP/OPP) – DDT and breakdown products	Pest control
	Heavy metals	Pest control, fungal control, weed control & fertiliser contaminants.
Demolished Farm shed + Former Dairy Bales (Hotspots)	Above + asbestos, petroleum hydrocarbons, benzene, toluene, ethyl benzene, xylene (BTEX), volatile and semi-volatile Total Recoverable	Fuel & oil storage, Agrichemical mixing or spill areas

	Hydrocarbons (C6-C40), Polyaromatic hydrocarbons (PAH).	
Imported mixed fill from an unknown source	Heavy metals + foreign material, asbestos, petroleum hydrocarbons, benzene, toluene, ethyl benzene, xylene (BTEX), volatile and semi-volatile Total Recoverable Hydrocarbons (C6-C40), Polyaromatic hydrocarbons (PAH).	

5 FILL MATERIAL INVESTIGATION

The fill material is located near the eastern boundary in an inaccessible part of the site and would be within the proposed environmental protection zoning where no future development or disturbance would be permitted.

Tweed Shire Council requested that this area be investigated. M Tunks & M Flanaghan of HMC attempted to enter the site on 7 December 2021 off Scenic Drive to identify the affected area and if possible collect representative samples of the material for laboratory analysis for PCoC. Due to the overgrown dense exotic grasses and other vegetation, it was not possible to enter the assumed fill location.

After advising the proponent of the difficulty in gaining access to the fill site and the annual holiday season, there was an attempt over a number of days to clear a path through the material to reach the assumed fill location. A 100m long path cleared by hand was completed on 25 January 2022, and M Tunks of HMC visited the site on 28 January 2022 to assess access, and possibility of collecting samples. The ground surface was matted with heavy grass roots, and some surficial clearing of this material revealed soil typical of the site. There was some gravelly material but this was near a manhole and may have been due to the drainage excavation.

Following the difficulties in clearing the area and possibly disturbing any placed material on the site, it was agreed that further disturbance in this area would only potentially result in possible erosion and sediment movement during the current weather conditions.

In summary, the exact location of the fill that was placed on the site to assist the stabilisation of sloping land on an adjoining property, has not been identified. Access to the assumed location was attempted using hand tools to minimise site disturbance. A site visit by HMC was not able to identify fill material within the densely matted root zone, exposed by the hand clearing operations. Further disturbance of this area is not recommended as this may encourage transport of exposed soil and other material. It is noted that future disturbance of this area would not occur and an objective of the planning proposal is the protection, consolidation, and enhancement of native vegetation within this area.

6 APPLICABLE INVESTIGATION LEVELS AND INVESTIGATION CRITERIA

6.1 Permitted Land Uses within proposed Zoning

The Tweed Local Environment Plan 2014 (TLEP) includes the following objectives of the proposed R1 General Residential zone:

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To encourage the provision of tourist accommodation and related facilities and services in association with residential development where it is unlikely to significantly impact on amenity or place demands on services beyond the level reasonably required for residential use.

The following listed development types are permitted in the R1 zone with consent:

Attached dwellings; Bed and breakfast accommodation; Boarding houses; Centre-based child care facilities; Community facilities; Dwelling houses; Food and drink premises; Group homes; Home industries; Hostels; Kiosks; Markets; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Residential flat buildings; Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Serviced apartments; Shop top housing; Tank-based aquaculture

The applicable investigation levels for the proposed land zoning must address the most sensitive potential land use. In this circumstance, a sensitive residential land use exposure setting would appear appropriate.

6.2 Soil Criteria

The proposed land zoning changes and future land use opportunities may increase the number of persons residing on the property. Currently the site is vacant, rural land with an existing dwelling, detached occupancy, former bales used for vehicle accommodation.

The planning profile would allow for residential development which would include increase occupancy on the property, and therefore, the exposure to PCoC may be increased. Final exposure would depend on the soil concentrations of PCoC, and the likely use of the land in the vicinity of the historic cropping and shed locations. The applicable exposure settings for potential soil disturbance associated with the potential land use would be:

- **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 (1995)** ***Sampling Design Guidelines*** – were followed during design of the sampling and analysis plan and predetermination of data quality objectives (DQOs).
- **SEPP 55 (1998)** ***State Environmental Planning Policy No. 55 – 'Remediation of Land*** **–** 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 5 - 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				
Benzene (mg/kg)			0.6	65
Toluene (mg/kg)			480	105
Ethyl Benzene (mg/kg)			NL	125
Total Xylenes			110	45
Total Petroleum Hydrocarbons				
C6-C10			40	180
>C10-C16			230	120
>C16-C34				1300
>C34-C40				5600
Total >C10-C40				
Polyaromatic Hydrocarbons				
Napthalene			4	170
Benzo-pyrene				0.7
Carcinogenic PAHs (as BaP TEQ)	3			
Total PAH	300			

(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

6.3 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 historic cropping and shed locations where soil might be disturbed during earthworks, or subject to movement due to erosion (rain) or wind (dust). In this circumstance, the upper part of the soil profile would be disturbed during earthworks associated with the future construction of residential developments.

6.4 Investigation Criteria

The investigation criteria are based on the Health Investigation Level deemed relevant for the proposed land use in clayey soil. The Ecological Investigation Level applies to ecological receptors and are relevant within 2m of the ground surface.

Groundwater was expected to be at >5m depth near the investigation area with clayey soil. No groundwater investigation was completed during this preliminary investigation. If surface soil investigation recorded elevated COPC 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 agrichemical soil contamination associated with historical land use (former cropping land)
- Potential agrichemical and fuel soil contamination associated with historical land use (current and former shed structures) on land proposed for rezoning.
- Potential asbestos containing material (ACM) fragments associated with debris from former shed (demolished)
- ***Identify the Decisions/Goals***
- Soil concentrations of PCoC to meet adopted investigation criteria based on future rezoning and potential residential land use.
- ***Identify Information Inputs***
- Soil organochlorine, organophosphate, and metal concentrations (former cropping area),
- Above + BTEX, petroleum hydrocarbons, PAH in the current and former shed structures,
- 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 7.
- ***Define the Study Boundaries***
- Investigation area is generally confined to the former cropping areas, and the current and former shed locations, which after rezoning, as shown in Appendix 2 of this report, may be subject to future development. The NSW EPA (1995) guidelines were used to calculate the sampling intensity for the former cropping areas. A more intensive, targeted sampling approach was used for the current and former shed locations.
- ***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 soil can remain in-situ and the investigation area would be suitable for the proposed rezoning.
- ***Specify the Acceptance Criteria***

- Investigation criteria – 95% UCL < HIL & EIL, Standard Deviation <50% HIL & EIL, maximum <250% HIL & EIL. - see table 7
-
- ***Investigation Criteria***
- See table 7
- ***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 and surrounds to assess that 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 chemical use in soil previously subjected to cropping and around the current and former shed.

A systematic sampling approach was adopted for the former cropping area. Fifteen (15) primary soil samples plus 2 x QA/QC's were collected from the investigation area that included the identified extent of former cropping.
A strategic targeted sampling approach was adopted for the current and former shed. Nine (9) primary soil samples plus 2 x QA/QC's were collected from the area in and around the structures.

Surface soil sampling was adopted as any soil exposure would be to the surface soil and any agrichemical application or spillages would be to the ground surface. NSW EPA (1997) recommends 0-150mm sampling interval for former cultivated cropping areas.

The sampling was completed on 7th December 2021 for the investigation area as shown in Appendix 4.

The following basic measures were undertaken by HMC Environmental Consulting 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 and M. Flanagan of HMC Environmental Consulting, with experience in site contamination investigations.
- Clean stainless-steel trowels were used to collect samples from immediately below the root zone and detritus layer, where present, (former cropping - 0-150mm) using disposable nitrile gloves. The trowels were decontaminated between samples 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.

A walkover survey of the existing shed and former shed locations was also completed to assess the soil surface for ACM fragments.

9 QUALITY ASSURANCE AND QUALITY CONTROL

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

Table 4 – Soil Quality Control Samples

Primary Sample ID	Type	Quality Control Sample ID	Laboratory	Analytes
WR9A	Duplicate	WRDUP	ALS, Brisbane	OCPS, OPPS, and Metals
	Triplicate	WRTRIP	ALS, Sydney	OCPS, OPPS, and Metals
CB2A	Duplicate	CBDUP	ALS, Brisbane	OCPS, OPPS, Metals, PAH, TRH, and BTEX
	Triplicate	CBTRIP	ALS, Sydney	OCPS, OPPS, Metals, PAH, TRH, and BTEX

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

Table 5 - 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%	All soil results recorded an RPD of <30%
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 field duplicate and triplicate results <50% RPD or less than 10 times the LOR. The field duplicate result for CB2A lead was 71.65% RPD. The field triplicate results for CB2A Endosulfan and Total >C10-C40 were 172.97% RPD and 66.67% RPD respectively.
Accuracy		
Matrix spike sample results reported with prescribed limits	Limits set by the laboratory: • Results to be between 70-130%.	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 accredited	Analysis to be completed by a NATA accredited laboratory.	All analysis NATA accredited

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 (10) 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 18th November 2021.

Table 6 – Sample Locations

Primary Sample	Location	Depth (mm)	ID	Soil Description	Laboratory Program
WR1A	The extent of the former cropping area Systematic surface soil sampling	0-150mm	Primary	Moist, reddish brown, clay loam soil	OCPs, OPPs, and Metals
WR2A					
WR3A					
WR4A					
WR5A					
WR6A					
WR7A				Moist, light brown/yellow, gravelly clay loam soil	
WR8A				Moist, reddish brown, clay loam soil	
WR9A					
WR10A					
WR11A				Moist, light brown/yellow, gravelly clay loam soil	
WR12A				Moist, reddish brown, clay loam soil	
WR13A					
WR14A					
WR15A					
WRDUP			Duplicate QA/QC		
WRTRIP			Triplicate QA/QC		
BS1A	Within and surrounding the former shed Strategic surface soil sampling		Primary		OCPs, OPPs, Metals, PAH, TRH and BTEX
BS2A					
BS3A					
BS4A					
BS5A					
CB1A	The immediate surround of the former dairy bales Strategic surface soil sampling			Moist, reddish brown, light clay soil	
CB2A				Moist, reddish brown, clay loam soil	
CB3A					
CB4A					
CBDUP			Duplicate QA/QC		
CBTRIP			Triplicate QA/QC		

A total of 24 primary surface (0-150mm) soil samples (plus 4 x QA/QC) soil samples were recovered and placed in laboratory supplied glass jars. The primary samples, together with the QA/QC samples and 2 x field rinsates were transported to the HMC office for refrigerated storage prior to delivery to ALS Environmental laboratory for analysis for PCoC.

Refer to **Appendix 4** 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

A total of 24 primary samples were submitted for analysis.
Fifteen 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)

Nine (9) 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).

Asbestos - visual only in the vicinity of the existing and former (demolished) sheds

10.4 Primary and Replicate Results

The laboratory analysis of the selected primary samples is summarised in Table 7.

Table 7 – Laboratory Results Summary (7 December 2021)

Parameter	Number of primary samples	LOR (mg/kg)	Criteria Exceedances	Range (mg/kg)	Typical Background (Olszowy et al, 1995) mg/kg
METALS/METALLOIDS					
Arsenic	24	5	0	<5-11	5-53
Chromium	24	2	0	7-58	5-56
Copper	24	5	**2**	<5-**541**	3-412
Nickel	24	2	0	<2-29	5-38
Zinc	24	5	**6**	13-**3920**	5-92
Cadmium	24	1	0	<1-8	nd
Lead	24	5	**6**	6-**3560**	5-56
Mercury (inorganic)	24	0.1	0	<0.1-0.3	nd
ORGANOCHLORINE/ORGANOPHOSPHORUS					
Chlordane	24	0.05	0	<0.05	
Dieldrin + Aldrin	24	0.05	0	<0.05-1.19	
DDT+DDD+DDE	24	0.05	0	<0.05-3.19	
Heptachlor	24	0.05	0	<0.05	
Chlorpyrifos	24	0.05	0	<0.05	
Endosulfan	24	0.05	0	<0.05-0.82	
Endrin	24	0.05	0	<0.05	

BTEX					
Benzene (mg/kg)	9	0.2	0	<0.2	
Toluene (mg/kg)	9	0.5	0	<0.5	
Ethyl Benzene (mg/kg)	9	0.5	0	<0.5	
Total Xylenes	9	0.5	0	<0.5	
TOTAL PETROLEUM HYDROCARBONS					
C6-C10	9	10	0	<10	
>C10-C16	9	50	0	<50-70	
>C16-C34	9	100	0	<100-730	
>C34-C40	9	100	0	<100-420	
Total >C10-C40	9	50	0	<50-1220	
POLYAROMATIC HYDROCARBONS					
Napthalene	9	0.5	0	<0.5	
Benzo-pyrene	9	0.5	0	<0.5	
Total PAH	9	0.5	0	<0.5	

* Health Investigation Levels for residential "A" land use (HIL A) for clay 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

* Investigation criteria exceedances are in bold

10.4.1 Soil Asbestos

A walkover survey was completed in the estimated location of the former (demolished) shed and the existing shed. The survey included traversing the area in approximate 1.2m transects (subject to access with structures and trees). M Tunks of HMC completed the visual observation survey and did not detect any fragments of asbestos containing material.

Asbestos may be present in existing structures and, if identified, during investigations for the preparation of a development application, would be managed by a Safework NSW licensed contractor.

10.5 QA/QC Laboratory Data Review

10.5.1 Relative percent difference (RPD)

The results show very good correlation between the primary sample (WR9A) and the field replicate (WRDUP). Correlation was within the recommended 0-50% range. The results show very good correlation between the WR9A and the triplicate (WRTRIP) sample.

The results showed generally good correlation between the primary sample (CB1A) and the field replicate (CBDUP). Correlation was generally within the recommended 0-50% range or was below 10 times the LOR. Lead had an RPD of 71.65%. The results show good correlation between the CB1A and the triplicate (CBTRIP) sample. Only endosulfan (172.97% RPD) and Total >C10-C40 (66.67% RPD) exceeded the recommended range or 0-50% and were above 10 times the LOR. The variation in the results is likely due to the heterogenous nature of the surface soil.

10.5.1 10.5.2 Statistical Analysis

As all the elevated zinc and copper results exceeding the EIL criteria (may not be relevant with future land use) were located within the existing shed area, no further statistical analysis has been completed, as any remediation would also address the zinc and copper impacted areas.

A review of the results shows that the lead results were generally below the investigation criteria for the potential residential land use, except for the area in and around the combined existing shed and former shed locations. A sample (WR13A) collected within the former cropping area also recorded an elevated lead concentration (694mg/kg). This sampling location was immediately north, and downgradient, of the former shed location and was not typical of the remainder of the results from the former cropping area. If this result

(identified as an outlier in the statistical software) is included in the results for the former cropping area, it skews these statistics especially the standard deviation. Although the 95% UCL (261 mg/kg = <criteria) and the total lead concentration for a sample (694 mg/kg = <250% criteria) comply, the standard deviation is 175 mg/kg which is >50% criteria.

For the purposes of the investigation, the results for WR13A have been included into the statistical analysis for the combined existing shed and former shed investigation area. Adding this lead result to the group of results for the combined existing shed and former shed investigation area, also ensures there are 10 data points, which helps validate the statistical analysis.

To assess the distribution of the total lead concentration results, statistical analysis was completed including:

- Maximum
- Standard deviation
- Mean
- 95% upper confidence level (95% UCL).

Using ProUCL 5.1 statistical software, the following results were calculated:

Table 8 – Statistical Analysis Summary

Parameter			Criteria
	Former cropping area	**Existing and former shed area**	**HIL A (1)**
No. of results (n)	14 (3)	10 (3)	
Maximum	54	3560	750
Mean	20	632	
Standard Deviation	17	1062	150
95% UCL (2)	33	1839	300

(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) 95% upper confidence limit of the arithmetic mean

(3) WR13A removed from former cropping area & included in existing and former shed area

The statistical analysis shows that the results for total lead concentration in the former cropping area comply with the investigation criteria.

The statistical analysis shows that the results for total lead concentration in the existing and former shed location do not comply with the investigation criteria.

10.6 Soil Investigation Conclusions

The Soil and Analysis Quality Plan was implemented, and all BETX and PAH results were below the LOR and, therefore, below the investigation criteria.

There were low concentrations of organochlorine and organophosphorus, including combined Dieldrin + Aldrin and DTT+DDD+DDE, as well as total petroleum hydrocarbons, however all results were below the investigation criteria.

There were also low concentrations in most metals results, however they were consistent with typical background concentrations, and below the investigation criteria.

A result for copper total concentration (CB4A), did slightly exceed the 250% EIL investigation criteria (525 mg/kg) for a single sample

There were also two results from the existing shed location that exceeded the zinc 250% EIL investigation criteria (675 mg/kg).

A single sample collected from the existing shed location (CB3A) exceeded the total lead concentration 250% HIL A investigation criteria (750 mg/kg). Using the Pro UCL statistical software, the calculated 95% UCL, standard deviation, and the maximum result all exceeded the lead total concentration investigation criteria in former shed and the previously demolished shed locations

The rinsate samples (WRRS1 & WRRS2) recorded results that were generally below the LOR, and not indicative of potential cross-contamination. Chromium, copper, and zinc were recorded in very low concentrations, and also not indicative of significant cross-contamination. There were also low concentrations of total petroleum hydrocarbons, however also not indicative of significant cross-contamination and there were no criteria exceedances in the sample results.

The results show that there is some soil lead contamination in the area generally around the former shed (now car accommodation) and former shed (demolished) locations. The lead concentrations in this area exceed the investigation criteria for residential land use. A single sample (WR13A), immediately north and downgradient of the sheds location within the former cropping area, did record an elevated lead result, however this result was below the 250% HIL A investigation criteria for a single sample.

As discussed in section 5 of this report, it is understood fill material was placed near the eastern boundary of the site to assist an adjoining owner in stabilising fill material placed on a steep slope. The exact location of the fill has not been identified.

Access to the assumed location was attempted using hand tools to minimise site disturbance. A site visit by HMC was not able to identify fill material within the densely matted root zone, exposed by the hand clearing operations. Further disturbance of this area is not recommended as this may encourage transport of exposed soil and other material. It is noted that future disturbance of this area would not occur and an objective of the planning proposal is the protection, consolidation, and enhancement of native vegetation within this area.

11 DISCUSSION

The proposed changes in the land use zoning boundaries would result in the central ridge area of the site being zoned for residential development, and the more inaccessible areas closer to the side boundaries being zoned for environmental protection. The *Preliminary Site Investigation* (HMC2021.079.01) identified several areas of concern (AoC) including former cropping areas, existing and former shed locations, and an assumed fill site. Further investigation of these AoC has now been completed.

The results from the soil investigation across the areas on the southern part of the site near the Walmsleys Road frontage, showed the former cropping areas generally to be free of potential contaminants of concern PCoC exceeding the investigation criteria for residential land use. Copper, lead and zinc impacted soil exceeding investigation criteria has been identified in the area in and around the existing and former shed location. The impacted area is small, and would likely only be within the surface soil in the red volcanic soils found on the site.

If future development in this area included residential land use, then remediation would likely be required. The metal impacted soil is located in a small accessible part of the site and there are several remediation options that are not complex and well understood. The final remediation strategy would depend on the proposed land use and soil disturbance and there can be no detail in this early planning stage. The identified soil contamination is not an absolute constraint and is easily managed if required.

There are a number of remediation options on this large rural site including:

- fixing the metal contaminants in the current location and capping with clean fill with a Site management Plan to prevent disturbance or
- Excavating the impacted soil and
    - Re-interring in a location on site with a Site Management Plan to prevent disturbance
    - Removal off-site to an approved landfill facility

It would not appear appropriate to prepare a Remedial Action Plan at early planning approval stage, as these matters would be addressed at the Development Application stage.

12 CONCEPTUAL SITE MODEL

Table 9 – Conceptual Site Model

POTENTIAL SOURCE	PATHWAY	EXPOSURE ROUTE	RECEPTOR	PATHWAY COMPLETE
Lead, zinc and copper-impacted soil in existing shed and former shed (demolished) Locations Potential asbestos containing material	Surface water runoff	Chemical/sediment entering local water ways	Ecological receptors	YES Lead, zinc and lead impacted soil exceeding investigation criteria for potential residential land use within the existing shed and former shed (demolished) locations. If future residential development proposed within the identified area, additional investigation and potential remediation would be required Bonded asbestos containing material may be present in existing structures If identified during preparation of development application, this material would be managed by a Safework NSW licensed contractor prior to any demolition.
	Exposed surface soil	Dermal contact to exposed soil during earthworks, building occupation and recreational use	Site worker, Occupier, Visitor	
	Atmospheric dispersion	Inhalation of soil 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 Detailed Site Investigation conclusions are based on the information described in this report and appendices, and the Preliminary Site Investigation (HMC 2021.079.01) dated July 2021 and should be read in conjunction with the complete reports, including limitations.

A planning proposal (PP20/0003) is proposed for a rural landholding located at Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW. The PSI provided information confirming that historic cropping had previously taken place for areas proposed for future residential development. It also identified an existing farm shed and former farm shed (demolished).

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. Surface samples recorded laboratory results showing all organochlorine and organophosphorus chemicals, together with BETX, TPH and PAH were all below the investigation criteria. Metal results were generally typical of background levels and

below the investigation criteria. A single copper result within the existing shed sampling location exceeded the EIL investigation criteria.

There were numerous exceedances in the lead HIL A investigation criteria and zinc EIL investigation criteria. These results also exceeded the statistical analysis criteria. The high concentrations were generally limited to the around within and immediately surround the existing shed and the previously demolished shed.

If future development in the area in the vicinity of the existing shed and previously demolished shed, included residential land use, then soil remediation would likely be required. The metal impacted soil is located in a small accessible part of the site, and there are several remediation options that are not complex and well understood. The final remediation strategy would depend on the proposed land use, and soil disturbance, and there can be no detail in this early planning stage. The identified soil contamination is not an absolute constraint, and is easily managed, if required.

There are a number of remediation options on this large rural site including:

- fixing the metal contaminants in the current location and capping with clean fill with a Site management Plan to prevent disturbance or
- excavating the impacted soil and
    - re-interring in a location on site with a Site Management Plan to prevent disturbance
    - removal off-site to an approved landfill facility

It would not appear appropriate to prepare a Remedial Action Plan at early planning approval stage, as these matters would be addressed at the Development Application stage.

In relation to potential site contamination associated with former land use, Lot 1 DP 1032820, 1 Walmsleys Road, Bilambil Heights NSW, as shown in Appendix 2 of this report, is considered suitable for the proposed rezoning and future residential land use, subject to:

> 1. further investigation and preparation of a remedial action plan by a suitably qualified consultant, to be undertaken prior to the submission of a development application. The Remedial Action Plan is to address the metal-impacted soil on the southern part of the site, in the vicinity of the existing farm shed and previously demolished farm shed, to the satisfaction of the General Manager of Tweed Shire Council of the contaminated soil.

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 2022.

14 February 2022
Completion Date

Mark Tunks
Principal

16 REFERENCES

Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992

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

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OEH 2011, *Guidelines for Consultants Reporting on Contaminated Sites,* Office of Environment and Heritage, Sydney; available at www.epa.nsw.gov.au/clm/guidelines.htm

Hashimoto T.R & Troedson A.l. 2008 *Tweed Heads 1:100 000 and 1:25 000, Coastal Quaternary Geology Map Series*. Geological Survey of New South Wales, Maitland

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Morand, D.T., Soil Landscapes of the Murwillumbah-Tweed Heads 1:100 000 Sheet, 1996

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 Location Map

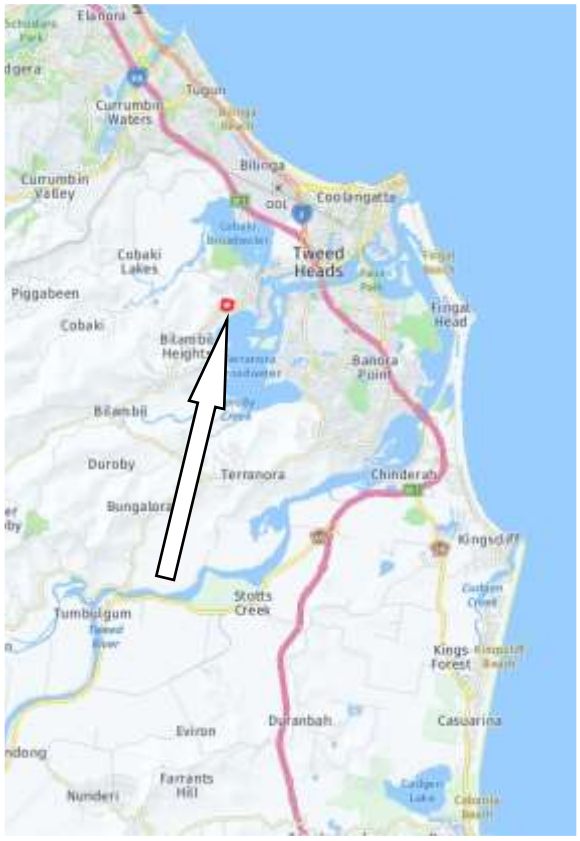

Figure 1 - Surrounding Area (Source: Google Earth 2021)

Appendix 2 Site Boundary

Figure 2 - Site Boundaries (Source: NearMaps)

Appendix 3 Site Plan – Conceptual Master Plan

(Next Page)

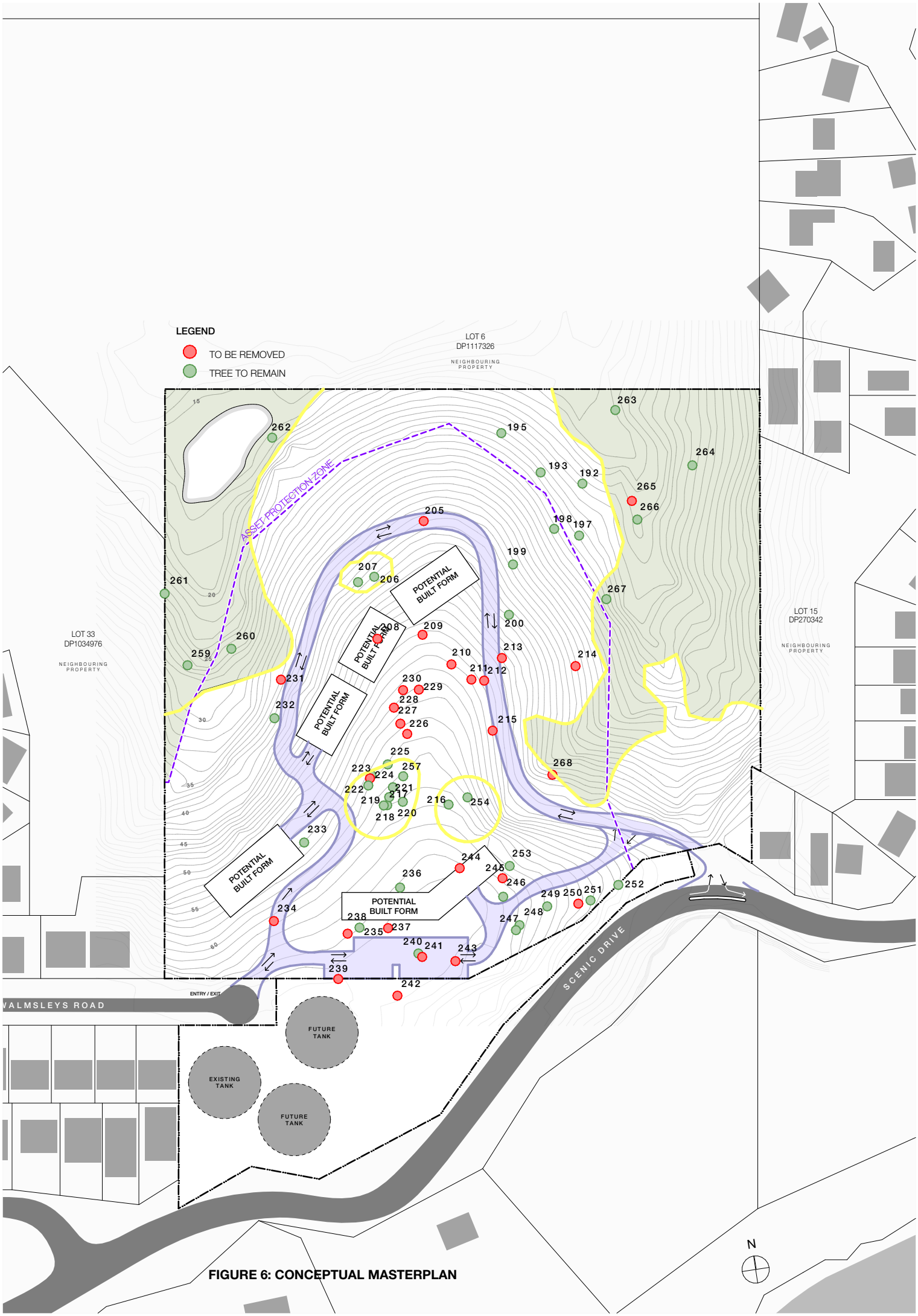

FIGURE 6: CONCEPTUAL MASTERPLAN

Appendix 4 Site Plan – Investigation Area – Sampling Locations

(Next Page)

DETAILED SITE INVESTIGATION SAMPLING LOCATIONS

Property Boundary (Investigation Area)

Historic Cropping Area

HMC Sampling Locations 07_12_2021

Lot 1 DP 1032820
1 Walmsleys Road
Bilambil Heights 2486

JOB: HMC2021.079
DATE: July 2021
VERSION: 01.07.2021

DRAWN: MF
BASE: Near Maps

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

Appendix 5 Geology and Soil Landscape

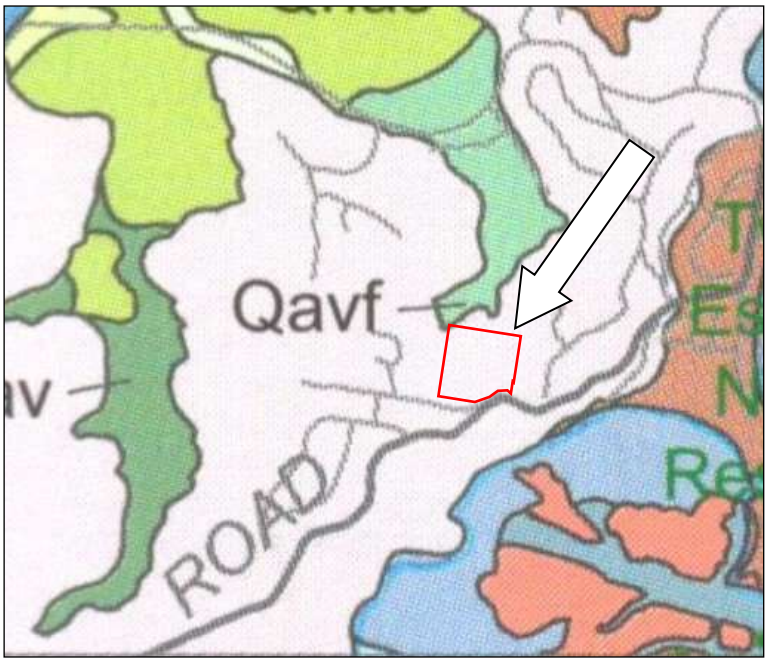

Figure 3 - Geology Map (Source dipnsw.gov.au)

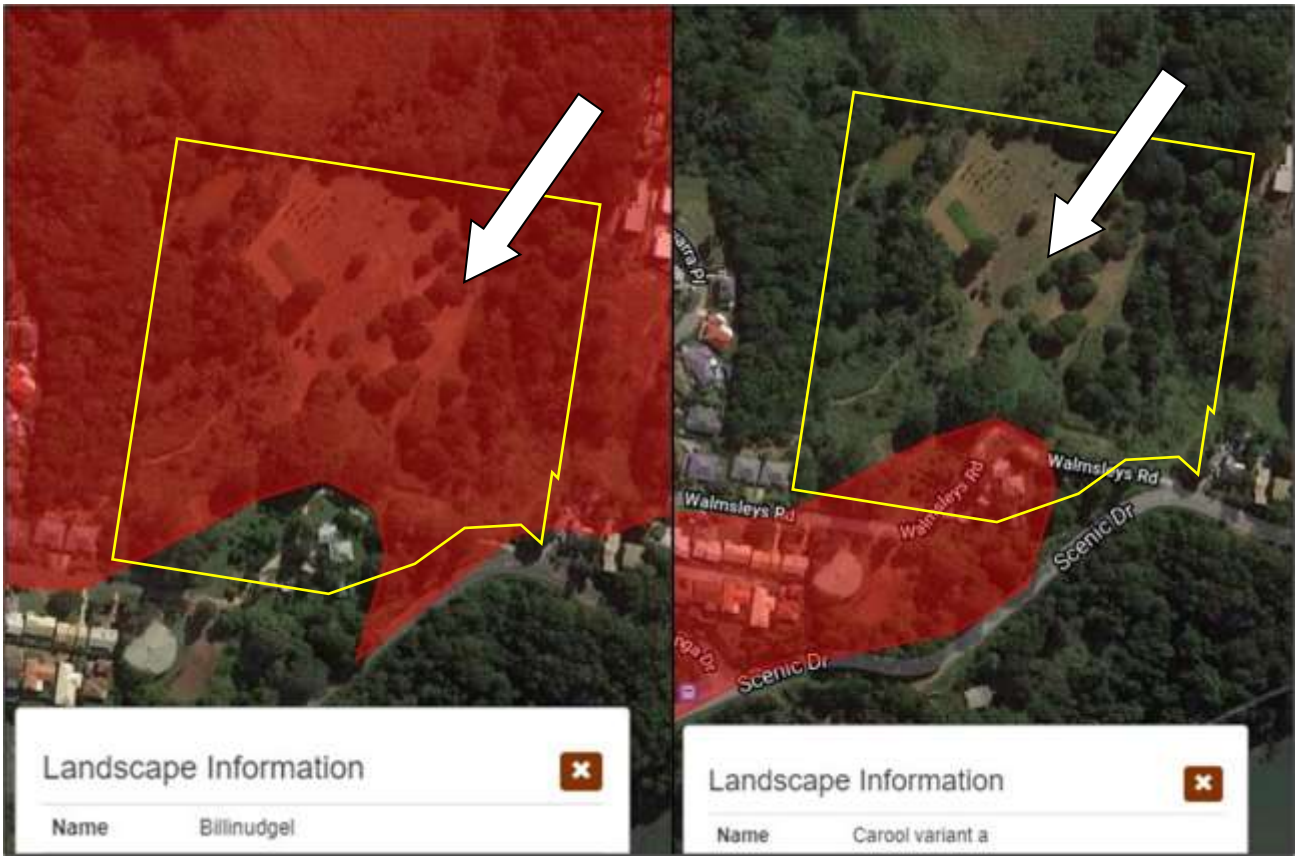

Figure 4 - Soil Landscape (Billinudgel Map (http://www.environment.nsw.gov.au/eSpadeWebApp/)

Appendix 6 Photographic Log

Photo No. 1	**Date** 07/12/2021
Description: View NE overlooking the existing original raised weatherboard dwelling, constructed in 1908.	

Photo No. 2	**Date** 26/04/2021
Description: View S of the existing shed (former dairy bales) located on the southern property boundary. Now only used as a carport/garage.	

Photo No. 3	**Date** 26/04/2021
Description: View SE overlooking the existing detached occupancy to the east of the former dairy bales.	

Photo No. 4	**Date** 26/04/2021
Description: View SW overlooking the site of the previously demolished farm shed, on the southern boundary of the property and the Walmsleys Road frontage.	

Photo No. 5	**Date** 09/12/2021
Description: View SE overlooking the former cropping area to the west of the dwelling, now with mature vegetation and lawn cover.	

Photo No. 6	**Date** 07/12/2021
Description: View S towards the existing structures, overlooking the former cropping area.	

Photo No. 7	**Date** 26/04/2021
Description: View NE across the small abandoned crop of custard apple trees, within the investigation area previously subject to cropping	

Photo No. 8	**Date** 07/12/2021
Description: View N into the steep highly vegetated gully on the eastern property boundary. The illegal fill was previously identified to be located in the gully.	

Photo No. 9	**Date** 11/02/2022
Description: View N into the steep highly vegetated gully on the eastern property boundary, showing path cut to presumed fill location.	

Photo No. 10	**Date** 11/02/2022
Description: Another view further N into the steep highly vegetated gully on the eastern property boundary, showing path cut to presumed fill location.	

Appendix 7 Laboratory Results Summary & RPD

Table 10 - Laboratory Results

	WR1A	WR2A	WR3A	WR4A	WR5A	WR6A	WR7A	WR8A	WR9A	WR10A	WR11A	WR12A	WR13A	WR14A	WR15A	WRDUP	WRTRIP
Metals/Metalloids (mg/kg)																	
Arsenic	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	<5	<5	<5	<5	<5	5
Chromium (total)	11	13	18	22	7	21	28	23	34	19	10	35	38	46	31	34	40
Copper	<5	5	6	7	<5	7	19	23	23	13	26	42	45	24	19	25	28
Nickel	2	2	4	5	<2	4	8	9	12	8	5	14	14	13	15	12	20
Zinc	13	19	22	24	22	41	46	78	132	39	68	58	167	61	45	127	143
Cadmium	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	1	<1	<1	1	<1
Lead	7	6	11	10	7	10	9	44	45	14	54	16	**694**	32	9	42	47
Mercury (inorganic)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<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	<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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
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	<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	<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	<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	<0.05	<0.05	<0.05	<0.05	<0.05

	BS1A	BS2A	BS3A	BS4A	BS5A	CB1A	CB2A	CB3A	CB4A	CBDUP	CBTRIP
Metals/Metalloids (mg/kg)											
Arsenic	<5	<5	10	<5	<5	<5	<5	14	<5	<5	6
Chromium (total)	16	16	19	26	37	35	20	58	27	25	31
Copper	20	26	58	21	29	43	66	**216**	**541**	97	98
Nickel	8	8	16	14	19	15	19	29	10	17	24
Zinc	39	89	218	108	**370**	**1120**	**419**	**3920**	116	**478**	**454**
Cadmium	<1	<1	<1	<1	1	2	<1	8	<1	1	<1
Lead	36	64	**660**	110	**656**	256	223	**3560**	65	**472**	**336**
Mercury (inorganic)	<0.1	<0.1	0.2	<0.1	0.1	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	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin + Aldrin	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	0.12	0.11	1.19	0.10	0.07
DDT+DDD+DDE	0.08	0.16	2.36	<0.05	<0.05	3.19	1.90	0.06	2.97	2.40	1.44
Heptachlor	<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
Endosulfan	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.69	<0.05	<0.05	0.82	<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
BETX											
Benzene (mg/kg)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene (mg/kg)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethyl Benzene (mg/kg)	<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
Total Petroleum Hydrocarbons											
C6-C10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C10-C16	<50	<50	<50	<50	<50	<50	50	<50	<50	70	<50
>C16-C34	<100	<100	180	<100	<100	<100	620	480	200	730	270
>C34-C40	<100	<100	<100	<100	<100	<100	330	240	160	420	230
Total >C10-C40	<50	<50	180	<50	<50	<50	1000	720	360	1220	500
Polynuclear Aromatic Hydrocarbons											
Napthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo-pyrene	<0.5	<0.5	<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5	<0.5

***Investigation criteria exceedances are in bold.**

Table 11 - Relative Percentage Difference (RPD%)

	WR9A	WRDUP	Mean	RPD%	WR9A	WRTRIP	Mean	RPD%
Metals/Metalloids (mg/kg)								
Arsenic	<5	<5	<5	-	<5	5	5	-
Chromium (total)	34	34	34	-	34	40	37	16.22
Copper	23	25	24	8.33	23	28	25.5	19.61
Nickel	12	12	12	-	12	20	16	50
Zinc	132	127	129.5	3.86	132	143	137.5	8
Cadmium	1	1	1	-	1	<1	1	-
Lead	45	42	43.5	6.90	45	47	46	4.34

Mercury (inorganic)	0.1	0.1	0.1	-	0.1	0.1	0.1	-
	CB2A	**CBDUP**	**Mean**	**RPD%**	**CB2A**	**CBTRIP**	**Mean**	**RPD%**
Metals/Metalloids (mg/kg)								
Arsenic	<5	<5	<5	-	<5	6	5.5	18.18
Chromium (total)	20	25	22.5	22.22	20	31	25.5	43.14
Copper	66	97	81.5	38.04	66	98	82	39.02
Nickel	19	17	18	11.11	19	24	21.5	23.26
Zinc	419	478	448.5	13.15	419	454	436.5	8.02
Cadmium	<1	1	1	-	<1	<1	<1	-
Lead	223	472	347.5	71.65	223	336	279.5	40.43
Mercury (inorganic)	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
Organochlorine/Organophosphorus (mg/kg)								
Dieldrin + Aldrin	0.12	0.10	0.11	18.18	0.12	0.07	0.095	52.63
DDT+DDD+DDE	1.90	2.40	2.15	23.26	1.90	1.44	1.67	27.54
Endosulfan	0.69	0.82	0.755	17.22	0.69	<0.05	0.37	172.97
Total Petroleum Hydrocarbons								
C6-C10	<10	<10	<10	-	<10	<10	<10	-
>C10-C16	50	70	60	33.33	50	<50	50	-
>C16-C34	620	730	675	16.30	620	270	445	78.65
>C34-C40	330	420	375	24	330	230	280	35.71
Total >C10-C40	1000	1220	1110	19.82	1000	500	750	66.67

Appendix 8 Chain of Custody

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

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☐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 (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Tweed Heads	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: WALMSLEY ROAD BILAMBIL HEIGHTS PROJECT NO 2021.079	ALS QUOTE NO.:	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: HMC2021.079	COUNTRY OF ORIGIN:	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: MARK TUNKS	CONTACT PH: 0755 368863	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		

COC SEQUENCE NUMBER (Circle)

COC: (1) 2 3 4 5 6 7

OF: 1 2 (3) 4 5 6 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
M TUNKS.			
DATE/TIME: 10·AM 8/12/21.	DATE/TIME: 9/12/21 1130	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	S-12 (OC/OP)	S-2 (METALS)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	WR1A	7/12/2021 0:00	S	ST	1	x	x							
2	WR2A	7/12/2021 0:00	S	ST	1	x	x							
3	WR3A	7/12/2021 0:00	S	ST	1	x	x							
4	WR4A	7/12/2021 0:00	S	ST	1	x	x							
5	WR5A	7/12/2021 0:00	S	ST	1	x	x							
6	WR6A	7/12/2021 0:00	S	ST	1	x	x							
7	WR7A	7/12/2021 0:00	S	ST	1	x	x							
8	WR8A	7/12/2021 0:00	S	ST	1	x	x							
9	WR9A	7/12/2021 0:00	S	ST	1	x	x							
10	WR10A	7/12/2021 0:00	S	ST	1	x	x							
11	WR11A	7/12/2021 0:00	S	ST	1	x	x							
12	WR12A	7/12/2021 0:00	S	ST	1	x	x							
13	WR13A	7/12/2021 0:00	S	ST	1	x	x							
14	WR14A	7/12/2021 0:00	S	ST	1	x	x							
				TOTAL	14	14	14							

Environmental Division
Brisbane
Work Order Reference
EB2135866

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 →

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

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☐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: WALMSLEY ROAD BILAMBIL HEIGHTS **PROJECT NO** 2021.079	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: HMC2021.079	**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:** M. Tunks	**RECEIVED BY:**
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	DATE/TIME: 10am 8/12/21	DATE/TIME: 8/12/21 1130
Email Reports to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au		**RELINQUISHED BY:**	**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au		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	S-12 (OC/OP)	S-2 (METALS)	S-7 (TRH/BTEX/PAH)						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
15	WR15A	7/12/2021 0:00	S	ST	1	x	x							
16	WRDUP	7/12/2021 0:00	S	ST	1	x	x							
17	WRTRIP	7/12/2021 0:00	S	ST	1	x	x							INTERLAB
18	BS1A	7/12/2021 0:00	S	ST	1	x	x	x						
19	BS2A	7/12/2021 0:00	S	ST	1	x	x	x						
20	BS3A	7/12/2021 0:00	S	ST	1	x	x	x						
21	BS4A	7/12/2021 0:00	S	ST	1	x	x	x						
22	BS5A	7/12/2021 0:00	S	ST	1	x	x	x						
23	CB1A	7/12/2021 0:00	S	ST	1	x	x	x						
24	CB2A	7/12/2021 0:00	S	ST	1	x	x	x						
25	CB3A	7/12/2021 0:00	S	ST	1	x	x	x						
26	CB4A	7/12/2021 0:00	S	ST	1	x	x	x						
27	CBDUP	7/12/2021 0:00	S	ST	1	x	x	x						
28	CBTRIP	7/12/2021 0:00	S	ST	1	x	x	x						INTERLAB
				TOTAL	14	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 9130 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 4878 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

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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: WALMSLEY ROAD BILAMBIL HEIGHTS **PROJECT NO** 2021.079	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: HMC2021.079	**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:** M. Tunks.	**RECEIVED BY:** JB
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	DATE/TIME: 10am 8/12/21	DATE/TIME: 9/12/21 1130
Email Reports to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au		**RELINQUISHED BY:**	**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed): admin@hmcenvironment.com.au		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	W-2 (TOTAL METALS)	W-12 (OC/OP)	W-7 (TRH/BTEX/PAH)						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
29	WRRS1	7/12/2021 0:00	W	N,VOA,AG	3	x	x	x						
30	WRRS2	7/12/2021 0:00	W	N,VOA,AG	3	x	x	x						
				TOTAL	6	2	2	2						

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.

Appendix 9 Laboratory Results

See following pages.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2135866**	Page	: 1 of 25
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	: +61 07 5536 8863	Telephone	: +61-7-3243 7222
Project	: 2021.079 - WALMSLEY ROAD BILAMBIL HEIGHTS	Date Samples Received	: 09-Dec-2021 11:30
Order number	: HMC2021.079	Date Analysis Commenced	: 10-Dec-2021
C-O-C number	: ----	Issue Date	: 20-Dec-2021 17:53
Sampler	: MARK TUNKS HMC		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 28		
No. of samples analysed	: 28		

ilac-MRA NATA
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
Morgan Lennox	Senior Organic Chemist	Brisbane Inorganics, Stafford, QLD
Morgan Lennox	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
Thomas Donovan	Senior Organic Chemist - PFAS	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 Contact 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 dimethoate has been raised for sampled 'WRRS1' and 'WRRS2' due to matrix interference.
- EG005T-Total Metals by ICP-AES: Sample EB2135460-015 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WR1A	WR2A	WR3A	WR4A	WR5A
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2135866-001	EB2135866-002	EB2135866-003	EB2135866-004	EB2135866-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**25.5**	**18.4**	**24.4**	**27.0**	**31.2**
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	<1
Chromium	7440-47-3	2	mg/kg	**11**	**13**	**18**	**22**	**7**
Copper	7440-50-8	5	mg/kg	<5	**5**	**6**	**7**	<5
Lead	7439-92-1	5	mg/kg	**7**	**6**	**11**	**10**	**7**
Nickel	7440-02-0	2	mg/kg	**2**	**2**	**4**	**5**	<2
Zinc	7440-66-6	5	mg/kg	**13**	**19**	**22**	**24**	**22**
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	WR1A	WR2A	WR3A	WR4A	WR5A
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		EB2135866-001	EB2135866-002	EB2135866-003	EB2135866-004	EB2135866-005
					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
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**80.2**	**109**	**81.5**	**96.7**	**78.9**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**79.0**	**111**	**82.5**	**99.3**	**81.7**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WR6A	WR7A	WR8A	WR9A	WR10A
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2135866-006	EB2135866-007	EB2135866-008	EB2135866-009	EB2135866-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	35.9	13.1	22.6	31.7	36.5
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	<1
Chromium	7440-47-3	2	mg/kg	21	28	23	34	19
Copper	7440-50-8	5	mg/kg	7	19	23	23	13
Lead	7439-92-1	5	mg/kg	10	9	44	45	14
Nickel	7440-02-0	2	mg/kg	4	8	9	12	8
Zinc	7440-66-6	5	mg/kg	41	46	78	132	39
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	WR6A	WR7A	WR8A	WR9A	WR10A
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		EB2135866-006	EB2135866-007	EB2135866-008	EB2135866-009	EB2135866-010
					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
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**86.7**	**92.4**	**85.9**	**89.8**	**88.7**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**84.6**	**83.8**	**85.8**	**90.8**	**88.1**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WR11A	WR12A	WR13A	WR14A	WR15A
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2135866-011	EB2135866-012	EB2135866-013	EB2135866-014	EB2135866-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**19.4**	**34.3**	**25.8**	**29.1**	**23.5**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**11**	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	**1**	<1	<1
Chromium	7440-47-3	2	mg/kg	**10**	**35**	**38**	**46**	**31**
Copper	7440-50-8	5	mg/kg	**26**	**42**	**45**	**24**	**19**
Lead	7439-92-1	5	mg/kg	**54**	**16**	**694**	**32**	**9**
Nickel	7440-02-0	2	mg/kg	**5**	**14**	**14**	**13**	**15**
Zinc	7440-66-6	5	mg/kg	**68**	**58**	**167**	**61**	**45**
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	WR11A	WR12A	WR13A	WR14A	WR15A
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		EB2135866-011	EB2135866-012	EB2135866-013	EB2135866-014	EB2135866-015
					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	<0.05	<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
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**104**	**77.0**	**93.3**	**89.0**	**87.7**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**101**	**73.3**	**93.1**	**92.8**	**91.3**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WRDUP	BS1A	BS2A	BS3A	BS4A
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2135866-016	EB2135866-017	EB2135866-018	EB2135866-019	EB2135866-020
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**31.3**	**22.0**	**26.8**	**32.3**	**25.2**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	**10**	<5
Cadmium	7440-43-9	1	mg/kg	**1**	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**34**	**16**	**16**	**29**	**26**
Copper	7440-50-8	5	mg/kg	**25**	**20**	**26**	**58**	**21**
Lead	7439-92-1	5	mg/kg	**42**	**36**	**64**	**660**	**110**
Nickel	7440-02-0	2	mg/kg	**12**	**8**	**8**	**16**	**14**
Zinc	7440-66-6	5	mg/kg	**127**	**39**	**89**	**218**	**108**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.1**	<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	<0.05	**0.05**	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	**0.08**	**0.07**	**1.46**	<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	**0.08**	**0.10**	<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	**0.8**	<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	WRDUP	BS1A	BS2A	BS3A	BS4A
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		EB2135866-016	EB2135866-017	EB2135866-018	EB2135866-019	EB2135866-020
					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	**0.08**	**0.15**	**2.36**	<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
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	WRDUP	BS1A	BS2A	BS3A	BS4A
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		EB2135866-016	EB2135866-017	EB2135866-018	EB2135866-019	EB2135866-020
					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		----	<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
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<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
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<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
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		----	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		----	<100	<100	**120**	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	<50	<50	**120**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		----	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		----	<100	<100	**180**	<100
>C34 - C40 Fraction	----	100	mg/kg		----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	<50	<50	**180**	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		----	<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
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WRDUP	BS1A	BS2A	BS3A	BS4A
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2135866-016	EB2135866-017	EB2135866-018	EB2135866-019	EB2135866-020
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	95.0	95.7	82.4	91.7	93.6
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	101	101	84.2	90.2	93.0
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	93.8	79.1	90.6	90.5
2-Chlorophenol-D4	93951-73-6	0.5	%	----	87.0	72.4	83.9	84.9
2.4.6-Tribromophenol	118-79-6	0.5	%	----	78.2	71.8	82.3	85.2
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	83.6	68.1	80.2	78.1
Anthracene-d10	1719-06-8	0.5	%	----	92.6	80.0	91.3	89.1
4-Terphenyl-d14	1718-51-0	0.5	%	----	94.8	80.9	90.5	89.4
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	97.0	120	110	97.9
Toluene-D8	2037-26-5	0.2	%	----	89.9	79.2	82.9	81.3
4-Bromofluorobenzene	460-00-4	0.2	%	----	109	104	103	98.8

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BS5A	CB1A	CB2A	CB3A	CB4A
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2135866-021	EB2135866-022	EB2135866-023	EB2135866-024	EB2135866-025
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	29.5	32.3	15.7	42.3	19.2
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	6	<5	14	<5
Cadmium	7440-43-9	1	mg/kg	1	2	<1	8	<1
Chromium	7440-47-3	2	mg/kg	37	35	20	58	27
Copper	7440-50-8	5	mg/kg	29	43	66	216	541
Lead	7439-92-1	5	mg/kg	656	256	223	3560	65
Nickel	7440-02-0	2	mg/kg	19	15	19	29	10
Zinc	7440-66-6	5	mg/kg	370	1120	419	3920	116
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	0.3	<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	0.12	0.11	1.19
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.16	0.79	0.06	1.86
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	0.50	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.69	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.13	0.11	<0.05	0.21
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	0.19	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	2.9	1.0	<0.2	0.9
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	BS5A	CB1A	CB2A	CB3A	CB4A
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		EB2135866-021	EB2135866-022	EB2135866-023	EB2135866-024	EB2135866-025
					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	**0.12**	**0.11**	**1.19**
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	**3.19**	**1.90**	**0.06**	**2.97**
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		<0.5	<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		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BS5A	CB1A	CB2A	CB3A	CB4A
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		EB2135866-021	EB2135866-022	EB2135866-023	EB2135866-024	EB2135866-025
					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		<0.5	<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		<0.5	<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		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**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	**260**	**230**	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	**470**	**340**	**180**
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	**730**	**570**	**180**
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		<100	<100	**620**	**480**	**200**
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	**330**	**240**	**160**
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	**1000**	**720**	**360**
^ >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	BS5A	CB1A	CB2A	CB3A	CB4A
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00	07-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2135866-021	EB2135866-022	EB2135866-023	EB2135866-024	EB2135866-025
				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	%	86.3	91.8	99.6	90.8	90.4
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	86.2	89.8	96.0	89.9	93.6
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	84.7	85.0	92.6	92.3	88.9
2-Chlorophenol-D4	93951-73-6	0.5	%	77.4	78.6	86.6	85.6	82.2
2.4.6-Tribromophenol	118-79-6	0.5	%	75.5	84.1	92.9	89.7	88.0
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	72.9	80.1	84.1	76.1	75.1
Anthracene-d10	1719-06-8	0.5	%	81.4	92.5	91.6	86.8	84.1
4-Terphenyl-d14	1718-51-0	0.5	%	81.5	93.4	91.8	84.8	83.7
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	96.6	110	110	96.2	92.2
Toluene-D8	2037-26-5	0.2	%	78.2	81.9	74.6	73.0	78.2
4-Bromofluorobenzene	460-00-4	0.2	%	95.4	106	95.7	91.6	93.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CBDUP	----	----	----	----
			Sampling date / time	07-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2135866-026	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**18.8**	----	----	----	----
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	**25**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**97**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**472**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**17**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**478**	----	----	----	----
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	**0.10**	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	**1.05**	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	**0.61**	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	**0.82**	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	**0.35**	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	**0.21**	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	**1.0**	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CBDUP	----	----	----	----
				Sampling date / time	07-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2135866-026	--------	--------	--------	--------
					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		**0.10**	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		**2.40**	----	----	----	----
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	CBDUP	----	----	----	----
				Sampling date / time	07-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2135866-026	--------	--------	--------	--------
					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		**60**	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		**300**	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		**570**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**930**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		**70**	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		**730**	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		**420**	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**1220**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		**70**	----	----	----	----
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	CBDUP	----	----	----	----
			Sampling date / time	07-Dec-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2135866-026	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**94.7**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**88.4**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**90.4**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**85.9**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**93.6**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**78.0**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**87.4**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**85.8**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**96.7**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	**81.8**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**95.6**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	WRRS1	WRRS2	----	----	----
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2135866-027	EB2135866-028	--------	--------	--------
				Result	Result	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.004**	**0.002**	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.082**	**0.086**	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.014**	**0.012**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	----	----	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	----	----	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	----	----	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	----	----	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	----	----	----
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	----	----	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	----	----	----
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L	<2.0	<2.0	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	----	----	----
Methoxychlor	72-43-5	2.0	µg/L	<2.0	<2.0	----	----	----
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	<0.5	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	WRRS1	WRRS2	----	----	----
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2135866-027	EB2135866-028	--------	--------	--------
				Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	<2.0	----	----	----
Dimethoate	60-51-5	0.5	µg/L	<7.9	<11.1	----	----	----
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	<2.0	----	----	----
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	----	----	----
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	----	----	----
Parathion	56-38-2	2.0	µg/L	<2.0	<2.0	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	----	----	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	----	----	----
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	----	----	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	WRRS1	WRRS2	----	----	----
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2135866-027	EB2135866-028	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		40	40	----	----	----
C10 - C14 Fraction	----	50	µg/L		150	210	----	----	----
C15 - C28 Fraction	----	100	µg/L		520	700	----	----	----
C29 - C36 Fraction	----	50	µg/L		140	220	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		810	1130	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		40	40	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		40	40	----	----	----
>C10 - C16 Fraction	----	100	µg/L		190	250	----	----	----
>C16 - C34 Fraction	----	100	µg/L		600	830	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	120	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		790	1200	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		190	250	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		68.4	72.4	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		70.8	77.5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	WRRS1	WRRS2	----	----	----
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2135866-027	EB2135866-028	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		22.7	26.0	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		55.1	62.6	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		65.6	68.2	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		56.8	62.8	----	----	----
Anthracene-d10	1719-06-8	1.0	%		63.4	69.4	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		60.6	63.5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		114	106	----	----	----
Toluene-D8	2037-26-5	2	%		105	99.0	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		118	111	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	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		Recovery Limits (%)	
Compound	CAS Number	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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2145598**	Page	: 1 of 7
Client	: **HMC ENVIRONMENTAL**	Laboratory	: Environmental Division Sydney
Contact	: MARK TUNKS	Contact	: Customer Services ES
Address	: SUITE 29, LEVEL 2 75-77 WHARF STREET TWEED HEADS 2485	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 07 5536 8863	Telephone	: +61-2-8784 8555
Project	: 2021.079 - WALMSLEY ROAD BILAMBIL HEIGHTS	Date Samples Received	: 14-Dec-2021 13:15
Order number	: HMC2021.079	Date Analysis Commenced	: 15-Dec-2021
C-O-C number	: ----	Issue Date	: 21-Dec-2021 13:18
Sampler	: MARK TUNKS		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- 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: Positive results have been confirmed by re-extraction and re-analysis.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WRTRIP	CBTRIP	----	----	----
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2145598-001	ES2145598-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**28.6**	**18.6**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**5**	**6**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**40**	**31**	----	----	----
Copper	7440-50-8	5	mg/kg	**28**	**98**	----	----	----
Lead	7439-92-1	5	mg/kg	**47**	**336**	----	----	----
Nickel	7440-02-0	2	mg/kg	**20**	**24**	----	----	----
Zinc	7440-66-6	5	mg/kg	**143**	**454**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.1**	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	**0.07**	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	**0.82**	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	**0.22**	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	**0.4**	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	WRTRIP	CBTRIP	----	----	----
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2145598-001	ES2145598-002	--------	--------	--------
				Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	**0.07**	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	**1.44**	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<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	WRTRIP	CBTRIP	----	----	----
				Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2145598-001	ES2145598-002	--------	--------	--------
					Result	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		----	**120**	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	**250**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	**370**	----	----	----
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		----	**270**	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	**230**	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	**500**	----	----	----
^ >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	WRTRIP	CBTRIP	----	----	----
			Sampling date / time	07-Dec-2021 00:00	07-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2145598-001	ES2145598-002	--------	--------	--------
				Result	Result	----	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	----	<1	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**111**	**96.0**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**90.3**	**105**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	**86.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	**85.4**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	**80.0**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	**94.8**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	**94.5**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	**87.7**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	**96.8**	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	**106**	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	**90.9**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130