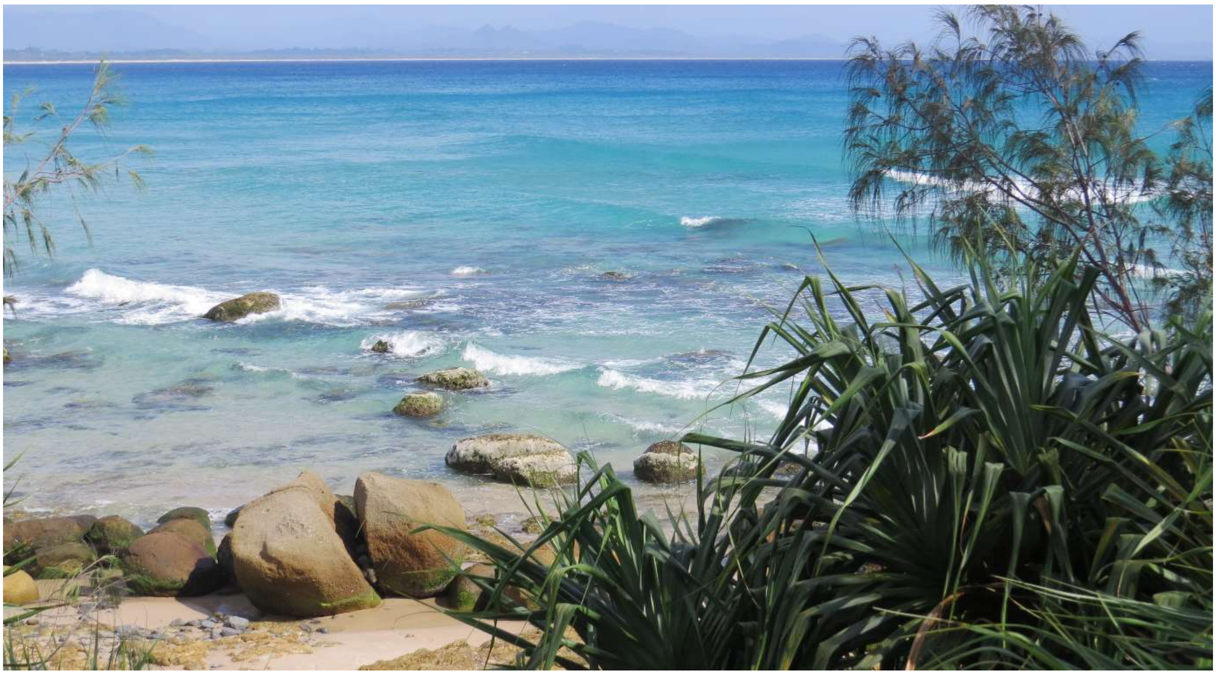
Preliminary Site Investigation

110 – 120 Carrs Drive

Yamba NSW

August 2022, Ref. 21029.2



Easterly Point Environmental

www.easterlypoint.com

Report Details

The following report was commissioned by the Clifton Yamba Land:

Preliminary Site Investigation

110 - 120 Carrs Drive

Yamba NSW 2464

August 2022

This report was prepared in accordance with the scope of work described in Easterly Point Environmental's proposal and the associated contract, for the sole use of Clifton Yamba Land, their agents, and the relevant regulatory authorities, including a contaminated land auditor if applicable. It is subject to the *Limitations to environmental information*, described in Section 1.3 of the report.

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1.0 Introduction

This preliminary site investigation (PSI) was conducted by Easterly Point Environmental for Clifton Yamba Land for a site located at 110 – 120 Carrs Drive, Yamba NSW, identified as Lot 32 DP1280863 and Lot 2 DP733507. The proposed scope of work was detailed in Easterly Point's proposal to Clifton Yamba Land on 17 May 2022, with their acceptance of the engagement confirmed on 23 June 2022.

This report should be read in conjunction with the *Limitations to environmental information* in Section 1.3.

1.1 Background

The site is located at 110 – 120 Carrs Drive, Yamba and consists of approximately 17.6 ha of rural residential land. The site has primarily been used for cattle grazing, with some minor intensive agricultural activities undertaken in the 1960s and 1970s. A site history review and site inspection have identified various structures at the site, including a residential house fronting Carrs Drive, and a series of buildings/sheds in the northern and central portions of the site.

An investigation of the 120 Carrs Drive site was undertaken by Easterly Point in June 2021, and various areas of concern were identified, with recommendations provided for further investigation.

Proposed development

It is understood that the land is proposed to be developed into a manufactured housing estate, with the developable area encompassing approximately 10 ha in the eastern portion of the site. The development is reported to include the importation of material to raise the site elevation by 1.2 – 2.0 m, with the majority of site utility services to be installed within the vertical extents of the imported fill. Localised excavation into natural soils at depths < 5 m Australian height datum (AHD) will be required for some utilities, e.g. sewer rising mains. The western portion of the site is not proposed to be disturbed during development, and is covered by dense vegetation. Diagonally behind the house there is a second order stream, which is to be retained as part of the proposed development.

The proposed development layout (draft concept plan only[1]) is shown in Appendix A.

As part of a pre-development application (DA) lodgement meeting with Clarence Valley Council (CVC), the meeting minutes[2] prepared by CVC included the following requirements, as relevant to this investigation:

- *State Environmental Planning Policy No. 55 – Remediation of Land*: a preliminary site investigation is required to be submitted with the application demonstrating the land is suitable for residential use; and
- Potential soil contamination: Due to the possible previous use of the land for agricultural/horticultural purposes it will need to be demonstrated that the site is suitable for its intended [use]; and
- Acid Sulfate Soils: The subject land is identified as containing Class 2 Acid Sulfate soils on the Acid Sulfate Soils Map and is therefore subject to the provisions of Clause 7.1. An ASS management report must be prepared for the development and submitted with the DA.

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[1] This figure is provided to show the distinction between the developable area in the eastern portion of the site and the non-developable area in the western portion, and does not represent final site configuration.

[2] Clarence Valley Council (30 August 2021) *Pre-DA lodgement Meeting*, (Ref. DMU2021/0032).

1.2 Objectives and scope

As per the Environmental Protection Authority (EPA 2020), the overall objective of a preliminary site assessment is to assess whether contamination has the potential to exist on the site, and whether further investigation is warranted. A further objective of this assessment was to investigate the site's history and areas of concern, as identified in the previous investigation.

In accordance with EPA (2020), the objectives of a site history review are to:
- identify all past and present potentially contaminating activities;
- identify potential contamination types;
- discuss the site condition;
- provide a preliminary assessment of site contamination; and
- assess the need for further investigation/s.

To meet these objectives, the following scope of work was undertaken:

- Revision of site history information and conducting relevant environmental searches, including:
  - information held by CVC NSW in regard to publicly available development applications on the site and immediate surrounding area;
  - aerial photographs review;
  - Before You Dig Australia (BYDA) services search;
  - NSW database search for groundwater works including bores, wells and excavations; and
  - NSW EPA public access databases, including notices under *the Contaminated Land Management (CLM) Act 1997* and the *Environmentally Hazardous Chemicals (EHC) Act 1985*, sites notified to EPA under Section 60 of the CLM Act, and notices and licences under the *Protection of the Environment Operations (POEO) Act 1997*.

- Review of relevant topographic, soils and geological maps and the associated notes.

- Development of investigation design documents, including a preliminary conceptual site model (CSM), data quality objectives (DQOs), and a sampling, analysis, and quality plan (SAQP) based on the site history review.

- Completion of a site inspection and limited subsurface soil sampling program, including the advancement of soil bores across the site and collection of soil samples for analysis at a National Association of Testing Authorities (NATA) accredited laboratory.

This investigation has been conducted in accordance with the following guidance documents, with additional references provided in Section 11.2:

- National Environment Protection Council (NEPC) (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*, Schedule A and Schedules B(1) – B(9), National Environment Protection Council, Canberra.

- EPA (1995) *Contaminated Sites: Sampling Design Guidelines*, (Ref. 95/59), NSW EPA, Sydney.

- EPA (2020) *Consultants reporting on contaminated land, Contaminated land guidelines*, NSW EPA, Sydney NSW.

1.3 Limitations to environmental information

The findings of this reporting are based on the objectives and scope of the services provided. Easterly Point Environmental 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 made.

Easterly Point's review/assessment is strictly limited to identifying the environmental conditions associated with the subject property in regard to site contamination, and does not seek to provide an opinion regarding other aspects of the environment not related to site contamination, or to the suitability of the site in regard to:

- other aspects of the environment not related to site contamination; or
- hazardous building materials in buildings or structures; or
- structures, footings, infrastructure, and the like, whether above or below ground; or
- the suitability of fill materials for any use and any geotechnical considerations; or
- to the suitability of the site in regard to land use planning or legal use of the land; or
- regulatory responsibilities or obligations (for which a legal opinion should be sought); or
- the work health and safety (WHS) legislation; or
- the suitability of any engineering design.

Reviews of such information are only in relation to the contaminated land aspects of any project or site. If specialist technical review of such documents is required, these should be obtained by an appropriate technical or legal specialist.

The reporting and conclusions are based on the information obtained at the time of the assessments. Changes to the subsurface conditions may occur subsequent to the investigation described, through natural processes or through the intentional or accidental addition of contaminants, and these conditions may change with space and time.

Field monitoring, sampling and chemical analysis of environmental media and structures are based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate, based on regulatory requirements, site history, and the proposed land use, not on sampling and analysis of all media, at all locations, for all potential contaminants.

Limited field monitoring, and environmental sampling and laboratory analyses, were undertaken as part of the investigations reviewed or conducted by Easterly Point, as described. Ground conditions, contaminants, and material types/composition can vary between sampling locations, and this should be considered when extrapolating between sampling locations. Except at each sampling location, the nature, extent and concentration of contamination is inferred only.

Furthermore, the test methods used to characterise the contamination at each sampling location are subject to limitations and provide only an approximation of the contaminant concentrations. Monitoring and chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, 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 at the site should not be interpreted as a warranty or guarantee that such materials do not exist at the site. Therefore, future work at the site which involves subsurface excavation or removal of structures or parts thereof, should be conducted based on appropriate management plans. These should include, *inter alia*, environmental management plans, including unexpected findings protocols, hazardous building materials management plans, and work health and safety plans.

If additional certainty is required, then additional site history information should be obtained, or additional exploration and sampling and analysis should be conducted. This decision should be made by the user of this information based on an appropriate risk management process, and the user should commission additional services if required.

2.0 Site identification and surrounds

2.1 Site identification and land use

The site location is shown in Figure 1, attached. The site identification and land use details are:

Street address:	110 and 120 Carrs Drive, Yamba NSW 2464;
Property description:	Lot 32 DP1280863 and Lot 2 DP733507;
Property size:	17.6 ha (approximately), comprising: Lot 32 - 1.5 ha; and Lot 2 - 16.1 ha.
Local government area:	Clarence Valley Council;
Land use – existing:	Vacant;
Land use – proposed:	Residential – manufactured housing estate;
Zoning – existing:	R1: General residential; C3: Environmental management; C2: Environmental management; and
Zoning – proposed:	As above.

The site zoning is shown in Figure 2.1.

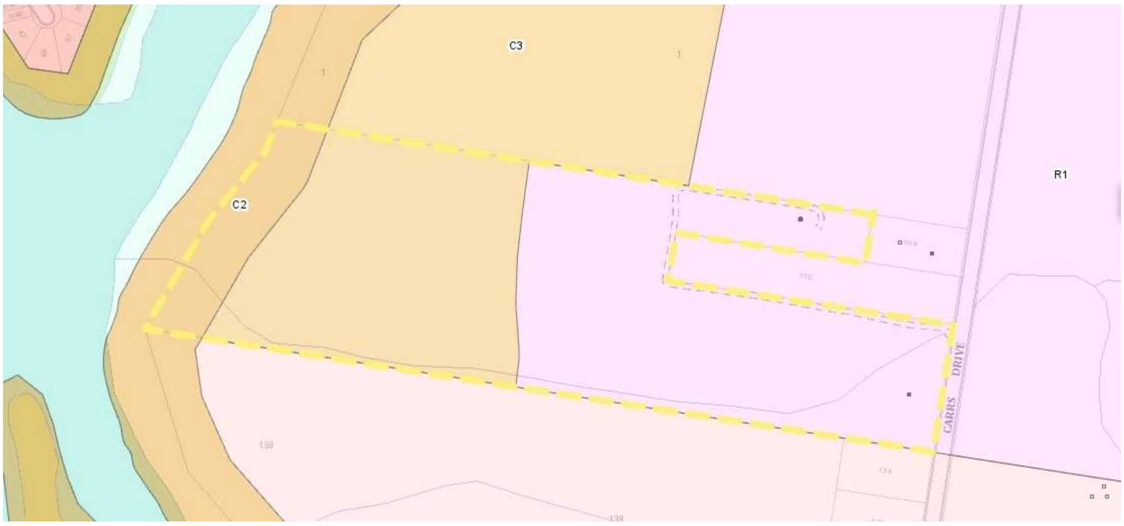

Figure 2.1: Site zoning
Source: ePlanning Spatial Viewer, NSW Government

2.2 Surrounding land use

The site is located in an area of mixed rural residential land use, approximately 3 km west of the town centre of Yamba. The surrounding land uses include:

North:	Rural property, currently being developed into a manufactured housing estate. Followed by rural land use, with St James Catholic Primary school located approximately 350 m to the north-east;
East:	Carrs Drive, with rural properties beyond, primarily grazing land;

South:	Rural residential property used for intensive agriculture (macadamia orchid); and
West:	Oyster Channel followed by both residential and rural properties.

2.3 Surrounding environment

The site is located in a predominantly rural area, with the western boundary of the site adjoining Oyster Channel. A second order stream traverses the site, entering the site from Carrs Drive, crossing the eastern portion of the site and running parallel to the southern site boundary before exiting into Oyster Channel. It does not appear that the stream has been significantly historically re-aligned based on review of historical aerial photographs.

2.3.1 Environmental values

Environmental Values (EVs) have been developed for NSW rivers and estuaries, and provide guideline levels, known as water quality objectives (WQOs), to assist water quality planning and management. They are the agreed environmental values and long-term goals for NSW's surface waters, and set out:

- the community's values and uses for rivers, creeks, estuaries and lakes (i.e. healthy aquatic life, water suitable for recreational activities like swimming and boating, and drinking water); and
- a range of water quality indicators to help assess whether the current condition of our waterways supports those values and uses.

The numerical default criteria or trigger values to support the environmental values established by the WQOs are included in ANZG (2018), ANZECC/ARMCANZ (2000) and NHMRC/NRMMC (2011).

The site is located within the Clarence River Catchment, with the Clarence River mouth located between the towns of Yamba and Iluka. No EVs or WQOs have been derived for the Clarence River Catchment. NSW Department of Planning and Environment, Water in NSW[3], describes that the catchment area covers approximately 22,716 km^2, and describes that key water management issues include:

> *Key issues include riverbank erosion, gully erosion, invasive weeds, fire management practices and acid sulphate soils.*
>
> *Due to a high density of rural settlement, the region's rivers and estuaries tend to be affected by changed run-off conditions caused by land clearing, agricultural use, human settlement and recreation. Many streams on the coastal floodplain have been straightened and channelled and sewage treatment plants discharge high volumes of nutrient rich water into the basin's river systems.*
>
> *Most of the rivers and creeks in the Clarence River basin are unregulated, with no major storages to capture and control flows. Most water users rely on natural flows or small structures, such as weirs, for their water supplies. As in most unregulated rivers, flows are most affected during relatively dry times, when water is low and demand high.*

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[3] https://www.industry.nsw.gov.au/water/basins-catchments/snapshots/clarence#:~:text=The%20Clarence%20River%20catchment%20is,area%20of%2022%2C716%20square%20kilometres.

3.0 Environmental setting

The desktop study of the environment at and around the site is summarised, including published soils and geological information.

3.1 Local meteorology

A summary of the climatic data for the Yamba Pilot Station, located approximately 5 km east of the site, is shown in Table 3.1. Yamba has a temperate climate, with a wet summer season and mild, drier winters. The temperatures are highest between December to March and coldest in the winter months of June to August, with the highest average rainfall occurring between February and May.

Table 3.1: Climatic summary[1]

	Temperature ^{0}C [2]		Rainfall mm [3]		Average number of rain days [4]
	Mean minimum	Mean maximum	Mean monthly	Highest monthly	
January	20.3	26.8	139.5	478.9	12.5
February	20.4	26.8	163.2	612.4	13.8
March	19.3	26.1	191.6	728.8	16
April	16.5	24.3	160.4	629.4	13.5
May	13.3	21.8	153.9	753	12.5
June	10.9	19.7	135.9	548.4	10.7
July	9.8	19.1	100.3	707.5	9.2
August	10.5	20.2	75.2	559.8	8.1
September	13	22.1	58.8	227.3	8.5
October	15.5	23.4	79.6	370.7	9.8
November	17.5	24.7	92.3	330.4	10.3
December	19.2	26	117.7	385.2	11.4

Notes:
1. Data from the Bureau of Meteorology climate averages website for Yamba Pilot Station.
2. Temperature data collected from 1877 to 2022.
3. Rainfall data collected from 1877 to 2022.
4. Number of days in a calendar month with ≥1 mm of precipitation.

It is noted that in the months preceding the investigation, the region received higher-than normal rainfalls, with major flooding seen across the surrounding area. The total monthly rainfall observed at Yamba Pilot Station in February and March 2022 was 549 mm and 717.8 mm, respectively (Bureau of Meteorology climate averages website).

3.2 Topography and hydrology

Based on the 1:25,000 Yamba topographic map, the site is located at approximately 3 m AHD. A topographic low follows the Oyster Channel tributary of the Clarence River, as it runs to the west of the site at 0 m AHD. The topography of the site is consistent with that of the surrounding land, remaining relatively flat throughout the site and town.

The site is predominantly flat and undeveloped with vegetation covering the majority of the site. As such, direct infiltration to the subsurface is expected to be high.

3.3 Geology and soils

3.3.1 Geology

The 1:100,000 *Grafton Area Coastal Quaternary Geology* Map indicates that the site is underlain by both:

- *Qhef* - Holocene tidal-delta flat: marine sand, silt, clay, shell, gravel; and
- *Qpef* - Pleistocene tidal-delta flat: marine sand, silt, minor clay, indurated sand, shell.

An extract of the map is shown below in Figure 3.1.

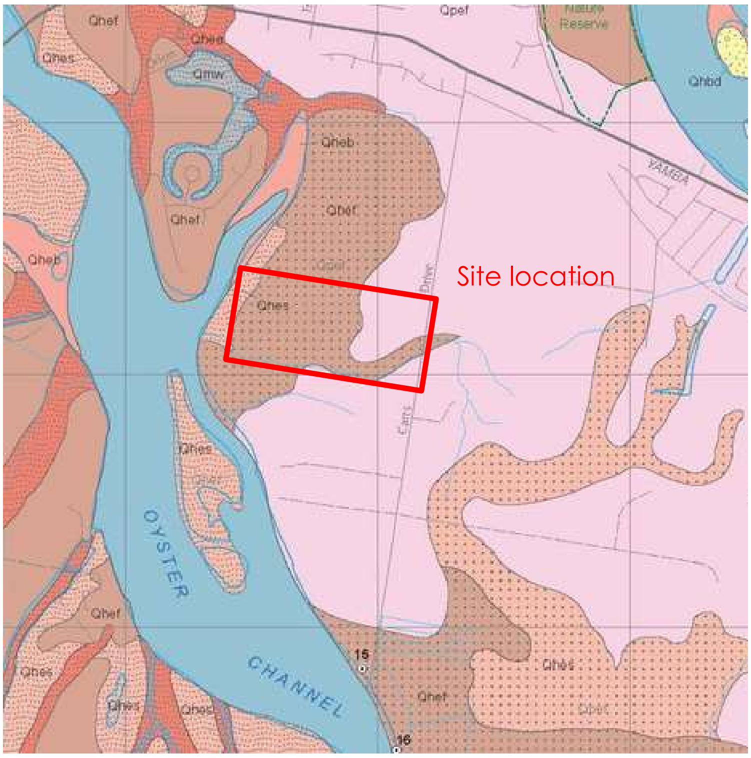


Figure 3.1: Geology sheet for site and surrounds
Grafton Area 1:100,000 Coastal Quaternary Geology Map

According to the Grafton-Maclean 1:250,000 Geological Series Sheet (Geological Survey of NSW 2001), the site is underlain by early Jurassic aged sandstone with clays and ferrunginised fossil wood logs and fragments, Grafton Sandstone (*J-bgs)*. According this mapping, in the area of Yamba, this geological unit is commonly overlain with Qx, Quaternary aged marine, barrier, and estuarine sediments, coastal plain sand deposits, organic swamp deposits, with veneer of *Qa,* Quaternary sand, silt, clay and gravel. See figure 3.2 below for an extract of this map showing site location.

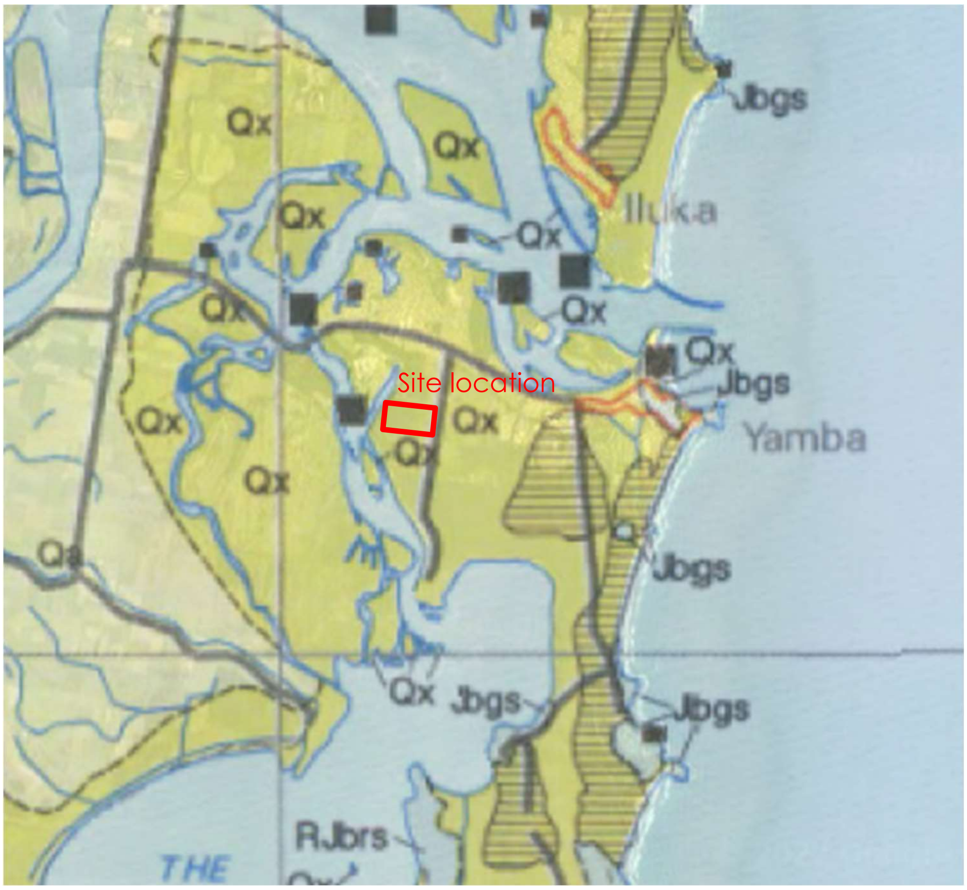


Figure 3.2: Geology sheet for site and surrounds
Grafton-Maclean 1:250,000 Geological Series Sheet

The site is located within the Clarence-Moreton Basin, for which Geoscience Australia describes the following:

> *The Late Triassic to Late Jurassic Clarence-Moreton Basin is situated in southeast Queensland and northeast New South Wales and covers about 26,000 km² onshore and at least 1,000 km² offshore in water depths up to 90 metres. The basin and its precursors, the Esk Trough, Nymboida Basin and Ipswich Basin developed on a basement cut by major long-lived, dextral strike-slip faults (West Ipswich, Coraki and Coast Range Faults). Movement along these produced crustal transtension which was followed in the latest Triassic to Late Jurassic by a period of thermal relaxation and subsidence which formed the Basin.*
>
> *The Basin is subdivided into three main depocentres, the Logan, Laidley and Cecil Plains Sub-basins, with the much smaller Yamba Trough extending offshore from the eastern margin of the Logan Sub-basin. The Logan Sub-basin contains the greatest thickness of sediments with up to 3,000 metres of fluvial and lacustrine siliciclastics and coal with minor basaltic volcanics.*

3.3.2 Soils

The soil landscape at the site is mapped on the Woodburn Sheet at 1:100,000 as *Iluka* (il) (Morand 2001a). This is described as "extremely low, level to gently undulating Quaternary (Holocene and Pleistocene) sand sheets. Low beach ridges are common on Holocene sand. Slopes 0 – 2 %; relief 1 – 3 m; elevation 1 – 5 m. Mix of cleared areas of open-forest and closed forest (littoral rainforest)". The soils are described as:

> *Iluka (il) – deep (>200 cm), well drained Aeric Podosols (Humus Podzols) and deep (>200 cm), poorly drained Aquic/Semiaquic Podosols (Humus Podzols).*

Deep (>200 cm), well-drained Sesquic Aeric Podosols (Podzols) within landscape variant ila.

Qualities and Limitation – acid, highly erodible, non-cohesive, infertile soils with very low available water holding capacity and high permeability.

The soils sheet for the site is shown in Figure 3.3 and a schematic cross -section and summary of the Iluka soil landscape are shown in Figure 3.4, and Table 3.2, respectively.

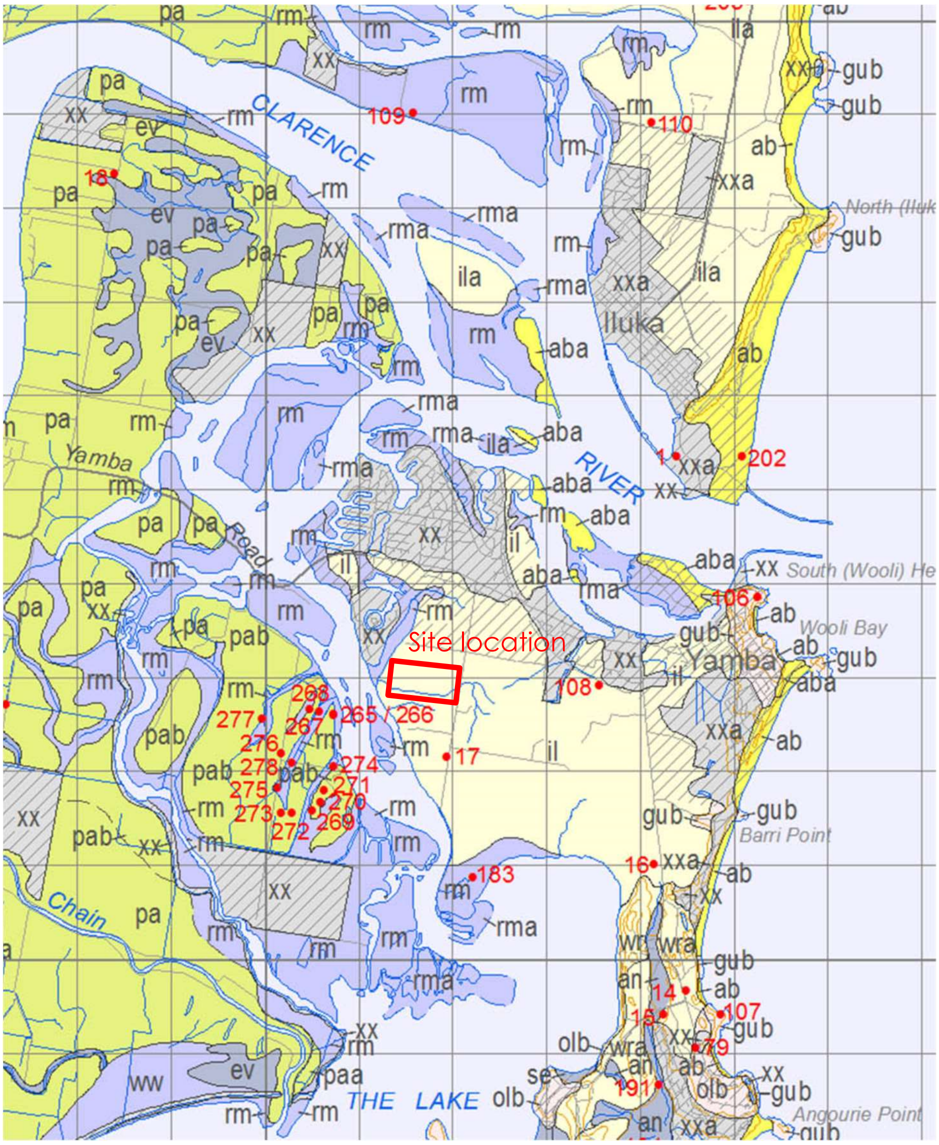
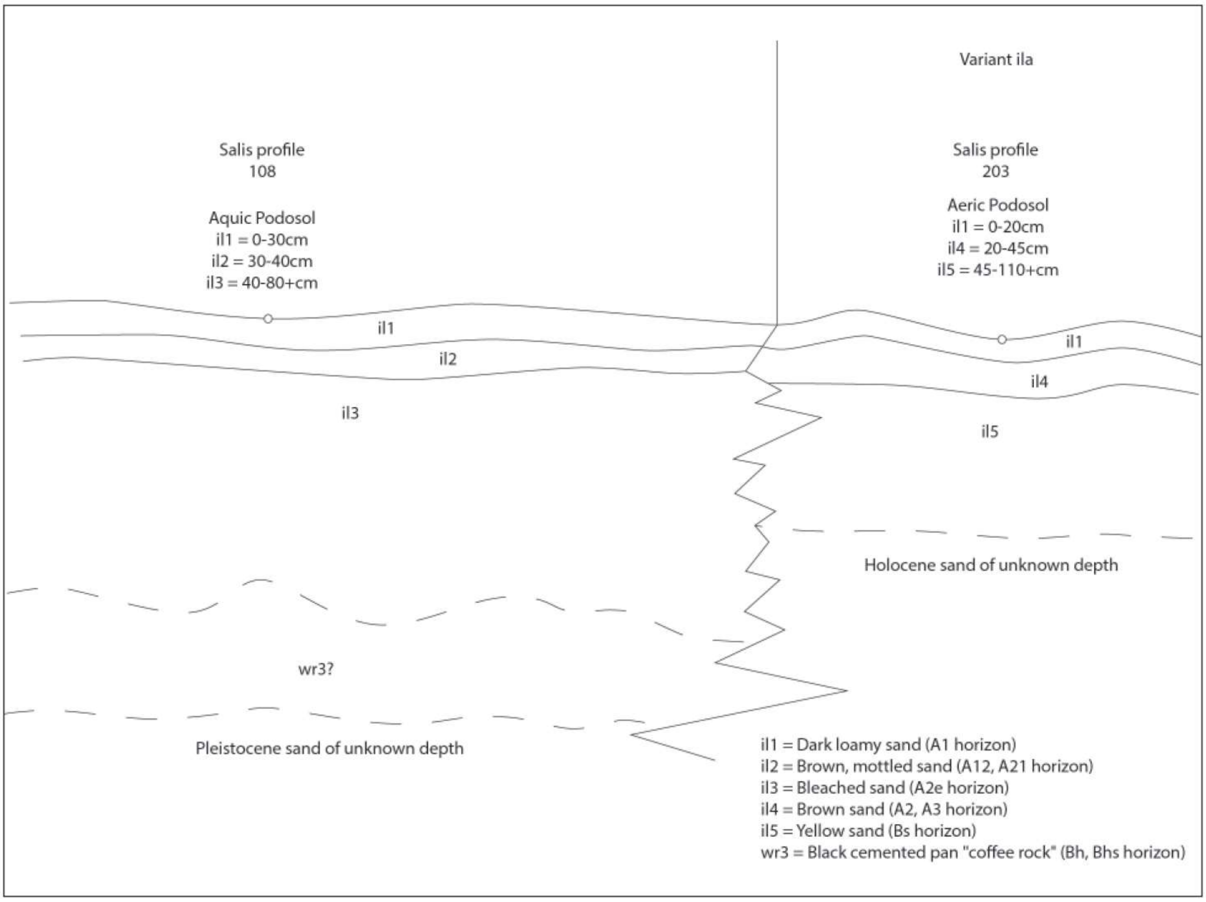


Figure 3.3: Soils sheet for site and surrounds
Woodburn 1:100,000 Soil Landscape Sheet



- *Distribution diagram of Iluka soil landscape illustrating occurrence and relationship of dominant soil materials.*

Figure 3.4: Schematic cross-section of Iluka soil landscape
Morand 2001b

Table 3.2: Iluka (il) soil landscape summary

Dominant soil materials		USCS class	Clay	Silt	Fine sand	Coarse sand	pH	Organic matter %	CEC me/100 g
Il1	Dark loamy sand (0 – 20 cm depth)	SM	11	5	41	43	4.0	3.54	4.7
Il1	Dark loamy sand (20 – 30 cm depth)	SM	11	3	47	39	4.2	1.1	3.8
Il2	Brown mottled sand	SM	5	2	39	54	4.3	0.3	2.3
Il3	Bleached sand	SM	2	0	30	68	4.8	0.08	0.5
Average		-	7.25	2.5	39.25	51	4.33	1.26	2.83

Notes:

- From Morand D.T. (2001b). SALIS profile 108.
- USCS class refers to soil material classifications based on the Unified Soil Classification System. CL = inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays; MH = inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic soils and CH = inorganic clays of high plasticity, fat clays.
- Fine earth particle size analysis of < 2 mm diameter, not including gravel. Clay < 0.002 mm, silt 0.002-0.02 mm, fine sand 0.02-0.2 mm, coarse sand 0.2-2 mm and gravel 2-60 mm.
- pH in pH units. The activity of the negative log of hydrogen ions in a suspension of 1:5 soil: 0.01M $CaCl_2$. 0.75 pH units are added to approximate pH in 1:5 soil:water.
- Organic matter in %. Soil organic matter = organic carbon x 1.755. Organic carbon by Walkey-Black method, which measures the amount of carbon in plant and animal remains including soil humus but not charcoal or coal. 0.5-1.0 very low, 1.0-2.0 low, 2.0-3.0 moderate, 3.0-5.0 high, and >5.0 very high. Used as an indicator of potential contamination retention, i.e. higher organic matter higher contaminant retention potential.
- Cation exchange capacity (CEC) in me/100 g. CEC is an indication of the number of exchange sites within a soil which may temporary hold positively charged ions. It is generally determined by the amount and type of clay and the amount of organic matter. <6 very low, 6-12 low, 12-25 moderate, 25-40 high, and > 40 very high. Used as an indicator of potential contamination retention, i.e. higher CEC higher contaminant retention potential.

3.3.3 Acid sulfate soils

Coastal acid sulfate soils are naturally occurring sediments deposited under estuarine conditions, which contain metal sulfides, formed by bacterial activity in waterlogged conditions when there is little available oxygen. In an undisturbed and waterlogged state, these soils may pose no or low risk (potential acid sulfate soils, PASS). However, when disturbed or exposed to oxygen, acid sulfate soils undergo oxidation, which produces sulfuric acid (acid sulfate soils, ASS). This can lead to soil scalding, death of fish and other aquatic organisms, habitat degradation and corrosion of infrastructure.

The subject land is identified as containing Class 2 Acid Sulfate soils on the Acid Sulfate Soils Map and is subject to the provisions of Clause 7.1. An ASS investigation was conducted by Precise Environmental alongside this PSI, and the site soils found to be PASS. An ASS management plan (ASSMP) has been prepared for the site and should be referred to for detailed information regarding the ASS investigation, classification assessment and management requirements.

3.4 Hydrogeology

A search of licenced groundwater bores within an approximate 1 km radius of the site showed four groundwater bores, wells and/or excavations, which are summarised in Table 3.3 and shown in Figure 3.5. Lithology details were only provided for one of the wells, GW306249, describing sand, medium – coarse from 0 to 8 m depth.

Wells are located outside of the 1 km radius described similar lithology, generally as comprising sand (generally to 8 m) with some locations showing silty clay to 4 m depth. All wells were listed as water supply/monitoring.

There is no known potable use of groundwater in the area, noting that NSW Health recommends groundwater is not used for drinking, cooking and personal hygiene (including cleaning teeth and bathing) without testing and appropriate treatment including disinfection (NSW Health 2019).

Table 3.3: Groundwater information from licence bores[1]

Well No.	Purpose	Installation date	Depth of bore (m)
GW306066	Water Supply	31/12/2000	5
GW306249	Water Supply	10/08/2007	8
GW303904	Water Supply	02/01/2003	5
GW305516	Water Supply	06/11/2002	6.5

Table notes:
1.Data collated from BOM (2022).

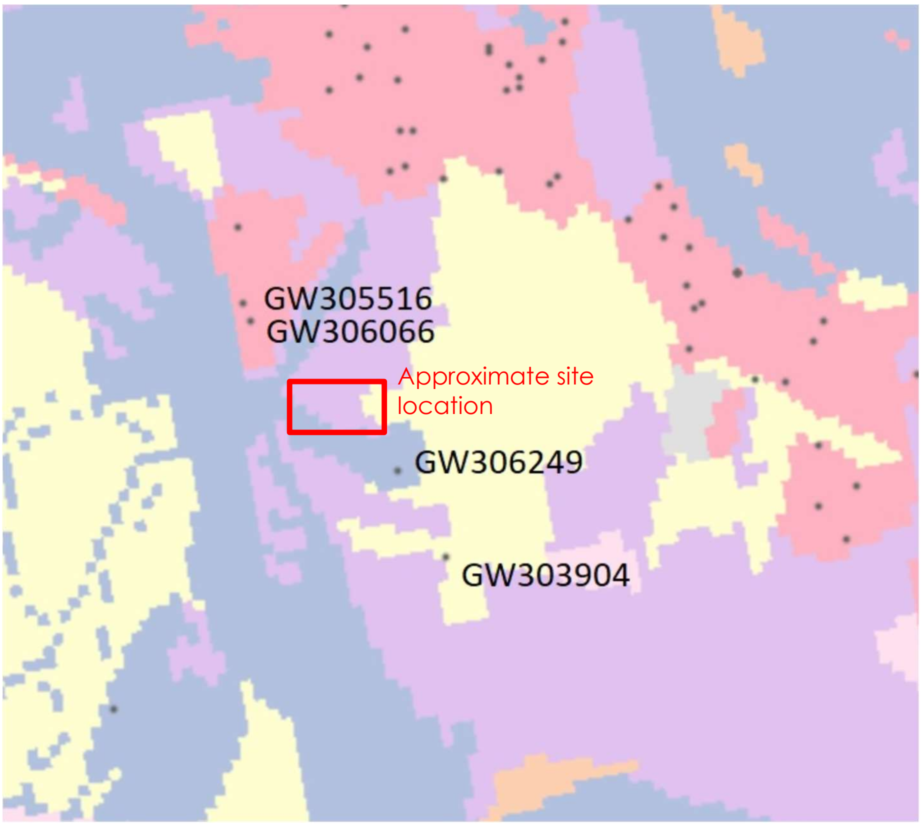


Figure 3.5: Bore hole locations within a 1 km radius of the site

4.0 Site history

The site history information summarised below is based on information obtained from Easterly Point (2021), and the referenced published sources.

4.1 Site history summary

The site appears to have primarily been used for grazing land, with some small areas of intensive agricultural use, e.g. cropping. A number of structures are/have been constructed at the site, including:

- a residential house at 120 Carrs Drive, built between 1980 and 2004;
- a bare-earth floor shed located near the residential dwelling, denoted 'Shed 1', constructed between 1993 – 2004;
- various structures located in the central portion of the site, denoted 'Shed 2', constructed between 2004 – 2011;
- a former residential dwelling located in the northern portion 120 Carrs Drive, constructed pre-1980 which burnt down circa. 2010 - 2015, with only concrete slabs remaining; and
- a number of other current and former structures/sheds, located in the area of the former residential dwelling in the northern portion of the site.

4.2 Land use information

4.2.1 Council records

A search of council records relating to development applications, was conducted on 7 July 2022. The search identified various DAs for the surrounding land, including a multi-dwelling development, seniors living units and various subdivisions.

The subdivision of Lot 3 DP733507 to create Lot 31 on DP1280863 (104 Carrs Drive) and Lot 32 on DP1280863 (110 Carrs Drive), was approved on 30 October 2020.

4.2.2 Aerial photograph review

Eleven aerial photographs were available from 1942 – 2020, including at least one per decade. The aerial photographs are shown in Appendix B. The following information was determined from interpretation of the aerial photographs:

Table 4.1: Aerial photograph summary review

Photograph	Description
1942 (black and white)	The site was predominantly cleared, with the surface cover comprising of grass. The stream can be seen traversing the eastern portion of the site and appears to be flowing over a wider area before running parallel to the southern site boundary and joining Oyster Channel. Some sparse vegetation is visible along the stream-line. It appears that the eastern portion of 110 Carrs Drive is being used for cropping, which extends onto to the land to the north. There are no buildings visible on-site. The surrounding land appears similar to that on-site, with primarily cleared land and some areas of intensive agricultural use, e.g. cropping.
1958 (black and white)	The eastern half of the site remains cleared. However, the western portion of the site is moderately vegetated. There are no buildings visible on-site.

Photograph	Description
1958 cont'd	A few small residential dwellings have been constructed in the areas surrounding the site.
1967 (black and white)	Vegetation has increased across the eastern portion of the site, with the western portion now densely vegetated. Trees are visible across what was possibly an area of cropping, suggesting this use is no longer occurring. A residential building has been constructed approximately 150 m south of the site, with its driveway onto Carrs Drive. An area approximately 250 m north of the site is densely vegetated.
1971 (black and white)	The entire site has been cleared, with some scattered trees remaining across the site and along the banks of the stream. Windrows of what is assumed to be vegetation are visible on the western portion of the site, with some minimal windrows on the eastern portion. A small fenced off area is visible in the south-eastern corner of the site along the boundary. The surrounding area appears largely unchanged from the previous aerial photograph. Areas of cropping are visible on the land to the immediate south and north.
1980 (black and white)	A number of structures are visible in the northern portion of the site, with a driveway from 104 Carrs Drive. The western portion of the site is moderately vegetated. The surrounding area appears largely unchanged from the previous aerial photograph.
1993 (colour)	The residential dwelling of 120 Carrs Drive has been constructed. There are small structures visible to the north and south of the dwelling, within the residential 'yard'. The structures in the northern portion of the site are still visible. Three small areas of disturbance/fill are visible, two in the cleared area in the eastern portion, and one within the western dense vegetation. It is not clear what these represent. The land to the immediate north (eastern portion) is either used for cropping (larger crops size) or windrows of vegetation. The area immediately to the south of the site has been cleared, with the appearance of a residential dwelling and a small dam beyond. The area beyond Oyster Channel has been developed, with the construction of a road and a water diversion channel, marking the beginning of a large housing development.
2004 (colour)	The eastern portion of the site is primarily cleared while the western portion is covered in dense vegetation. What appears to be a large shed is visible approximately 50 m south-west of the residential dwelling. Another residential dwelling is visible in the northern portion of the site, in the area of the previously observed structures. It is unclear if the previous buildings have been renovated or if this is a new structure. The driveway is now via 120 Carrs Drive. A line of disturbance, possibly an access-track, is visible in the centre of the eastern portion of the site.

Photograph	Description
2004 cont'd	A residential dwelling and large shed were constructed on the neighbouring property located at 104 Carrs Drive. The housing development to the north of Oyster Channel appears completed. Residential properties and the school buildings area visible to the north of the site.
2011 (colour)	The site remains largely unchanged, except for the presence of a small structure/shed in the central portion, including a smaller structure to the immediate south. Access roads/tracks are visible across the site. In the northern portion of 120 Carrs Drive, the residential dwelling is visible, and what is assumed to be the carport, greenhouse, and a small shed (to the south-east). The area surrounding the site appears largely unchanged, except for a few additional residential buildings. The land to the immediate south is disturbed with what appears to be an industrial-looking construction.
2012 (colour) SIX maps	The stream can be seen traversing the eastern corner of the site, with vegetation along the banks. The residential dwelling fronting Carrs Drive is clearly visible. The area from the stream to Carrs Drive is primarily cleared and grassed with the exception of vegetation in the southern corner, where a structure can be seen amongst the trees. The residential house in the northern area of the site is visible, including what appears to be the main house, with two smaller structures visible adjoining the house as observed in the 2011 photograph, as well as a car parked in the driveway. A small structure/disturbed area is visible to the south-west of the house, although features cannot be discerned. The structure in the central portion of the site is clearly visible (Shed 2). A fenced area is observed to the north-west of the structure, estimated to be approximately 40 m x 20 m, surrounding a large tree. A small area of disturbed ground is visible within the fenced off area. Disturbance within 110 Carrs Drive is evident along the eastern, southern and western boundaries. The disturbance along the southern boundary appears to be a dirt road, with what may be stockpiles along the western boundary fenceline.
2015 (colour)	The site remains largely unchanged, except that the residential dwelling in the northern portion of the site is no longer present, with what appears to be only a concrete slab remaining. The small structure in the central portion of the site is visible, and vegetation appears to be growing along/forming fence lines, with vegetation generally increasing across the eastern portion. The shed near residential dwelling fronting Carrs Drive is no longer visible, although may be hidden by the dense vegetation (trees). The surrounding area appears largely unchanged.

Photograph	Description
2020 (colour)	All areas of the site are densely vegetated except for the immediate 'yard' area of the residential dwelling of 120 Carrs Drive. The structure (Shed 2) in the central portion is barely visible due to vegetation. In the northern portion of the site a small structure with a green roof is visible, possibly the carport. The 110 Carrs Drive area is primarily cleared, with approximately 35 small white structures visible. There appears to be large development work occurring approximately 200 m to the north of the site. There is cropping and agricultural activity visible on the land to the immediate south of the site.

Based on review of the aerial photographs, the western portion of the site was cleared pre-1942, before being progressively covered in vegetation up until 1971, when the area was completely cleared. There is no evidence from the aerial photographs to suggest that the western portion of the site has been used for any intensive agricultural uses.

It appears that the site has primarily been used for rural land use, with some intensive agricultural activities undertaken in the north-eastern portion of the site up until the 1950s. A residential house was built between 1980 and 1993, with a small driveway fronting Carrs Drive, and a number of sheds/structures/dwellings appear to have been constructed in two separate areas, visible from 1980 onwards.

No evidence of significant and widespread filling was observed from the aerial photograph review.

4.3 Activities conducted

Based on information known to date, it appears that the site has primarily been used for both rural and residential land use, with some intensive agricultural activities historically undertaken in a limited area of the site. A residential house is present on the site, with an associated shed as well as a number of current and former sheds/structures/dwellings. It is assumed that general farming activities would have occurred, e.g. property and machinery maintenance, and some potential uncontrolled filling/dumping may also have occurred at the site.

4.3.1 Chemical usage and storage

It is assumed that general farming and household chemicals, including fuels, oils and pesticides/herbicides have been used and stored at the site, although specific uses and activities are not known. Building products and paints are also known to be potential sources of contamination, especially asbestos and lead:

- Asbestos or asbestos containing materials (ACMs) were commonly used in roofing and gutters, gables and eaves, walls, vinyl, carpet and tile underlay, lining behind wall tiles, imitation brick cladding, fencing, sheds, splashbacks in wet areas, etc. While Australia phased out the use of asbestos from the 1980s and banned it's use, sale or import in 2003, many homes and buildings built or renovated before 1990 still contain asbestos[4].

- It is estimated that all houses built prior to the mid-1970s contain lead-based paint, and homes built up to the 1940s are considered to be especially hazardous because there was so much lead used in paints at that time. Houses built after the mid-1970s can still be

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[4] https://www.asbestos.nsw.gov.au/safety/safety-in-the-home/when-was-asbestos-banned-in-australia#:~:text=Australia%20phased%20out%20the%20use,before%201990%20still%20contain%20asbestos.

a risk if old house paint or industrial or marine paint has been used[5]. The Department of Agriculture, Water and Environment[6] describes that the amount of lead in domestic paint before 1965 was 50%, and then 1% up until 1992, 0.25% up until 1997, and from 1997 onwards 0.1%.

In relation the areas of intensive agriculture, i.e. cropping, NSW EPA[7] describes that:

> *small-cropping, local orchards and market gardens are all significant consumers of pesticides and farm chemicals. There are generally fringes of small plantations, orchards and market gardens around all towns and cities. These areas are eventually overtaken by urban growth. Their potential for adverse health and environmental effects should not be ignored*

Given the period of the cropping activities, it is possible that inorganic pesticides may have been used, primarily arsenic, which, in NSW, was used up until 1950s and 1960s before being replaced by organochlorine pesticides (OCPs).

It is highlighted that a request for a *Site search for Schedule 11 Hazardous Chemicals on Premises* via SafeWork NSW was not completed as part of this investigation. This search relates to the storage of hazardous chemicals, where if you store, handle or process Schedule 11 hazardous chemicals (previously known as dangerous goods) that exceed the quantities specified (manifested quantities) in the *Work Health and Safety Regulation 2017*, then you must notify SafeWork NSW. For example, for Flammable Liquids 3, e.g. petrol, the manifest quantity is 10,000 L. Given the site use, it is unlikely that bulk chemicals were stored on the site above the specific volumes for notification, and/or notification/updates provided to SafeWork.

A cattle tick dip is understood to be located approximately 350 m from the site, however given the nature of contaminants at these dips, and the distance to the site, impacts from the dip are not expected at the site.

4.3.2 Incidents and spills

A house fire is known to have occurred in the northern portion of the site, with the residential dwelling being completely destroyed by the fire. Media reports indicate that the fire occurred in May 2013[8].

No other records relating to incidents or chemical spills were sighted or reported to Easterly Point.

Observations of spills and leaks were observed by Easterly Point (2021) in and around the residential property and shed on 120 Carrs Drive, which were again observed during this investigation. Further information is provided in Section 4.3.3 and 5.1.

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[5] SA Health, Lead-based paint Fact Sheet https://www.sahealth.sa.gov.au/wps/wcm/connect/d43c4d8048f12740888aef0e3d7ae4ad/Fact%2BSheet%2B%2BLeadbased%2Bpaint+UPDATED+011021.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-d43c4d8048f12740888aef0e3d7ae4ad-nMWc-OK) .

[6] Department of Agriculture, Water and Environment, *Lead in house paint*. Australian Government. Accessed 05/04/20. https://www.environment.gov.au/protection/chemicals-management/lead/lead-in-house-paint

[7] https://www.epa.nsw.gov.au/licensing-and-regulation/authorised-officers-and-enforcement-officers/resources-and-training/contaminated-agricultural-land

[8] https://www.dailytelegraph.com.au/news/nsw/grafton/person-dies-in-fatal-house-fire-yamba/news-story/f9413cf91a555ec31a3c2fb1e3e4644e

4.3.3 Waste management

No records or specific information relating to waste management was sighted or obtained by Easterly Point. The information below is based on site inspections and intrusive investigations conducted by Easterly Point in June 2021 and July 2022, and anecdotal information obtained during those inspections:

- There were various stockpiles of waste around the 120 Carrs Drive residential property, including a stockpile of timber and general rubbish surrounding the building. A large make-shift fire-pit was also located to the west of house, with bottles and cans evident in the waste.

- An oil drum was observed to be located on top of a what appeared to be a metal tractor attachment, near the old shed with visible oil staining across the metal structure and ground below.

- A large open shed near the residential house of 120 Carrs Drive (denoted 'Shed 1') was observed to contain various items and rubbish, including batteries, old tools, golf clubs, general house-hold 'hard-rubbish', etc. scattered across the area.

- A large amount of waste was observed in the area of the residential dwelling in the northern portion of 120 Carrs Drive, mixed amongst the various sheds and structures. Waste included an abandoned car, plastic and metal petrol and oil drums, house-hold 'hard-rubbish', timber, corrugated iron, a hot-water service, crab pot, plastic sheeting, etc.

- While waste was observed along the southern fence line of 110 Carrs Drive in June 2021, including an old mattress and building waste, this material was no longer visible in July 2022. A stockpile of corrugated iron sheeting and timber was observed along the northern fence line in July 2022.

The residential dwelling fronting 120 Carrs Drive is connected to a septic tank. Waste-water management of the other dwellings is unknown.

4.3.4 Filling

No specific information was identified by Easterly Point during the site history search regarding filling at the site. Based on relatively consistent site levels with the surrounding land, it is assumed that no major filling has occurred.

Notwithstanding the above, filling was used as road base to form a driveway along the southern boundary of 110 Carrs Drive. Further information is provided in Section 4.7 and 8. It is also possible that fill was used under the concrete slabs of the residential dwellings.

4.4 Services

A services search was conducted through Before You Dig Australia on 6 July 2022, which showed the site is connected to Essential Energy electricity and Telstra networks.

The Essential Energy electricity plan showed there are 'underground earth or wires' along Carrs Drive, but no underground cables or critical assets were located on or adjacent to the site. There were also above-ground power poles along Carrs Drive and along the northern boundary of 120 Carrs Drive. Telstra lines and pits are present along Carrs Drive, entering the site at the residential property at 120 Carrs Drive, and at the northern boundary of 104 Carrs Drive.

A service locator was engaged to inspect the site on 12 July 2022, prior to the field investigation. The inspection identified that the residential house at 120 Carrs Drive was connected to a septic tank, located to the immediate south of the house, and phone/internet lines running directly from the house to Carrs Drive. Electricity was connected via overhead lines and water pipes could not be located. No underground services could be located in the areas of the central and northern structures, and it was assumed that all services, if they existed, were disconnected.

The Before You Dig Australia plans are provided in Appendix B.

4.5 Licences, permits and notices

Table 4.2 outlines a list of online data bases pertaining to licences, permits and notices for the site, which were reviewed in July 2022.

Table 4.2: Database searches for contaminated land

Data base	Use of data base	Result
NSW EPA Contaminated Land Record	The register lists sites that present a significant risk of harm to human health and/or the environment under the CLM Act 1997. The register shows all current and former remediation orders issued on sites in NSW.	The site, nor any sites in Yamba, are listed on the contaminated land register.
NSW EPA List of Contaminated Sites	The register lists contaminated sites in NSW that have been notified to the EPA under the duty to report obligations under the CLM Act. Sites appearing on this list indicate the contamination may or may not be significant enough to warrant further investigation, remediation or regulatory intervention by EPA.	The site was not listed on the register. It is noted that the EPA was notified about a former service station located approximately 2 km to north of the site, however, EPA decided that regulation under the CLM Act is not required.
Licensed Activities under the POEO Act	Current and former licensed activities under the POEO Act.	There are no current licences that exist for the site under the POEO Act.
EPA and Defence PFAS Investigation Programs	Sites that are part of the EPA PFAS investigation program and sites that are being investigated by the Department of Defence for PFAS.	There are no records for the site and surrounding area within 500 m.
NSW Heritage Database	The State Heritage Register is a list of places and objects of particular importance to the people of NSW. To be listed, an item must be significant for the whole of NSW.	The site is not listed on the NSW Heritage Database.
NSW Department of Primary Industries register for cattle dip sites.	The register lists the known cattle dip sites in the Northern Rivers Region that the NSW Government was involved with.	The site was not identified on the register. Approximately 350 m north of the site, a dip site, known as Yamba, was recorded to be in use from 1939. The dip is recorded as being decommissioned and capped.

4.6 Previous investigations

The following report was available for review:

- Easterly Point Environmental (14 July 2021) *Due diligence environmental site assessment, 120 Carrs Drive, Yamba NSW*, (Ref. 21029L01-080721).

4.6.1 Easterly Point 2021

The objectives of this due diligence investigation were to:
- assess whether contamination had the potential to exist on-site and whether further investigation was needed; and
- to collect sufficient information to provide the client with an appreciation of the contamination status of the site prior to purchasing the land.

This investigation was limited to 120 Carrs Drive, and following scope of work was undertaken:
- limited site history review;
- development of investigation design documents, including a preliminary CSM, DQOs and SAQP;
- completion of a site inspection and limited intrusive soil investigation within targeted areas; and
- analysis of 10 samples at the laboratory for potential contaminants of concern (PCoCs).

The site history review and site inspection identified the site has primarily been used for rural residential land use, with a number of structures identified across the site. It is highlighted that a large portion of the site was inaccessible due to access restraints associated with overgrown vegetation, and the soil investigation was limited to three areas of the site; in the areas of current and/or former buildings.

Eight sample locations were investigated, with all PCoCs either non detect or below the adopted criteria, with the exception of two locations where elevated hydrocarbons were detected. Based on the results of the investigation, the following recommendations were made:
- further investigation of Shed 1 based on the observed material stored within the shed, the bare earth floor and the elevated concentrations of total recoverable hydrocarbons (TRHs) detected in the area;
- further investigation into the source, nature and extent of the elevated TRHs detected near Shed 2; and
- investigation into potential impacts in the area of the former dwelling in the north of the site, in particular for asbestos, given the age of the building and extensive fire that resulted in the building being burnt down.

The Easterly Point 2021 sampling locations are shown in Appendix B.

4.7 Anecdotal information

The following information is based on anecdotal information provided by Ron, the owner of the neighbouring property, located at 104 Carrs Drive, during both the 2021 and 2022 investigations:

- A residential dwelling was previously located on the northern portion of 120 Carrs Drive, on the concrete slab that still remains, however, the dwelling burnt down approximately 5 – 10 years ago. The rubble and associated waste was disposed of off-site.

- A stockpile was present on the site before the residential dwelling in the northern portion of 120 Carrs Drive was erected. The stockpile was reported to contain building materials such as corrugated iron sheets and timber. It is unknown whether asbestos containing materials (ACM) were present.

- The eastern portion of the site had been used for livestock grazing.

- Large slabs of concrete were dumped on the 120 Carrs Drive site, near the north-eastern boundary, from the redevelopment of the Bowls Club.

- Ron had sourced imported roadbase to form a road along the southern boundary of 110 Carrs Drive, with the edges battered off.

5.0 Site features and condition

The site condition described below is based on inspections conducted as part of this investigation. It is highlighted that the site inspection did not constitute an environmental site audit or hazardous materials survey.

5.1 Site condition

A site inspection was conducted by Hailey Spry of Easterly Point on 12 July 2022. A summary of observations is provided below, with photographs provided in Appendix C. References to site features are shown on Figure 2.

As described below, the majority of the site was covered in dense vegetation, and therefore a thorough assessment of ground conditions across the site was not possible. The ground was generally wet and boggy, with water pooled across various areas of the site.

120 Carrs Drive, Yamba

- Apart from the area surrounding the residential property, which was covered in grass, the reminder of the property was covered in dense vegetation, including weeds, grasses and a mixture of juvenile to mature trees.
- The residential dwelling at 120 Carrs Drive was no longer tenanted and empty. The exterior of the building is constructed primarily of bricks and timber.
- The area surrounding the residential dwelling was predominantly grassed, except for a concrete slab directly adjoining the residential building to the north. A stockpile of timber was located approximately 20 m north of the house and general rubbish surrounded the building. A large make-shift fire-pit, approximately 4 m by 2 m, was present to the immediate west of the house, which appeared to comprise timber off-cuts creating a boundary around the fire, with charcoal directly on the grass. Burnt bottles and cans were present in and around the fire-pit.
- The remnants of a timber cattle loading platform was located near the residential dwelling fronting Carrs Drive.
- An oil drum was located on top of a metal structure, possibly an old tractor attachment, near Shed 1. There was visible oil staining across the ground and dead grass in the immediate area. While a strong hydrocarbon odour was observed in 2021, no odours were observed in 2022.
- A large open shed structure, denoted ‘Shed 1’, was located to the south-west of the residential house, surrounded by overgrown vegetation. The shed was constructed of timber and corrugated iron sheeting, with no visible signs of ACM. The floor of the structure was comprised of bare earth, with various items and rubbish, including batteries, tools, general house-hold ‘hard’ rubbish scattered across the area.
- A barbed wire fence was located to the west of Shed 1, with the stream located approximately 10 m to the west of the fence. The stream was surrounded by dense vegetation, and access to, and along the stream was limited. The stream was shallow, with leaf-litter across the stream bed and orange straining within the sediment. An anoxic/sulfidic odour was observed on disturbance of the sediment.
- The access track following the boundary of 120 - 110 Carrs Drive was overgrown with vegetation and not accessible at the time of the site inspection.

- The structure in the central portion 120 Carrs Drive, referred to as 'Shed 2', comprises a metal and fibro (non ACM) demountable structure, located on raised wooden foundations. It appeared that the structure was possibly used as a small dwelling/granny flat. Directly adjacent to the building was a large IBC container, full of a dark brown coloured liquid. What appeared to be storage structure, sign on tall posts and a timber workbench were also located near the dwelling. It appeared that the former access track running along the northern boundary of 120 Carrs Drive was used to access the dwelling, with a gate near the area, and disturbed grass with no vegetation, appearing to form a driveway.

- In the northern portion 120 Carrs Drive, approximately 200 m west of the neighbouring residential property at 104 Carrs Drive, a large concrete slab is present. This was surrounded by various small structures and rubbish, including:
  - what appeared to a former greenhouse, consisting of a timber structure and damaged green-cloth forming a roof;
  - a timber structure with a corrugated iron roof, possibly a carport;
  - a small demountable structure, similar to Shed 2, built on high raised wooden foundations. The building had a ladder leading up to the structure, and a bedframe and waste was visible inside;
  - a small timber and corrugated iron shed, with various waste observed within and surrounding the shed;
  - waste was observed across the area, including an abandoned car, various plastic and metal petrol and oil drums, scrap metal, fencing, house-hold 'hard-rubbish', gym equipment, timber, corrugated iron, a hot-water service, crab pot, plastic sheeting, bricks, etc.; and
  - the area was overgrown by vegetation.

110 Carrs Drive

This portion of the site was bound to the north by the adjoining residential property, identified as 104 Carrs Drive, Yamba. There was no fence between 104 and 110 Carrs Drive, noting that the site was only recently subdivided. The reminder of the boundaries were generally bound by barbed wire fencing. Observations are described below:

- The grass was generally waist height, with the exception of the former driveway along the southern boundary which was grassed, but not as overgrown.

- There were several areas of what appeared to be stockpiled vegetation, covered with grass and weeds.

- The dumping that was observed along the southern boundary of the property, along the fence line adjacent to the site in 2021 (Easterly Point 2021) was no longer visible.

- A stockpile of timber and corrugated iron sheeting was located on the northern boundary.

The site to the north was in the process of being developed, with approximately 1 – 2 m of fill visible and earthworks occurring across the site.

5.2 Site features

A summary of the main site features is presented in Table 5.1 and referenced in Figure 2.

Table 5.1: Site features

Feature	Location	Description
Steam/creek	Eastern portion of 110 Carrs Drive. Refer to Insert 3 on Figure 2.	Second order stream running through the site, to be retained as part of the proposed development. The stream is covered be dense vegetation and generally not accessible. Where observed, it was shallow with orange-stained sediment.
Residential house	Fronting Carrs Drive, located at 120 Carrs Drive. Refer to Insert 3 on Figure 2.	Residential dwelling built between 1980 and 2004, constructed of brick and timber, with no visible sign of ACMs. The area surrounding the residential dwelling largely comprised of grass, except for a concrete slab directly adjoining the house to the north. A stockpile of timber and general rubbish surrounded the building. An old tractor was also located adjacent to the house along Carrs Drive.
Shed 1	Near residential dwelling fronting Carrs Drive. Refer to Insert 3 on Figure 2.	Large open shed structure surrounded by overgrown vegetation. The shed is constructed of timber and corrugated iron sheeting, with no visible signs of ACM, with the floor bare earth. Various items and rubbish was scattered across the area. Constructed between 1993 – 2004, based on aerial photographs.
Oil drum	Approximately 50 m north of the residential dwelling, near Shed 1. Refer to Insert 3 on Figure 2.	TRHs >C16-C34 detected above management limits at a concentration of 5,300 mg/kg, in area of an oil drum, located on top of a metal structure There was visible oil staining across the metal structure, with a strong hydrocarbon odour observed in the immediate vicinity (Easterly Point 2021).
Shed 2 structures	Located in the central portion of the property. Refer to Insert 1 on Figure 2.	A metal demountable structure with wooden foundations. It appeared that the structure was possibly used as a small dwelling/granny flat. A timber workbench was located near the structure, as well as an IBC that contained a dark-coloured liquid. Constructed between 2004 – 2011 based on aerial photographs. Elevated TRHs detected near Shed 2 (Easterly Point 2021).

Feature	Location	Description
Former residential dwelling and associated structures	Located in the northern portion of 120 Carrs Drive. Refer to Insert 2 on Figure 2.	Former dwelling and sheds/structures, originally constructed between 1971 – 1980, with alterations/ additions pre-1993. Anecdotal information suggests that the concrete slabs observed were the foundation of a former residential dwelling which burnt down in 2013. Several smaller sheds/structures, estimated to have been constructed in the early 2000's, are also located in the area. Various rubbish was observed scattered across the area.

5.3 Integrity assessment

Based on the historical information available for review, there is generally good agreement between the various sources of information in regard to site history and usage. The site history information documented in Section 4, including anecdotal information, is generally consistent with the physical findings of the site, as discussed above.

6.0 Contaminants, media and assessment criteria

This section discusses the potential contaminants of concern, (PCoCs), environmental media of interest and adopted assessment criteria.

6.1 Potential contaminants of concern

The PCoCs are shown in Table 6.1, along with the associated activities or sources of these contaminants.

Table 6.1: Primary contaminants and origins

Activity or Source	Contaminants
Primary contaminants and origins	
Building products and paints	Lead (Pb) and asbestos.
Herbicides and pesticides usage and storage during historical agricultural activities	Arsenic (As), organochlorine pesticides and organophosphorus pesticides (OCPs/OPPs).
Potential uncontrolled filling/dumping at the site	Metals[1], total recoverable hydrocarbons (TRHs), benzene, toluene, ethylbenzene, xylene(s) and naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAHs) and OCPs/OPPs and asbestos.
General farming/household chemical use and storage	Metals, TRHs, BTEXN, PAHs and OCPs/OPPs.
Fuels, oils	Pb, TRHs, BTEXN and PAHs.

Table notes:
1.Arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.

A review of Appendix B of the per-and poly-fluoroalkyl substances (PFAS) *National Environmental Management Plan* (HEPA 2020) was undertaken to determine if activities including PFAS are relevant to the site. The following potentially applicable activity was identified for the site:

- Agriculture; potentially used as an adjuvant or active ingredient in fertilisers and pesticides, firefighting foam used in the poultry industry to destroy infected flocks;

Given the limited cropping undertaken at the site, and that the site was primarily used for grazing land, PFAS was not considered to be a PCoC for the purposes of this investigation.

Further to the above, it is highlighted that PFAS-containing fire-fighting foam (AFFF) [9] is unlikely to have been used on the house fire as AFFF is primarily used for fires containing hydrocarbons, polar solvents, etc.

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[9] Aqueous film forming foams (AFFF) containing PFAS are water-based firefighting foam products used to suppress flammable liquid fires.

6.2 Media

The environmental media of interest was primarily soils.

6.3 Criteria

The below soil assessment criteria were used to evaluate the soil analytical results.

6.3.1 Human health criteria

A Tier 1 assessment was conducted as part of this preliminary investigation, as per Schedule B(1) of the ASC NEPM (2013). A Tier 1 assessment provides an initial screening of the data to determine whether further assessment is required. A range of health investigation levels (HILs) are available:

- HIL A, Standard residential with garden/accessible soil (home grown produce inclduing 10% fruit and vegetable intake, (no poultry), includes children's day care centres, preschools and primary schools. This residential land use includes a variety of building densities, ranging from separate low-density dwellings to high-density unit blocks.

- HIL B, Residential with minimal opportunities for soil access, includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.

- HIL C, Includes developed open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. Does not include undeveloped public open space which should be subject to a site-specific assessment where appropriate.

- HIL D, Commercial/industrial includes premises such as shops, offices, factories and industrial sites.

For PAHs, the benzo(a)pyrene (B(a)P) TEQ criteria provided in the NEPM is derived for the carcinogenic PAHs, with a toxicity equivalence factor (TEF) calculated for each carcinogenic PAH, based on its toxicity relative to B(a)P. The NEPM describes the following:

> *The TEF approach assumes that the risk posed by individual carcinogenic PAHs is additive and proportional to the potency of each compound in the mixture. The potency of individual carcinogenic PAHs is expressed relative to B(a)P.*

PAHs results were assessed using the BaP TEQ approach.

The ASC NEPM (2013, B7) describe that the HILs apply to the top 3 m of soil and recommend the use of a more sensitive land use category, where site specific land uses are not specifically referred to in the scenario descriptions, or alternatively a site-specific risk assessment can be conducted.

Based on the site's location and proposed land use, HIL-A is considered to be applicable to the site.

It is highlighted that HIL-B land use assumes that yard spaces are largely covered by permanent paving, e.g. concrete slabs, and therefore access to soil beneath is largely restricted. Where it cannot be guaranteed that access to 3 m will not occur, e.g. through permanent paving, it must be assumed that receptors can access soils to this depth, and therefore must be assessed as suitable, or otherwise managed.

Further to the above, the results for TRHs and BTEXN were assessed against the health screening levels (HSLs) to determine and risks associated with vapour intrusion. The values for residential A and B are combined for the HSLs as they are based on the same exposure conditions for the vapour inhalation pathway, ie. The same amount of time spent indoors. As a conservative measure, HSLs were adopted for sand, at 0 - 1 m depth.

6.3.2 Ecological criteria

Schedule B(1) of NEPM (2013) provides a range of investigation levels for the protection of ecosystems, referred to as ecologically-based investigation levels (EILs) and ecological screening levels (ESLs), which are applicable for assessment of risk to terrestrial ecosystems.

The EILs for urban residential areas and public open space (80% species protection level) will be referred to. It is noted that Schedule B1 of the ASC NEPM (2013, B1) describes that the EILs principally apply to the top 2 m of soil which corresponds to the root zone and habitat zone of many species.

EILs are generally derived based on summing the ambient background concentration (ABC) (measured at an appropriate reference site) with the added contaminant limit (ACL), calculated based on site-specific soil characteristic properties. Based on the preliminary nature of this investigation, background samples and site-specific soil characteristics were not investigated, and as such, generic ACLs have been referred to, where available for aged contaminants.

While EILs will be referenced in this assessment, based on the depth of application, and proposed depth of imported fill, land use decisions will not be based on the EILS.

6.3.3 Petroleum management Limits

Following appropriate consideration of the HSLs and ESLs, the purpose of the Management Limits is to “avoid or minimise” potential effects of petroleum hydrocarbons. ASC NEPM (2013, B1) provides these as an interim Tier 1 guidance to manage effects of:

- formation of observable LNAPL;
- fire and explosive hazards; and
- effects on buried infrastructure.

Management limits for residential, parkland and open space will be adopted as conservative criteria.

6.3.4 Aesthetic criteria

There are no specific numeric aesthetic criteria, however site assessments require balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity. For example, higher expectations for soil quality would apply to residential properties with gardens compared with industrial settings (ASC NEPM 2013, B1). Issues to be addressed include odours, staining, monolithic deposits, and potentially dangerous material such as rubble with steel, sharps and the like.

The ASC NEPM (2013, B1) describes that sites “that have been assessed as being acceptable from a human health and environmental perspective may still contain such foreign material”. However, “geotechnical issues related to the presence of fill should be treated separately to assessment of site contamination”.

6.3.5 Application of criteria

The ASC NEPM (2013, B1) describes that:

> *The selection of the most appropriate investigation levels for use in a range of environmental settings and land use scenarios should consider factors including the protection of human health, ecosystems, groundwater resources and aesthetics.*

And that “A balance between the use of generic soil, soil vapour and groundwater criteria and site-specific considerations is essential practice in site assessment”. Noting that the ASC NEPM (2013), describes that “Human health should be a primary concern when assessing land use and exposure scenarios”.

7.0 Easterly Point Investigation

The assessment of site contamination (ASC) investigation was conducted in general accordance with a SAQP developed by Easterly Point, which included the development of a preliminary CSM and project-specific DQOs. The SAQP is provided in Appendix B.

7.1 Sampling and analytical strategy

The sampling strategy for site characterisation generally includes the use of either a random, targeted, systematic (e.g. grid-based) or stratified sampling pattern; or a combination of these. The NSW EPA (1995) *Sampling design guidelines* describe that a judgemental, or targeted, sampling pattern is where sampling points are selected on the basis of the investigator's knowledge of the probable distribution of contaminants at the site, and that it can be an efficient sampling method which makes use of the site history and field observations. A grid based sampling pattern, where sampling points are selected at regular and even intervals providing statistically unbiased data that can be statistically evaluated, and also enables the detection of hotspots of a certain size.

A grid based sampling pattern was not considered suitable for the following reasons:

- A grid-based sampling pattern that meets the sampling density described in NSW EPA 1995 was not considered to be warranted or a viable sampling pattern for this site based on the historic land use, i.e. no significant industrial usage.
- A grid-based sampling density, as per NSW EPA (1995), would equate to over 100 sample locations for the developable area (11 paints per ha[10]), and would be based on detecting a circular hot-spot with a diameter of 35.6 m with 95% confidence, where a 'hotspot' is defined as "a localised area where the level of contamination within that area is noticeably greater than this in the surrounding areas". As the land use is relatively uniform, a grid of this size is unlikely to uncover areas of contamination that are not already being targeted via the judgemental sampling plan; and
- A grid-based sampling pattern was unable to be achieved based on the dense vegetation severely limiting access across large portions of the site.

As such, the following sampling strategy was adopted:

- the site will be stratified[11] based on the proposed developable area, with physical sub-surface investigations limited to area of development in the eastern portion of the site;
- sample locations were targeted to areas of potential concern, e.g. the current and former infrastructure; and
- a selected number of sampling points were positioned in locations away from known potentially contaminating features to allow broad site coverage.

Further to the above, the investigation included both 'field' and 'analytic' samples, as described by NSW EPA (2020b) as:

> *The term 'sample' can also refer to visual and olfactory observations, descriptions and field logging, which can be field-screened and then subject to other non-laboratory assessments and tests. These are known as field samples.*

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[10] Based on detecting circular hotspots by using a systematic sampling pattern.

[11] NSW EPA (1995) define a stratified sampling pattern as dividing the site into sub-areas according to geological or geographical features, nature of contamination, former usage patter of the site, intended future use of the sub-area, and other relevant factors.

> *Any sample that is sent to a laboratory to be analysed is known as an analytical sample. An analytical sample is a field sample, but a field sample may not necessarily be an analytical sample.*
>
> *In statistics, 'sample' is also used to mean n, the number of samples or individual measurements. Statistical analysis and inference with prescribed error rates is done mainly with analytical samples. Under the multiple lines of evidence/weight of evidence approach, field samples are critical to inform the CSM and assist in defining the sources and pathways.*

In summary, the adopted sampling strategy for the site is considered to be an effective data collection process which meets the project objectives. It includes a strategy:

- that provides baseline data for the site, which may be used in future investigations;
- is targeted to most likely contaminating areas based on site history review; and
- is specific and justifiable.

A summary of the sample locations is provided in Table 7.1, along with justification for each location.

Table 7.1: Justification for sample locations

Sample	Feature	Justification
SED01	Creek	To understand current condition, and inform baseline assessment and any potential management/ remedial requirements. Only one location assessed based on access restrains.
BH09 and SS01	Shed 1	Based on observed storage within the shed and bare earth floor.
BH08	Previously detected elevated hydrocarbons in area of an oil drum	Delineation of impact, both vertically and horizontally.
BH01 – BH03	Shed 2 structures	Investigation into the source, nature and extent of the elevated TRHs detected in Easterly Point 2021, as well as additional coverage of the area. BH01 was targeted to the IBC tank, where slightly elevated concentrations were detected previously. BH02 was targeted to an area near what appeared to be a workbench. BH03 was targeted to an area of grass disturbance, in a location possibly used as a driveway.

Sample	Feature	Justification
BH05 – BH07	"Northern structures", former residential dwelling and various structures and waste in northern portion of the site	Further investigation into potential impacts in the area of the former dwelling, in particular for asbestos and lead, given the age of the building and extensive fire, as well as additional coverage of the area based on observed waste. BH05 was targeted to an area of scattered rubbish, collected directly beneath a blue plastic "Approved DG[12]" container. BH06 was targeted to the old shed which included various waste within and surrounding the shed. BH07 was targeted to edge of the concrete slab of the former residential dwelling.
BH04, ASSBH11	110 Carrs Drive	Targeted to driveway reportedly filled with imported road-base.
ASSBH01 – ASSBH10, ASSBH12 - ASSBH15	Whole of site	Broad site coverage. Not targeted to specific features/known contaminating activities.

Table notes:
ASSBHxx represents boreholes drilled primarily for the purposes of the acid sulfate soils investigation, noting they still represent field sample locations, and analytic locations where samples analysed for PCoCs.

A total of 26 locations were investigated across the site, 15 of those being analytic and 11 field samples. A summary of locations investigated and samples analysed from each area is presented in Table 7.2.

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[12] Dangerous Goods.

Table 7.2: Summary of field and analytic samples

Area	Number of field locations[1]	Number of field and analytic locations[2]	Total locations	Number of samples analysed[3]
120 Carrs Drive				
Broad site coverage	8	2	10	2
Shed and oil drum	0	3	3	5
Stream	0	1	1	1
Shed 2 structures	0	3	3	4
Northern structures	0	3	3	6
110 Carrs Drive				
Driveway	0	2	2	4
Broad site coverage	3	1	4	1
Totals	*11*	*15*	*26*	*23*

Table notes:
1. Includes only field samples.
2. Includes both field and analytic samples, i.e. a field sample = analytic sample.
3. Number of individual samples analysed at the laboratory. May include multiple samples analysed from various depths from each location.

7.2 Sampling and analytical methodology

The investigation was undertaken in accordance with Easterly Point's standard operating procedures (SOPs), which are consistent with EPA made and approved guidelines and industry standards, and include:

- EPFW-PR01, Soil sampling – general;
- EP SHE-PR02, Personal protective equipment;
- EP SHE-PR04, Decontamination of personnel; and
- EP SHE-PR06, Decontamination of sampling equipment.

The above procedures were attached to the SAQP, and included in Appendix B. A general overview of the sampling methodology is provided below.

Sample locations were either investigated using a 100 m hand auger or truck-mounted drill rig fitted with solid-flight augers. Samples were collected either directly from the auger or borehole with a gloved hand. To avoid cross contamination, care was taken to ensure samples were not collected directly from material attached to the auger. A new pair of disposable gloves was used to collect each sample, and the auger washed with Decon90 and water between locations.

All soil samples were immediately collected into laboratory supplied glass jars and filled to the top to minimise headspace. Samples were then be placed directly into chilled eskies for transportation to the laboratory under chain of custody (CoC) documentation.

A photoionisation detector (PID) was used to screen for volatile organic compounds (VOCs) where suspected VOC impacts were identified. The PID calibration record is provided in Appendix D.

7.2.1 Laboratory analysis

The primary laboratory was Eurofins Brisbane while the secondary laboratory was ALS Brisbane, both of whom are NATA accredited.

Samples were selectively chosen for analysis based on the borehole location and physical findings. A total of 23 individual samples were analysed at the laboratory for a range of PCoCs, as described in Section 6.1. A selected number of samples were also analysed for TRHs with silica gel clean-up which is a procedure that removes interferences from non-petroleum hydrocarbons[13] and therefore provides a better estimate of actual 'petroleum hydrocarbon' concentrations in samples.

Analysis for asbestos was conducted at the laboratory in accordance with AS 4964 (2004): *Method for the Qualitative Identification of Asbestos in Bulk Samples* and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

Quality control samples, including field and inter-laboratory duplicates, were generally collected at a rate of 10%, as required by ASC NEPM (2013, B2).

7.3 Data usability

Information generated from environmental investigations requires some statement in regard to the usability of the data[14], and therefore quality assurance (QA) and quality control (QC) are an integral part of the analysis and interpretation of environmental data.

All site work was completed in accordance with standard Easterly Point sampling protocols, including a QA/QC program, SOPs and a set of data quality indicators (DQIs). A data usability assessment was performed on the soil data collected by Easterly Point, which is summarised in Appendix E, and includes background information to data usability.

The results of the data usability assessment are sown below:

Precision

The data shows minor variability, with one field duplicate RPD exceedance for zinc, and two RPD exceedances for zinc and F3> C16 – C34. The concentrations resulting in these RPDs are relatively low, and all below the HILs/HSLs, and are likely resulting from small differences arising from sample heterogeneity. As such, these minor exceedances are not considered to affect the precision and outcomes of this investigation.

Laboratory duplicates were analysed at the required frequency and RPD results were within the acceptance criteria.

Accuracy

The accuracy of the analysis is confirmed by matrix spike, surrogate spike and LCS recoveries within the acceptance criteria.

Representativeness

No outliers have been reported for QC samples collected to assist in the qualification of representativeness. Trip spike and trip blank samples were not collected, however all primary

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[13] Including non-petrogenic hydrocarbons of biological origin, e.g. vegetable/animal oils and greases, humic and fatty acids often associated with soil organic matter.

[14] To avoid confusion with the data quality objectives (DQOs) process, the term data usability is used rather than data quality.

samples reported non-detect when analysed for volatiles, therefore this is not deemed significant.

Comparability

The data is considered to be acceptable, with consistent sampling staff, NATA accredited laboratories used and all LORs below the relevant criteria.

Completeness

Laboratory and field documentation is considered to be complete.

Summary

While some minor non-conformances were identified with the data e.g. field duplicate RPD exceedances, no trip spikes or blanks, overall, the data is considered to be of an acceptable quality and to be suitable to support the results of this preliminary investigation.

8.0 Results

This section presents the sub-surface conditions encountered as well as the analytical results following laboratory analysis.

8.1 Subsurface conditions

The subsurface conditions encountered are summarised below, with site observations documented in the geological logs in Appendix F, including field observations, material descriptions and notation of samples analysed.

In general, the profile across the site was relatively consistent, consisting of a black, silty, sandy clay overlying saturated white sands from approximately 0.3 m depth. A photograph showing the general profile is provided as Plate 8.1. A summary of fill and aesthetic observations is provided in Table 8.1

Plate 8.1: Borehole, ASSBH07
General profile encountered, black clays overlying saturated white sand

Table 8.1: Summary of fill and aesthetic observations

Borehole	Depth (m)	Description
BH04	0.0 – 0.15	Fill. Silty sandy clay with large gravels – possibly re-worked natural.
	0.15 – 0.5	Fill. Clayey sand with gravels (possibly road base), small black gravels and large chunks (< 5 cm) of asphalt.
BH07	0.15 – 0.3	Fill. Clayey gravel with charred/burnt timber.
BH08	0.0 – 0.15	Dark oil staining. No sheens or odours noted.
BH09	0.0 – 0.2	Silty sandy clay with rusty metals/nails on the surface.

Borehole	Depth (m)	Description
ASSBH06	0.0 – 0.2	Fill. Orange, grey, brown clayey sand.
	0.2 – 0.8	Fill. Grey black sandy light clay.

8.2 Analytical results

The analytical results from the Easterly Point sampling program are summarised below, and presented in Tables 1- 5, attached. Evaluation of the results, in combination with the site history information and limitations of the investigations are described in Section 9, along with an updated CSM. Laboratory reports are provided in Appendix G.

8.2.1 Metals

All samples returned concentrations of metals either below the LORs or below the HIL-A criteria, with the exception of lead. The metals concentrations detected are presented in Figure 8.1, as the range, median and interquartile range (25th quartile to 75th quartile).

Lead was detected at one sample location above the HIL-A criteria of 300 mg/kg, with a maximum concentration of 900 mg/kg. This sample was collected from surface soils in the area of the northern structures, immediately adjacent to the concrete slab of the former residential dwelling.

This sample was subsequently analysed for the Australian Standard Leaching Procedure (ASLP) which provides an indication of the leaching capacity of the substance, under neutral pH conditions. The lead concentration in the leachate was 160 µg/L.

Zinc was the only metal detected above the EILs, noting the EIL was based on the ACL only. Based on the ubiquitous nature of zinc, the relatively low concentration detected and the proposed land use (including importation of fill across the site and therefore minimal soils in the final, upper 2 m profile), this is not considered to be significant.

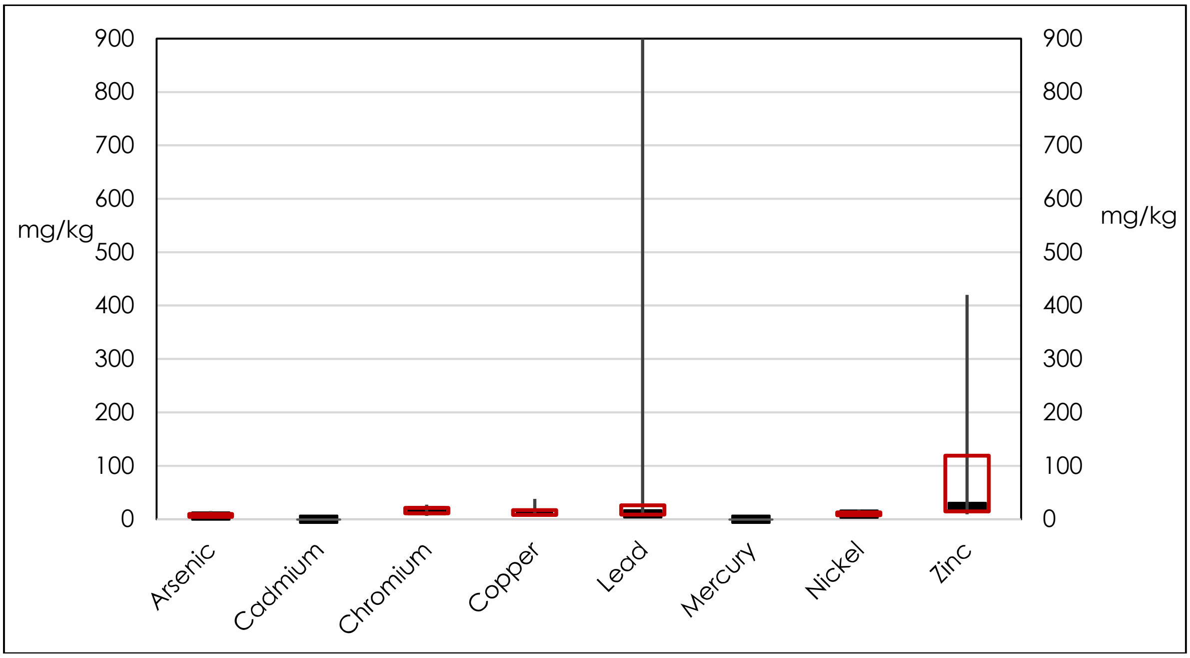

Figure 8.1: Heavy metals (mg/kg)

8.2.2 TRHs

All samples returned concentrations of volatile F1 C6 – C10 TRHs (minus BTEX) below the laboratories LORs.

Two samples returned concentrations of F2 >C10 - C16 TRHs (minus naphthalene) above the LORs, with concentrations of 140 mg/kg and 62 mg/kg, detected at BH08_0.0-0.1 and SS01, respectively. The concentration detected at BH08 is above the residential HSLs for sandy soils at 0 - < 1 m depth of 110 mg/kg.

TRHs >C16 - C34 fraction were detected above the LORs within 11 samples, with elevated concentrations of 46,000 mg/kg and 3,700 mg/kg detected at BH08_0.0-0.1 and BH08_0.15-0.2, above the management limits of 2,500. Elevated concentrations were also detected at SS01 at 1,300 mg/kg. All other concentrations were detected between 110 mg/kg – 310 mg/kg. Three samples collected from BH08 and SS01 also exceeded the EILs.

TRHs >C34 – C40 fraction were detected above the LORs within nine samples, with elevated concentrations of 4,100 mg/kg and 780 mg/kg detected at BH08_0.0-0.1 and SS01, respectively. All other concentrations detected ranged between 100 mg/kg – 310 mg/kg. No concentrations exceeded the management limits.

Nine samples were analysed for silica gel clean-up, with seven of those samples reporting non-detect concentrations. The two samples from BH08 returned elevated concentrations, as shown in Table 8.2. As expected for this location, there was only a minor reduction in concentrations, suggesting the impacts are primarily petroleum-related.

Table 8.2: Silica gel analysis at BH08

Sample location	Depth (m)	F2 >C10 - C16 TRHs minus naphthalene		TRH >C16 - C34 Fraction		TRH >C34 - C40 Fraction	
		Standard analysis	Silica gel	Standard analysis	Silica gel	Standard analysis	Silica gel
Analytical							
BH08	0.0-0.1	140	97	46,000	43,000	4,100	4,100
BH08	0.15-0.2	nd	nd	3,700	3,200	310	300

8.2.3 Organics

All samples returned concentrations of PAHs, BTEX, OCPs and OPPs below the laboratories LORs.

8.2.4 Asbestos

Four samples were analysed for asbestos with all samples reporting concentrations below the nominal reporting limit of 0.01% w/w.

9.0 Discussion and updated CSM

9.1 Discussion

9.1.1 Assessment of site contamination

The assessment of site contamination is presented below for each area investigated. The evaluation incorporates samples collected during the current investigation as well as those collected in 2021 (Easterly Point 2021). Combined data tables are shown in Tables 6 and 7, attached.

Northern structures

Elevated concentrations of lead were detected in surface soils at BH07, located adjacent to the concrete slab of the former residential dwelling. Figure 9.1 shows the lead data set for the samples collected from the area of the Northern Structures against the site data for all other areas. While the majority of samples exhibited concentrations below the HIL-A criteria, it is clear that samples from the area of the northern structures exhibit elevated concentrations above background.

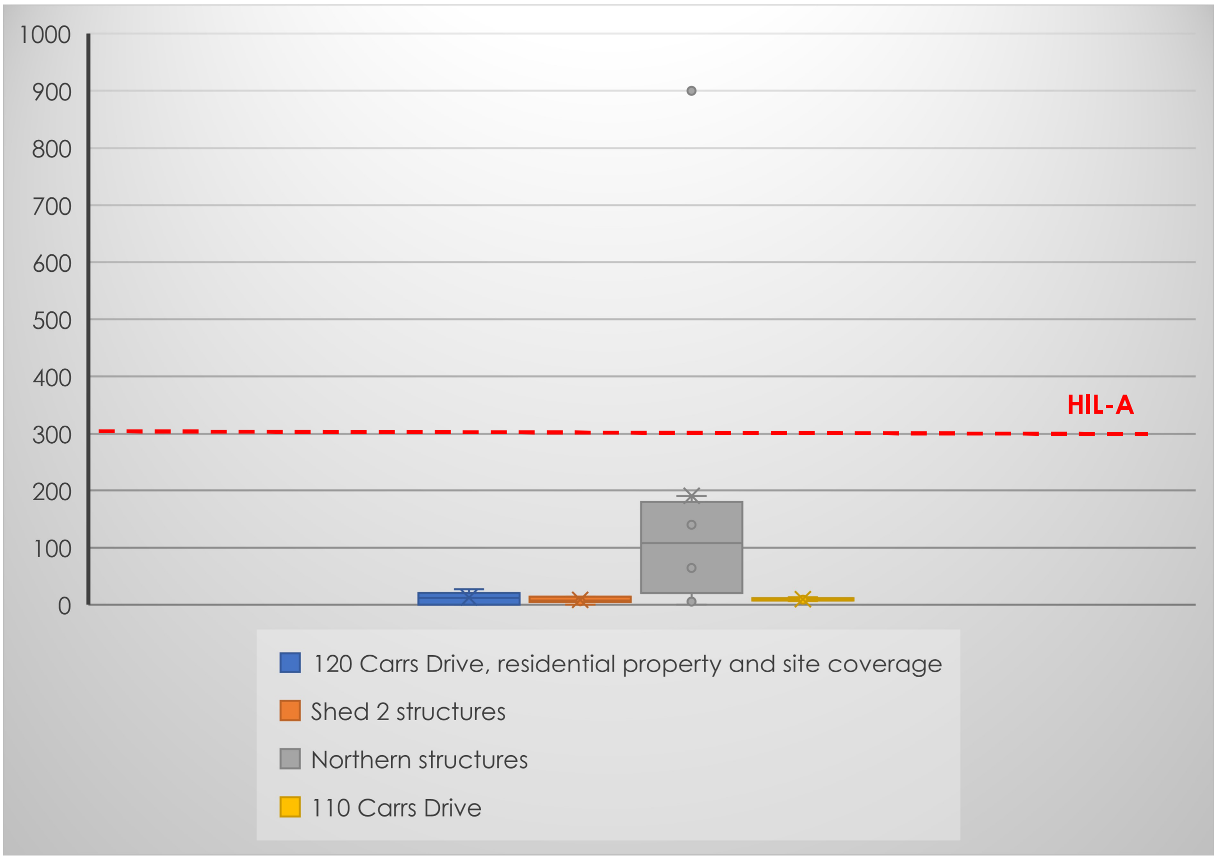

Figure 9.1: Lead concentrations (mg/kg), grouped by area

range — median ☐ inter-quartile range x mean ° outlier

The elevated lead concentrations detected near the concrete slab decrease with depth, as shown in Table 9.1. This suggests that impacts are primarily located within the fill overlying another fill layer containing charcoal and burnt timber encountered at 0.15 m.

While zinc was not detected above the HIL-A land use criteria, the concentrations are elevated when compared to the broader site data set, and show a similar trend as lead through the profile. Zinc is commonly associated with building products, in particular galvanised roof sheets, and these results indicate that impacts are likely associated with current and former structures, as well as the widespread waste scattered across the area.

Table 9.1: Lead and zinc concentrations at BH07 (mg/kg)

Borehole	Depth (m)	Material type	Lead	Zinc
BH07	0.0-0.1	Fill. Black sandy, silty clay.	**900**	420
	0.15-0.25	Fill. Black clayey gravel with charred/burnt timber.	150	190
	0.3-0.35	Light grey/brown clayey sand.	5.4	12

Given the age and various reconstructions of the former dwellings (original structures constructed between 1971 - 1980), it is possible that the lead impacts are a result of leaded paint, or lead-impacted dust, which could have resulted from renovations and/or demolition of the various structures over the years and the house-fire and its subsequent demolition. NSW EPA and Planning NSW (2003) describe that the primary sources of lead dust in residential scenarios include the breakdown of old lead paint, previous renovations in the home and emissions from burning coal or lead-painted wood, and that "regardless of how lead is released into the environment, it does not break down".

The assumed source of lead contamination indicates that the impact is not a 'hotspot' but rather there is likely to be widespread impact around the concrete slab in the area of the former building/s.

Based on the likely source, fate and transport characteristics of lead, the decreasing concentrations detected through the profile and that the NEPM (2013, B5c) describes that "there is little potential for Pb to leach to groundwater", the leaching and migration of lead is not considered to warrant further investigation.

It is highlighted that asbestos was not detected in the analysis of three samples collected from the area.

Shed 2 structures

Some minor detects of heavy-end TRHs were detected in the area of the Shed 2 structures, however, were all below relevant criteria, including the EILs. This, combined with the low concentrations of metals detected and the absence of any physical indications of contamination, suggests that no significant or widespread contamination is located in this area.

120 Carrs Drive

Petroleum hydrocarbon impacts were detected in the area of an oil can, near Shed 1. These impacts are not unexpected given the observed source of contamination and visible oil staining. The concentrations detected are above both the management limits and HSLs for vapour intrusion for residential land use.

The ASC NEPM (2013, B1) describes that "assessment of petroleum impacts should include evaluation of risks via the groundwater pathway (e.g. consumption of contaminated groundwater that is not considered in the HSLs), the risk to groundwater resources and appropriate consideration of aesthetics". The risk to groundwater is considered to be low based on the following:

- Visual observations indicated that the contamination was limited to the shallow soils, with dark staining observed to approximately 0.15 m depth. No oily sheens or odours were observed, indicating that the contamination has undergone biodegradation to some degree, which is supported by the length of time since the spill occurred, i.e. pre-July 2021.

- The analytical results shows a clear decrease in concentrations with depth, as shown in Table 9.2, indicating that the impact is largely contained to surface soils.

- The contamination is clearly attributed to a specific source, with the oil can visible during the 2021 and 2022 investigations, indicating that there is a limited and finite source of contamination, and therefore unlikely to form a large and widespread groundwater plume.

- The borehole was extended to the depth of groundwater, with no odours, sheens or staining observed. A sample collected from saturated soils returned analytical results significantly less than that detected in the surface, and not at concentrations indicative of a free phase plume.

Table 9.2: TRHs concentrations in the area of the oil drum (mg/kg)

Borehole	Depth (m)	Material type	>C16 - C34 Fraction	>C34 - C40 Fraction
BH08	0.0-0.1	Black silty clay with dark staining.	**46,000**	4,100
	0.15-0.2	Black silty clay.	3,700	310
	0.4-0.45	Light brown sand.	310	130
HA03	0.0 – 0.1	Brown silty clay.	5,300	790
	0.2 – 0.3	Brown sand.	nd	nd

Elevated TRHs were also detected in Shed 1 above the EILs, however at concentrations below the management limits. Sampling conducted from locations around the residential dwelling did not detect elevated concentrations above the adopted criteria, and no evidence of widespread filling was observed.

While the impacts in the area of the oil can are limited, this area is not currently suitable for residential land use, without remediation.

9.1.2 Aesthetics

As summarised in Table 8.1, minor areas of aesthetic impacts were observed. The primary areas of concern include the asphalt used and detected within fill in the area of the driveway along the southern boundary of 110 Carrs Drive, and the charcoal/burnt timber within BH07 near the concrete slabs in the northern portion of the site.

Contaminant concentrations in the samples from the driveway were generally low, with all concentrations of PAHs (a primary contaminant of asphalt and bitumen) below the LORs. The asphalt in fill is not considered to require further investigation or remediation, as per Section 3.6.2 of Schedule B1 of the ASC NEPM (2013).

While contaminant concentrations detected in the layer of charcoal/burnt timber fill were generally low, given the impacts detected in the overlying fill, the shallow depth of and to this layer (0.15 – 0.3 m depth) and the minimal samples collected from this layer, it is recommended that this layer is excavated and removed from the site with the overlying fill.

9.1.3 Sampling limitations

The sampling strategy adopted was based on providing the client with information regarding the contamination status of the site for the purposes of a preliminary investigation. The sampling locations were positioned in both opportunistic and targeted locations, limited by site access constraints. While locations were positioned to best target areas of concern, as identified from the site history review and site inspection, an intrusive investigation was not undertaken across large areas of the site, with the number of targeted locations limited in each area. It is therefore possible that areas of contamination may still exist, and not all areas of the site were investigated, e.g. area of historical intensive agricultural use. It is further highlighted that the investigation was limited to the eastern portion of the site, in the proposed developable area.

No filling with extensive building or demolition waste was observed, however, ground conditions, contaminants, and material types/composition can vary between sampling locations, and this should be considered when extrapolating between sampling locations. Except at each specific sampling location, the nature, extent and concentration of contamination is inferred only.

As described in the ASC NEPM (2013, B2) "tests pits and trenches expose a large surface area for visual assessment of soil profiles and potential contamination and generally allow the investigator to gain a better appreciation of soil features and soil heterogeneity than that obtained with an individual borehole". It is highlighted that while the use of boreholes is not recommended to allow clear visual assessment of the subsurface, especially where asbestos containing material (ACM) may be present, the methodology was adopted for preliminary investigation purposes and based on budget and access restraints.

It is emphasised that the level of investigation undertaken is commensurate with risk, i.e. the more sampling and investigations undertaken, the more information is known about the site, and therefore the lower the risk of unforeseen contamination. The preliminary site investigation has been undertaken to meet the specific objectives, and ultimately, Clifton Yamba Land need to make their own determination as to the level of assessment required prior to site development.

9.1.4 Site suitability

Based on the discussion presented above, Easterly Point recommends the following works are conducted to ensure site suitability for the proposed residential development.

The impacted surficial soils from the area surrounding the concrete slab in the northern portion of the site and the hydrocarbon impacted soils in the area of the oil drum should be excavated and disposed of off-site in accordance with the *Protection of Environment Operations* (POEO) *Act 1994* and the NSW EPA waste framework. The works should be undertaken in accordance with a remediation action plan (RAP) and validation samples collected from the underlying soils to ensure all contaminated material has been removed.

This option is considered to be the most viable option, as it is understood that all vegetation is required to be removed as part of the development, which will likely include the removal of some surface soils, and will not require any long-term management or notations of remaining contamination on the certificate of title.

Where this option is not acceptable to the client, it is possible to certify the site is suitable for residential land use, with no remedial works undertaken, however, a long-term management plan will be required.

The impacted material in the areas of concern can remain in-situ, however, a long-term contaminated land environmental management plan (EMP) must then be developed to ensure the risks of exposure to future receptors are managed. The EMP should comply with

NSW EPA (2020a and 2022), where EPA (2022) describes that "A contaminated land environmental management plan should be prepared whenever residual contamination requires management, or where any restrictions on use apply to the land under the NSW contaminated land management framework".

An EMP must be reasonably legally enforceable, for example because compliance with it is a requirement of a notice under the *Contaminated Land Management* (CLM) *Act 1997* or of development consent conditions issued by the relevant consent authority. The relevant authority (the EPA or the local authority in these cases, respectively) should be asked their view on the legality of the draft EMP. How implementation of an EMP can reasonably be made to be legally enforceable should take into account exempt and complying development which may occur at the site (Section 3.4.6 of EPA 2017).

There must also be appropriate public notification of any restrictions applying to the land to ensure that potential purchasers or other interested individuals are aware of the restrictions, for example appropriate notations on a planning certificate issued under Section 149(2)[15] of the *Environmental Planning and Assessment Act 1979* or a covenant registered on the title to land under Section 88B of the *Conveyancing Act 1919* (Section 3.4.6 of EPA 2017).

Site development

The ASC NEPM (2013, B7) describes that "the HILs do not specifically address short-duration exposures that may occur during construction and maintenance of a site (including intrusive works). These exposures should be addressed on a site-specific basis".

As such, any works conducted on the site, in particular, in the areas of concern, should be done so in accordance with a management plan. The management plan can be integrated into a site construction environmental management plan (CEMP), which should also integrate the findings and recommendations presented in the ASSMP.

Based on the limitations outlined above, and in Section 1.3, it is also recommended that site works should be conducted in accordance with an unexpected findings protocol (UFP). A UFP is a procedure that provides information to a person conducting intrusive work on a site in regard to the actions/procedures required, should they uncover any unexpected or suspicious materials with the potential to be wastes or relate to contamination.

9.2 Updated conceptual site model

A CSM is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors, with each source-pathway-receptor having to form a complete pathway for there to be a potential risk of harm.

The preliminary CSM developed by Easterly Point prior to the field investigation, and included in the SAQP, has been updated based on the findings of the current investigation. The updated CSM has been developed based on the current known information, obtained from the site history review, site inspection, anecdotal information and sampling program, and is described below and shown graphically in Figure 9.1 (current land use) and Figure 9.2 (proposed land use).

The source-pathway-receptor summary includes:

Sources:
- lead in surface soils;
- TRHs in surface soils;
- inorganic and organic pesticides; and

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[15] Subsequently amended to Section 10.7(2) of the EP&A Act.

- aesthetics in shallow soils.

Off-site sources:
- no distinct off-site sources of contamination were identified in the immediate area based on publicly available licences/notices and site inspection conducted in July 2022.

Receptors:
- future site construction workers;
- future residents (adults and children); and
- off-site ecological receptors, in particular aquatic ecosystem associated with the on-site second order stream and Oyster Channel.

Pathways:
- dermal contact with impacted soils, based on current site condition;
- dermal contact, dust and ingestion for future site development workers and residential receptors; and
- inhalation of volatile organic compounds (VOCs), based on current site condition.

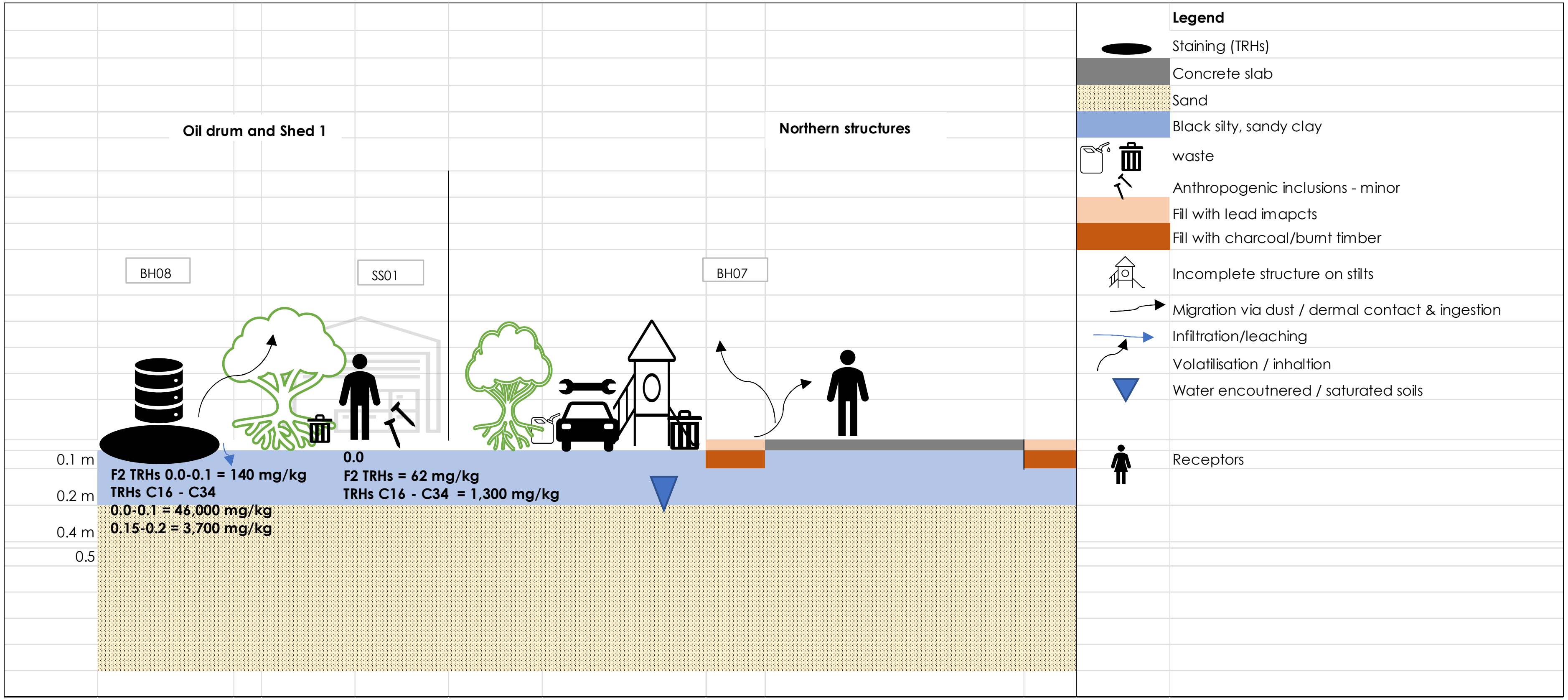

Figure 9.1: Updated CSM – cross-section – current land use
All materials, features and depths unconfirmed estimate

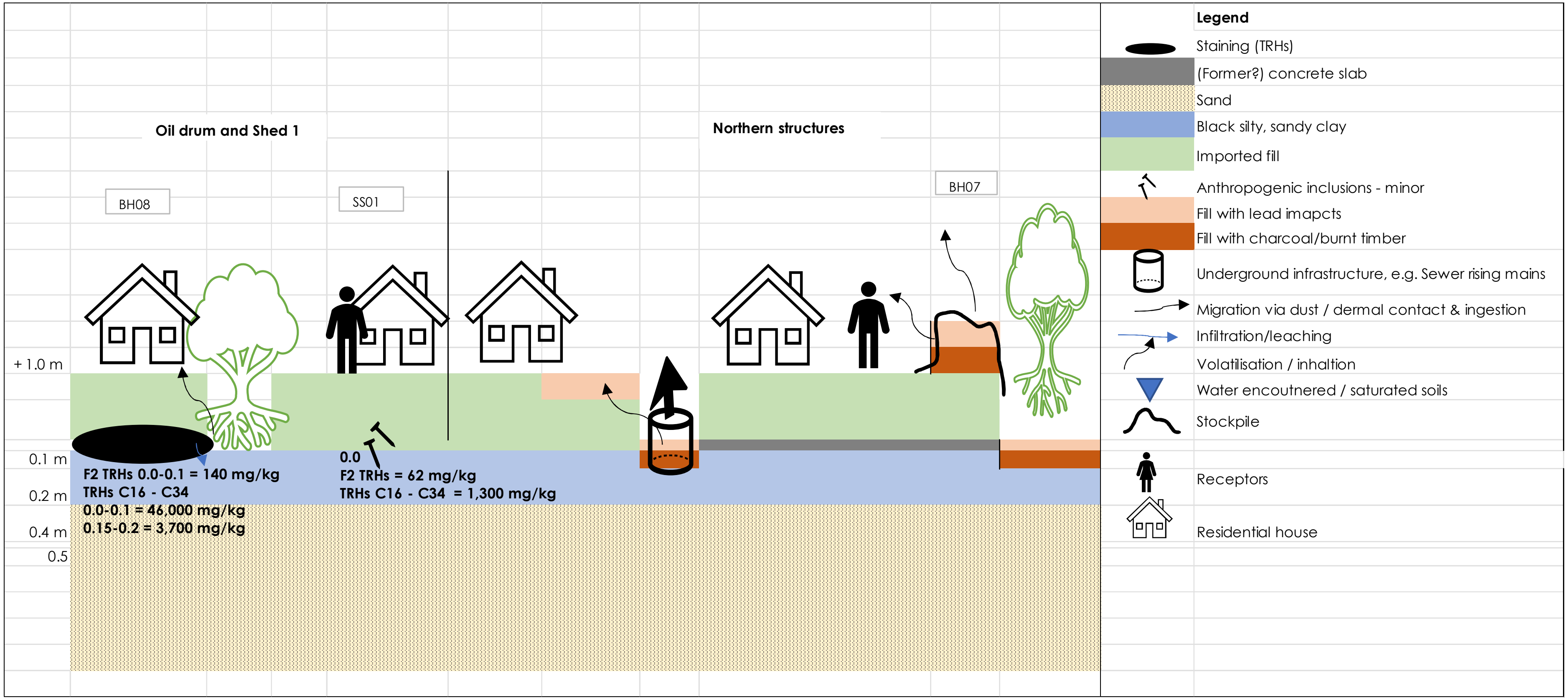

Figure 9.2: Updated CSM – cross-section – proposed land use
All materials, features and depths unconfirmed estimate

10.0 Conclusions and recommendations

These investigation conclusions and recommendations are based on the information described in this report and appendices and should be read in conjunction with the complete report, including Section 1.3, Limitations.

The known site history, in combination with site investigation, anecdotal information and CSM, have identified the primary contaminating activities to be the use of the site for rural residential land use, with various areas of waste identified across the site.

The contamination identified is attributed to clear sources of contamination, and it is recommended that the following works are implemented during site development:

- The impacted soil in the area of the oil drum should be excavated and disposed of off-site in accordance with the NSW EPA waste framework. Given delineation samples indicated the impact has not extended to depth, it is anticipated that the works will result in an excavation of approximately 2 m x 2 m x 0.4 m depth.

- Unless additional sampling is conducted to prove otherwise, the soil surrounding the concrete slab of the former residential dwelling should be considered as impacted given the likely mode of contamination, i.e. demolition and/or fire of the buildings. It is recommended that the surface soil surrounding the concrete slab be excavated and disposed of off-site in accordance with the NSW EPA waste framework. Given the impacts are not visually distinguishable, validation sampling is recommended following removal of impacted soil to confirm the soil is suitable for low-density residential land use.

- Investigation via a sampling and analysis program of the area of intensive agricultural use in the eastern portion of 110 Carrs Drive.

- If the western portion of the site is to be developed in the future, investigations in this area should be conducted.

Apart from the aforementioned areas, no other significant or widespread contamination has been identified from the preliminary sampling program conducted, and concentrations of PCoCs were below the land use criteria for low-density residential use. It is however, emphasised that the sampling plan was limited to accessible areas of the site, and an assessment across the whole site has not been conducted. It is therefore recommended that the site development works are conducted in accordance with a site-specific UFP.

Overall, it is considered that the site can be made suitable for residential land use if the above recommendations are implemented. It is considered that these recommendations can be implemented during development works.

11.0 Glossary and references

11.1 Glossary

ASC	Assessment of site contamination
BTEXN	Benzene, toluene, ethyl benzene, xylenes and naphthalene
CLM	Contaminated land management
CSM	Conceptual site model
DSI	Detailed site investigation
DQOs	Data quality objectives
EIL	Ecological investigation level
ESL	Ecological screening level
HIL	Health Investigation Level
HMSR	Heavy Mineral Sand Residues
HSL	Health based screening level
LOR	Laboratory of Reporting
NATA	National Association of Testing Authorities
NEPM/C	National Environmental Protection Measure/Council
OCPs	Organochlorine pesticides
OPPs	Organophosphorus pesticides
PAHs	Polycyclic aromatic hydrocarbons, including the USEPA 16 priority pollutants: naphthalene; acenaphthylene; acenaphthene; fluorine; phenanthrene; anthracene; fluoranthene; pyrene; benzo(a) anthracene; chrysene; benzo(b)fluoranthene; benzo(k) fluoranthene; benzo(a)pyrene; indeno(1.2.3.cd)pyrene; dibenz (a.h)anthracene; and benzo(g.h.i)perylene
PCoCs	Potential contaminants of concern
PFAS	Per-and poly-fluoroalkyl substances
PID	Photoionisation detector
PSI	Preliminary site investigation
QA/QC	Quality assurance/quality control
SWL	Standing water level

11.2 References

Australian and New Zealand Environment and Conservation Council (ANZECC)/Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, ANZECC/ ARMCANZ, Paper No 4, Canberra.

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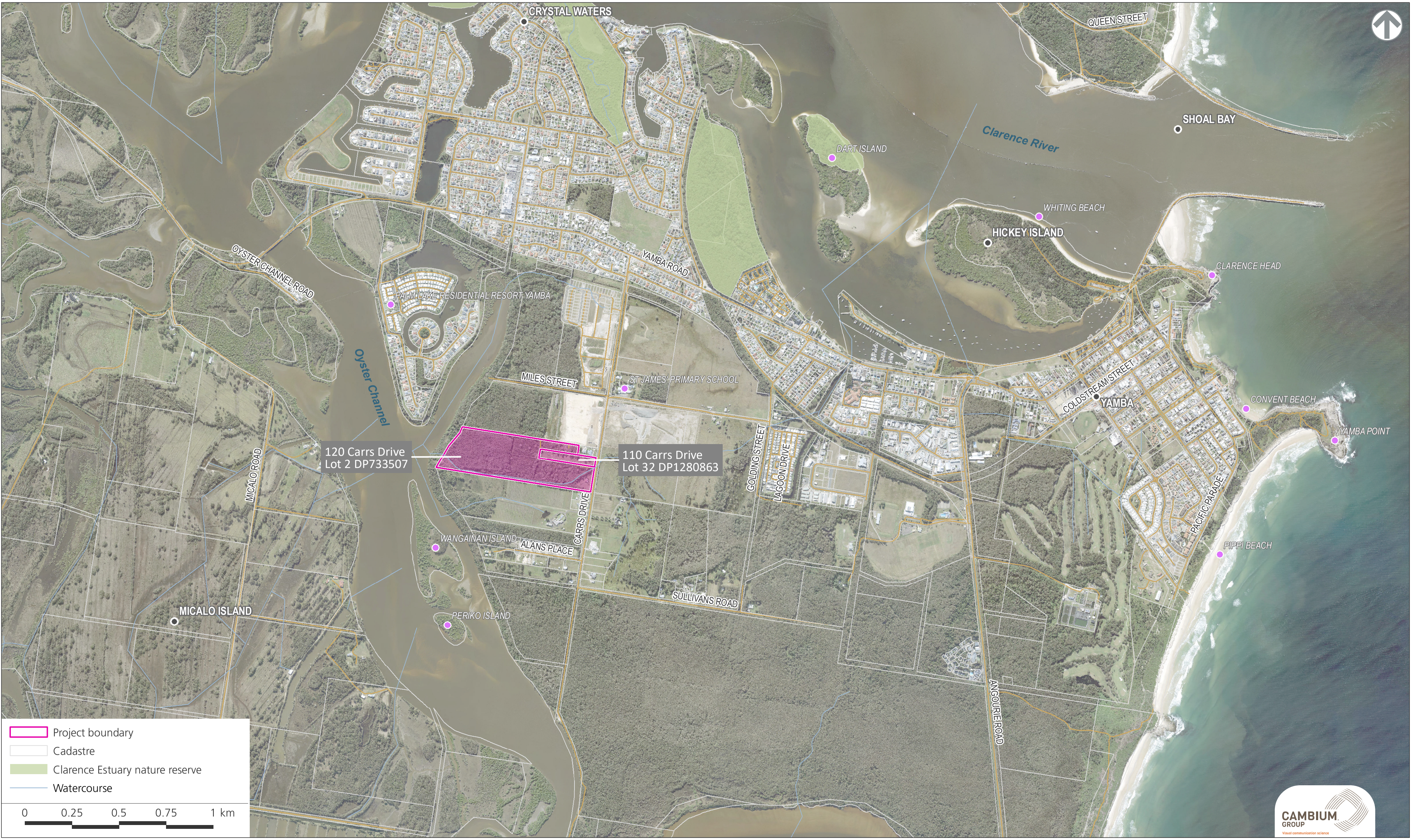
Standards Australia (1999) *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances (AS 4482.2-1999)*.

Figures

Figure 1
Site location

110 - 120 CARRS DRIVE | YAMBA
PRELIMINARY SITE INVESTIGATION



Source: LPI (2022), Aerometrex (2022), Easterly Point (2022), Cambium Group (2022).

031252_PSI_F1_Site_location_220728_v01

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Figure 2
Site features

110 - 120 CARRS DRIVE | YAMBA
PRELIMINARY SITE INVESTIGATION

Source: LPI (2022), Aerometrex (2022), Easterly Point (2022), Cambium Group (2022).

031252_PSI_F2_Site_features_220728_v01

Figure 3
Sample locations

110 - 120 CARRS DRIVE | YAMBA
PRELIMINARY SITE INVESTIGATION

Source: LPI (2022), Aerometrex (2022), Easterly Point (2022), Cambium Group (2022).

031252_PSI_F3_Sample_locations_220728_v01

Tables

Table 1: Summary of Sampling and Analysis

Sample	Depth (m)	Location	TRHs / BTEXN	TRHs Silical Gel	8 Metals	OCPs / OPPs	PAHs	Asbestos	Hold
PSI, 12 July 2022									
BH01	0.0-0.1	Shed 2 structures	1.00	x	x	x	x		
BH01	0.2-0.3			x					
BH02	0.0-0.1		1.00		x				
BH02	0.3-0.4								x
BH03	0.0-0.1		1.00	x	x	x			
BH03	0.15-0.25								x
BH04	0.1-0.2	110 Carrs drive - driveway	1.00	x	x	x	x		
BH04	0.3-0.35		1.00	x	x	x	x	x	
BH05	0.0-0.1	Northern structures	1.00	x	x				
BH06	0.0-0.1		1.00		x	x	x	x	
BH06	0.3-0.4		1.00		x	x	x		
BH07	0.0-0.1		1.00		x	x	x	x	
BH07	0.15-0.25		1.00		x	x	x	x	
BH07	0.3-0.35		1.00		x	x	x		
BH08	0.0-0.1	Shed and oil drum on 120 Carrs Drive	1.00	x	x	x	x		
BH08	0.15-0.2		1.00	x	x	x	x		
BH08	0.4-0.45		1.00		x	x	x		
BH09	0.0-0.1		1.00		x	x	x		
BH09	0.2-0.25								x
SS01	0.00		1.00		x				
ASSBH04	0.1-0.2	110 Carrs Drive - Site coverage	1.00		x	x			
ASSBH06	0.1-0.2	110 Carrs Drive - driveway	1.00		x	x			
ASSBH06	0.6-0.8		1.00		x				
ASSBH10	0.25	120 Carrs Drive - Site coverage	1.00		x				
ASSBH13	0.1-0.2		1.00		x	x			
SED01	0.00	Stream	1.00	x	x	x	x		
Number of analyses			*22*	*9*	*22*	*17*	*13*	*4*	*3*

Table 2: Summary Soil Analytical for Metals (mg/kg)

Sample location	Depth (m)	Location	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
LORs			*2*	*0.4*	*2*	*5*	*5*	*0.1*	*2*	*5*
Analytical										
BH01	0.0-0.1	Shed 2	3.1	nd	11	nd	6.2	nd	< 5	54
BH02	0.0-0.1	Shed 2	2.3	< 0.5	8.2	5.4	nd	nd	< 5	11
BH03	0.0-0.1	Shed 2	5.1	nd	11	6.2	8.6	nd	5.8	17
BH04	0.1-0.2	110 Carrs Drive -road	2.4	< 0.5	8.3	nd	8.7	nd	< 5	20
BH04	0.3-0.35	110 Carrs Drive -road	2.9	< 0.5	9.6	nd	10	nd	< 5	18
BH05	0.0-0.1	Northern structures - waste	14	nd	24	15	53	nd	6.5	220
BH06	0.0-0.1	Northern structures - shed	15	< 0.5	27	17	75	nd	6.7	290
BH06	0.3-0.4	Northern structures - shed	nd	< 0.5	< 5	nd	nd	nd	< 5	9.2
BH07	0.0-0.1	Northern structures - former dwelling	5.9	< 0.5	27	38	**900**	nd	13	420
BH07	0.15-0.25	Northern structures - former dwelling	6.3	< 0.5	20	17	150	nd	7.4	190
BH07	0.3-0.35	Northern structures - former dwelling	nd	< 0.5	6.2	nd	5.4	nd	< 5	12
BH08	0.0-0.1	Oil drum near Shed 1	8.7	nd	24	15	27	nd	13	140
BH08	0.15-0.2	Oil drum near Shed 1	11	nd	27	7.7	12	nd	10	55
BH08	0.4-0.45	Oil drum near Shed 1	nd	< 0.5	< 5	nd	nd	nd	< 5	9.8
BH09	0.0-0.1	120 Carrs Drive- within Shed 1	7.3	< 0.5	16	9.3	11	nd	11	38
SS01	0.00	120 Carrs Drive- within Shed 1	8.6	< 0.5	18	18	22	0.1	18	170
SED01	0.00	Creek sediment	15	nd	10	23	9.9	nd	10	57
ASSBH04	0.1-0.2	110 Carrs Drive -road	4.9	< 0.5	20	9.8	9.4	nd	14	28
ASSBH06	0.1-0.2	110 Carrs Drive - site coverage	6.9	< 0.5	17	7.8	13	nd	8	17
ASSBH06	0.6-0.8	110 Carrs Drive - site coverage	4.8	< 0.5	14	nd	6.4	nd	< 5	14
ASSBH10	0.25	120 Carrs Drive - site coverage	3.4	< 0.5	11	nd	nd	nd	< 5	10
ASSBH13	0.1-0.2	120 Carrs Drive - site coverage	12	< 0.5	19	6.5	9.7	nd	8	19

Table 2: Summary Soil Analytical for Metals (mg/kg)

Sample location	Depth (m)	Location	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
LORs			*2*	*0.4*	*2*	*5*	*5*	*0.1*	*2*	*5*
Statistics										
Number of samples			22	22	22	22	22	22	22	22
Number of detects			19	0	20	14	18	1	13	22
Percentage non detects			14%	100%	9%	36%	18%	95%	41%	0%
Maximum			15	-	27	38	**900**	-	18	420
Third quartile			10	-	21	17	26	-	13	119
Arithmetic average			7	-	16	14	74	-	10	83
Median value			6	-	17	12	11	-	10	24
First quartile			4	-	11	8	9	-	7	15
Minimum			2	-	6	5	5	-	6	9
Standard deviation			4	-	7	9	209	-	4	111
Coefficient of variation			1	-	0	1	3	-	0	1
Relative standard deviation			1	-	0	1	3	-	0	1
Margin of error			2	-	3	4	93	-	2	49
Maximum probable error			0	-	0	0	1	-	0	1
Criteria										
Residential, HIL-A			100	20	100	6,000	**300**	40	400	7,400
Residential, HIL-B			500	150	500	30,000	1,200	120	1,200	60,000
Parks/open space HIL-C			300	90	300	17,000	**600**	80	1,200	30,000
Commercial/industrial HIL-D			3,000	900	3,600	240,000	1,500	730	6,000	400,000
EILs - ACLs			160	-	660	190	1,800	-	600	290

Table 3: Summary Soil Analytical, Petroleum Compounds (mg/kg)

Sample location	Depth (m)	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX total	Naphthalene	C6 - C10 Fraction	F1 C6 - C10 TRHs minus BTEX	>C10 - C16 Fraction	F2 >C10 - C16 TRHs minus naphthalene	TRH >C10-C16 (after silica gel clean-up)	>C16 - C34 Fraction	TRH >C16-C34 (after silica gel clean-up)	>C34 - C40 Fraction	TRH >C34-C40 (after silica gel clean-up)	TRH >C10-C40 (total)	TRH >C10-C40 (total) (after silica-gel clean up)
LORs		*0.1*	*0.1*	*0.1*	*0.3*	*0.2*	*0.5*	*20*	*20*	*50*	*50*	*50*	*100*	*100*	*100*	*100*	*100*	*100*
Analytical																		
BH01	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH01	0.2-0.3	nd	nd	nd	nd	nd	-	-	-	-	-	nd	-	nd	-	nd	-	nd
BH02	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	260	-	140	-	400	-
BH03	0.0-0.1	nd	nd	nd	nd	nd	-	-	-	-	-	nd	-	nd	-	nd	-	nd
BH04	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
BH04	0.3-0.35	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	140	-	180	-	320	-
BH05	0.0-0.1	nd	nd	nd	nd	nd	-	-	-	-	-	nd	-	nd		nd	-	nd
BH06	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	220	-	120	-	340	-
BH06	0.3-0.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
BH07	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	110	-	nd	-	110	-
BH07	0.15-0.25	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
BH07	0.3-0.35	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
BH08	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	140	**140**	97	**46,000**	43,000	**4,100**	4,100	50,240	47,000
BH08	0.15-0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	**3,700**	3,200	310	300	4,010	3,500
BH08	0.4-0.45	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	**310**	-	130	-	440	-
BH09	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	110	-	nd	-	110	-
SED01	0.00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	100	nd	100	nd
SS01	0.00	nd	nd	nd	nd	nd	nd	nd	nd	62	62	-	**1,300**	-	780	-	2,142	-
ASSBH04	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	140	-	170	-	310	-
ASSBH06	0.6-0.8	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
ASSBH10	0.25	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
ASSBH13	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
ASSBH06	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	150	-	nd	-	150	-

Table 3: Summary Soil Analytical, Petroleum Compounds (mg/kg)

Sample location	Depth (m)	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX total	Naphthalene	C6 - C10 Fraction	F1 C6 - C10 TRHs minus BTEX	>C10 - C16 Fraction	F2 >C10 - C16 TRHs minus naphthalene	TRH >C10-C16 (after silica gel clean-up)	>C16 - C34 Fraction	TRH >C16-C34 (after silica gel clean-up)	>C34 - C40 Fraction	TRH >C34-C40 (after silica gel clean-up)	TRH >C10-C40 (total)	TRH >C10-C40 (total) (after silica-gel clean up)
LORs		*0.1*	*0.1*	*0.1*	*0.3*	*0.2*	*0.5*	*20*	*20*	*50*	*50*	*50*	*100*	*100*	*100*	*100*	*100*	*100*
Summary statistics																		
Number of samples		23	23	23	23	23	20	20	20	20	20	7	20	7	20	7	20	7
Number of detects		0	0	0	0	0	0	0	0	2	2	1	11	2	9	2	12	2
Percentage non detects		100%	100%	100%	100%	100%	100%	100%	100%	90%	90%	86%	45%	71%	55%	71%	40%	71%
Minimum		nd	nd	nd	nd	nd	nd	nd	nd	62	62	97	110	3,200	100	300	100	3,500
First quartile		-	-	-	-	-	-	-	-	82	82	97	140	13,150	130	1,250	140	14,375
Median value		-	-	-	-	-	-	-	-	101	101	97	220	23,100	170	2,200	330	25,250
Third quartile		-	-	-	-	-	-	-	-	121	121	97	805	33,050	310	3,150	866	36,125
Maximum		-	-	-	-	-	-	-	-	140	140	97	**46,000**	43,000	**4,100**	4,100	50,240	47,000
Arithmetic average		-	-	-	-	-	-	-	-	101	101	97	**4,767**	23,100	670	2,200	4,889	25,250
Standard deviation		-	-	-	-	-	-	-	-	55	55	-	**13,717**	28,143	1,304	2,687	14,329	30,759
Coefficient of variation (RSD)		-	-	-	-	-	-	-	-	1	1	-	3	1	2	1	3	1
Criteria																		
Residential, sand 0 - < 1 m		0.5	160	55	40	-	3	-	45	-	**110**	-	-	-	-	-	-	-
Residential, sand 1 - < 2 m		0.5	220	no limit	60	-	no limit	-	70	-	240	-	-	-	-	-	-	-
Residential, sand 2 - < 4 m		0.5	310	no limit	95	-	no limit	-	110	-	440	-	-	-	-	-	-	-
Residential, sand 4+ m		0.5	540	no limit	170	-	no limit	-	200	-	no limit	-	-	-	-	-	-	-
EIL, coarse grained		50	85	70	105	-	170	-	180	120	-	-	**300**	-	**2,800**	-	-	-
Management limits, coarse		-	-	-	-	-	-	700	-	1,000	-	-	**2,500**	-	10,000		-	

See table notes at end.

Table 4: Soil Analytical Summary, Polycyclic Aromatic Hydrocarbons in Soil (mg/kg)

Sample location	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b&j)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Total PAHs (sum)	B(a)P TEQ (upper bound)
LORs		*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	-	-
Analytical																			
BH01	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH04	0.1-0.2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1.2
BH04	0.3-0.35	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH06	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH06	0.3-0.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH07	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH07	0.15-0.25	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH07	0.3-0.35	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH08	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH08	0.15-0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH08	0.4-0.45	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH09	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
SED01	0.00	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Summary statistics																			
Number of samples		13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Number of detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage non detects		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Minimum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
First quartile		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Median value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Third quartile		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maximum		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Arithmetic average		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coefficient of variation (RSD)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Criteria																			
Residential, access HIL-A		3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	3
Residential, no access HIL-B		3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	4
Ecological (EIL, ESL)		170	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-
Toxicity equivalent factor		-	-	-	-	-	-	-	-	0.1	0.01	0.1	0.1	1	0.1	1	0.01	-	-
TEF x maximum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

See table notes at end.

Table 5: Soil Analytical Summary, OCPs and OPPs (mg/kg)

Sample	Depth (m)	Aldrin and Dieldrin	Cis + trans - chlordane	Heptachlor	4.4`-DDE	4.4`-DDD	4.4`-DDT	Total OCPs*	OPPs*
LORs		*0.05*	*0.1*	*0.05*	*0.05*	*0.05*	*0.05*	*-*	*0.05-0.2*
Analytical									
BH01	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd
BH03	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd
BH04	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd
BH04	0.3-0.35	nd	nd	nd	nd	nd	nd	nd	nd
BH06	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd
BH06	0.3-0.4	nd	nd	nd	nd	nd	nd	nd	nd
BH07	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd
BH07	0.15-0.25	nd	nd	nd	nd	nd	nd	nd	nd
BH07	0.3-0.35	nd	nd	nd	nd	nd	nd	nd	nd
BH08	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd
BH08	0.15-0.2	nd	nd	nd	nd	nd	nd	nd	nd
BH08	0.4-0.45	nd	nd	nd	nd	nd	nd	nd	nd
BH09	0.0-0.1	nd	nd	nd	nd	nd	nd	nd	nd
SED01	0.00	nd	nd	nd	nd	nd	nd	nd	nd
ASSBH04	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd
ASSBH13	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd
ASSBH06	0.1-0.2	nd	nd	nd	nd	nd	nd	nd	nd
Summary statistics									
Number of samples		17	17	17	17	17	17	17	17
Number of detects		0	0	0	0	0	0	0	0
Percentage non detects		100%	100%	100%	100%	100%	100%	100%	100%
Minimum		nd	nd	nd	nd	nd	nd	nd	nd
First quartile		-	-	-	-	-	-	-	-
Median value		-	-	-	-	-	-	-	-
Third quartile		-	-	-	-	-	-	-	-
Maximum		-	-	-	-	-	-	-	-
Arithmetic average		-	-	-	-	-	-	-	-
Standard deviation		-	-	-	-	-	-	-	-
Coefficient of variation (RSD)		-	-	-	-	-	-	-	-
Criteria									
Residential, HIL-A		6	50	6	240			-	-

See table notes at end of section

Table 6: Summary Soil Analytical for Metals (mg/kg)
2021 and 2022 investigations

Sample location	Depth (m)	Investigation	Location	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
LORs				*2*	*0.4*	*2*	*5*	*5*	*0.1*	*2*	*5*
Analytical											
120 Carrs Drive - residential property											
HA03	0.0-0.1	2021	Oil drum near Shed 1	11	nd	28	9.2	16	nd	12	67
HA03	0.2-0.3	2021	Oil drum near Shed 1	2.5	nd	7.9	nd	nd	nd	nd	5.4
BH08	0.0-0.1	2022	Oil drum near Shed 1	8.7	nd	24	15	27	nd	13	140
BH08	0.15-0.2	2022	Oil drum near Shed 1	11	nd	27	7.7	12	nd	10	55
BH08	0.4-0.45	2022	Oil drum near Shed 1	nd	< 0.5	< 5	nd	nd	nd	< 5	9.8
BH09	0.0-0.1	2022	120 Carrs Drive- within Shed 1	7.3	< 0.5	16	9.3	11	nd	11	38
SS01	0.00	2022	120 Carrs Drive- within Shed 1	8.6	< 0.5	18	18	22	0.1	18	170
HA01	0.1	2021	Timber stockpile near 120 Carrs Drive house	9.9	nd	25	17	20	nd	13	58
HA02	0.1	2021	Grassed undisturbed area behind 120 Carrs Drive house	15	nd	25	13	20	nd	13	49
ASSBH10	0.25	2022	120 Carrs Drive - site coverage	3.4	< 0.5	11	nd	nd	nd	< 5	10
ASSBH13	0.1-0.2	2022	120 Carrs Drive - site coverage	12	< 0.5	19	6.5	9.7	nd	8	19
Shed 2 structures											
BH01	0.0-0.1	2022	Sheds 2 - directly adjacent to IBC	3.1	nd	11	nd	6.2	nd	< 5	54
BH02	0.0-0.1	2022	Sheds 2 - near workbench	2.3	< 0.5	8.2	5.4	nd	nd	< 5	11
BH03	0.0-0.1	2022	Sheds 2 - grass/broad coverage	5.1	nd	11	6.2	8.6	nd	5.8	17
HA04	0.1-0.2	2021	Sheds 2 - directly adjacent to IBC	2	nd	9.2	6.8	6.5	nd	nd	46
HA05	0.0-0.1	2021	Shed 2, grass/broad coverage	11	nd	19	9.5	14	nd	9	28
SS1	0	2021	Shed 2, grass/broad coverage	7.2	nd	22	11	14	nd	13	21
Northern structures											
BH05	0.0-0.1	2022	Northern structures - waste	14	nd	24	15	53	nd	6.5	220
BH06	0.0-0.1	2022	Northern structures - shed	15	< 0.5	27	17	75	nd	6.7	290
BH06	0.3-0.4	2022	Northern structures - shed	nd	< 0.5	< 5	nd	nd	nd	< 5	9.2
BH07	0.0-0.1	2022	Next to the concrete slab of the former residential dwelling	5.9	< 0.5	27	38	**900**	nd	13	420
BH07	0.15-0.25	2022	Next to the concrete slab of the former residential dwelling	6.3	< 0.5	20	17	150	nd	7.4	190
BH07	0.3-0.35	2022	Next to the concrete slab of the former residential dwelling	nd	< 0.5	6.2	nd	5.4	nd	< 5	12
HA06	0.1	2021	Next to the concrete slab of the former residential dwelling	11	nd	29	230	140	nd	15	410
HA06	0.2-0.3	2021	Next to the concrete slab of the former residential dwelling	9.5	nd	27	33	64	nd	12	120
HA07	0.0-0.1	2021	Next to the concrete slab of the former residential dwelling	5.5	nd	20	46	190	nd	12	290

Table 6: Summary Soil Analytical for Metals (mg/kg)
2021 and 2022 investigations

Sample location	Depth (m)	Investigation	Location	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
LORs				*2*	*0.4*	*2*	*5*	*5*	*0.1*	*2*	*5*
Creek											
SED01	0.00	2022	Creek	15	nd	10	23	9.9	nd	10	57
110 Carrs Drive											
BH04	0.1-0.2	2022	110 Carrs drive -road	2.4	< 0.5	8.3	nd	8.7	nd	< 5	20
BH04	0.3-0.35	2022	110 Carrs drive -road	2.9	< 0.5	9.6	nd	10	nd	< 5	18
ASSBH04	0.1-0.2	2022	110 Carrs Drive - site coverage	4.9	< 0.5	20	9.8	9.4	nd	14	28
ASSBH06	0.1-0.2	2022	110 Carrs Drive - site coverage	6.9	< 0.5	17	7.8	13	nd	8	17
ASSBH06	0.6-0.8	2022	110 Carrs Drive - site coverage	4.8	< 0.5	14	nd	6.4	nd	< 5	14
Statistics											
Number of samples				32	32	32	32	32	32	32	32
Number of detects				29	0	30	23	27	1	21	32
Percentage non detects				9%	100%	6%	28%	16%	97%	34%	0%
Maximum				15	-	29	230	**900**	-	18	420
Third quartile				11	-	25	18	40	-	13	125
Arithmetic average				8	-	18	25	67	-	11	91
Median value				7	-	19	13	14	-	12	42
First quartile				5	-	11	9	10	-	8	17
Minimum				2	-	6	5	5	-	6	5
Standard deviation				4	-	7	46	173	-	3	117
Coefficient of variation				1	-	0	2	3	-	0	1
Relative standard deviation				1	-	0	2	3	-	0	1
Margin of error				2	-	3	17	63	-	1	42
Maximum probable error				0	-	0	1	1	-	0	0
Criteria											
Residential, HIL-A				100	20	100	6,000	**300**	40	400	7,400
Residential, HIL-B				500	150	500	30,000	1,200	120	1,200	60,000
Parks/open space HIL-C				300	90	300	17,000	600	80	1,200	30,000
Commercial/industrial HIL-D				3,000	900	3,600	240,000	1,500	730	6,000	400,000
EILs - ACLs				160	-	660	190	1,800	-	600	290

Table 7: Summary Soil Analytical, Petroleum Compounds (mg/kg)
2021 and 2022 investigations

Sample location	Depth (m)	Investigation	Location	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX total	Naphthalene	C6 - C10 Fraction	F1 C6 - C10 TRHs minus BTEX	>C10 - C16 Fraction	F2 >C10 - C16 TRHs minus naphthalene	TRH >C10-C16 (after silica gel clean-up)	>C16 - C34 Fraction	TRH >C16-C34 (after silica gel clean-up)	>C34 - C40 Fraction	TRH >C34-C40 (after silica gel clean-up)	TRH >C10-C40 (total)*	TRH >C10-C40 (total) (after silica-gel clean up)*
				0.1	*0.1*	*0.1*	*0.3*	*0.2*	*0.5*	*20*	*20*	*50*	*50*	*50*	*100*	*100*	*100*	*100*	*100*	*100*
Analytical																				
120 Carrs Drive - residential property																				
HA03	0.0-0.1	2021	Oil drum near Shed 1	nd	nd	nd	nd	nd	nd	nd	nd	58	58	-	**5,300**	-	790	-	-	-
HA03	0.2-0.3	2021	Oil drum near Shed 1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
BH08	0.0-0.1	2022	Oil drum near Shed 1	nd	nd	nd	nd	nd	nd	nd	nd	140	**140**	97	46,000	43,000	4,100	4,100	50,240	47,000
BH08	0.15-0.2	2022	Oil drum near Shed 1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	3,700	3,200	310	300	4,010	3,500
BH08	0.4-0.45	2022	Oil drum near Shed 1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	310	-	130	-	440	-
BH09	0.0-0.1	2022	120 Carrs Drive- within Shed 1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	110	-	nd	-	110	-
SS01	0.00	2022	120 Carrs Drive- within Shed 1	nd	nd	nd	nd	nd	nd	nd	nd	62	62	-	1,300	-	780	-	2,142	-
HA01	0.1	2021	Timber stockpile near 120 Carrs Drive house	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
HA02	0.1	2021	Grassed undisturbed area behind 120 Carrs Drive house	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
ASSBH10	0.25	2022	120 Carrs Drive - site coverage	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
ASSBH13	0.1-0.2	2022	120 Carrs Drive - site coverage	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
Shed 2 structures																				
BH01	0.0-0.1	2022	Sheds 2 - directly adjacent to IBC	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH01	0.2-0.3	2022	Sheds 2 - directly adjacent to IBC	nd	nd	nd	nd	nd	-	-	-	-	-	nd	-	nd	-	nd	-	nd
BH02	0.0-0.1	2022	Sheds 2 - near workbench	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	260	-	140	-	400	-
BH03	0.0-0.1	2022	Sheds 2 - grass/broad coverage	nd	nd	nd	nd	nd	-	-	-	-	-	nd	-	nd	-	nd	-	nd
HA04	0.1-0.2	2021	Sheds 2 - directly adjacent to IBC	nd	nd	nd	nd	nd	nd	nd	nd	57	57	-	130	-	nd	-	-	-
HA05	0.0-0.1	2021	Shed 2, grass/broad coverage	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
SS1	0	2021	Shed 2, grass/broad coverage	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
Northern structures																				
BH05	0.0-0.1	2022	Northern structures - waste	nd	nd	nd	nd	nd	-	-	-	-	-	nd	-	nd	-	nd	-	nd
BH06	0.0-0.1	2022	Northern structures - shed	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	220	-	120	-	340	-
BH06	0.3-0.4	2022	Northern structures - shed	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
BH07	0.0-0.1	2022	Next to concrete slab of former residential dwelling	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	110	-	nd	-	110	-
BH07	0.15-0.25	2022	Next to concrete slab of former residential dwelling	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
BH07	0.3-0.35	2022	Next to concrete slab of former residential dwelling	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
HA06	0.1	2021	Next to concrete slab of former residential dwelling	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
HA06	0.2-0.3	2021	Next to concrete slab of former residential dwelling	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
HA07	0.0-0.1	2021	Next to concrete slab of former residential dwelling	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	-	-
Creek																				
SED01	0.00	2022	Creek	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	100	nd	100	nd
110 Carrs Drive																				
BH04	0.1-0.2	2022	110 Carrs drive -road	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
BH04	0.3-0.35	2022	110 Carrs drive -road	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	140	-	180	-	320	-
ASSBH04	0.1-0.2	2022	110 Carrs Drive - site coverage	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	140	-	170	-	310	-
ASSBH06	0.6-0.8	2022	110 Carrs Drive - site coverage	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	nd	-	nd	-
ASSBH06	0.1-0.2	2022	110 Carrs Drive - site coverage	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	150	-	nd	-	150	-

Table 7: Summary Soil Analytical, Petroleum Compounds (mg/kg)
2021 and 2022 investigations

Sample location	Depth (m)	Investigation	Location	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX total	Naphthalene	C6 - C10 Fraction	F1 C6 - C10 TRHs minus BTEX	>C10 - C16 Fraction	F2 >C10 - C16 TRHs minus naphthalene	TRH >C10-C16 (after silica gel clean-up)	>C16 - C34 Fraction	TRH >C16-C34 (after silica gel clean-up)	>C34 - C40 Fraction	TRH >C34-C40 (after silica gel clean-up)	TRH >C10-C40 (total)*	TRH >C10-C40 (total) (after silica-gel clean up)*
				0.1	*0.1*	*0.1*	*0.3*	*0.2*	*0.5*	*20*	*20*	*50*	*50*	*50*	*100*	*100*	*100*	*100*	*100*	*100*
Statistics																				
Number of samples				33	33	33	33	33	30	30	30	30	30	7	31	7	30	7	22	7
Number of detects				0	0	0	0	0	0	0	0	4	4	1	13	2	10	2	12	2
Percentage non detects				100%	100%	100%	100%	100%	100%	100%	100%	87%	87%	86%	58%	71%	67%	71%	45%	71%
Minimum				nd	nd	nd	nd	nd	nd	nd	nd	140	140	97	46,000	43,000	4,100	4,100	50,240	47,000
First quartile				-	-	-	-	-	-	-	-	82	82	-	1,300	33,050	663	3,150	866	36,125
Median value				-	-	-	-	-	-	-	-	79	79	-	4,452	23,100	682	2,200	4,889	25,250
Third quartile				-	-	-	-	-	-	-	-	60	60	-	220	23,100	175	2,200	330	25,250
Maximum				-	-	-	-	-	-	-	-	58	58	-	140	13,150	133	1,250	140	14,375
Arithmetic average				-	-	-	-	-	-	-	-	57	57	-	110	3,200	100	300	100	3,500
Standard deviation				-	-	-	-	-	-	-	-	41	41	-	12,590	28,143	1,230	2,687	14,329	30,759
Coefficient of variation (RSD)				-	-	-	-	-	-	-	-	1	1	-	3	1	2	1	3	1
Criteria																				
Residential, sand 0 - < 1 m				0.5	160	55	40	-	3	-	45	-	**110**	-	-	-	-	-	-	-
Residential, sand 1 - < 2 m				0.5	220	no limit	60	-	no limit	-	70	-	240	-	-	-	-	-	-	-
Residential, sand 2 - < 4 m				0.5	310	no limit	95	-	no limit	-	110	-	440	-	-	-	-	-	-	-
Residential, sand 4+ m				0.5	540	no limit	170	-	no limit	-	200	-	no limit	-	-	-	-	-	-	-
EIL, coarse grained				50	85	70	105	-	170	-	180	120	-	-	**300**	-	**2,800**	-	-	-
Management limits, coarse				-	-	-	-	-	-	700	-	1,000	-	-	**2,500**	-	10,000	-	-	-

See table notes at end.

Table Notes

LOR = limits of reporting. (x) LOR for multiple analytes within a category.

nd = non detect at LOR. < x = raised or specific LOR.

- = not analysed, no criteria, not relevant.

Bold value / bolded criteria = value exceeds criteria.

Underlined value / underlined criteria = value exceeds criteria.

TRHs = total recoverable hydrocarbons. PAHs = polycyclic aromatic hydrocarbons.
OCPs = organochlorine pesticides. OPPs = organophosphate pesticides. PCBs = polycyclic biphenyls.

Statistics:
Quartiles are used to break up the data set into four equal parts, providing an indication of the distribution and variance of the data. When observations are ordered in ascending order according to their values:
- the first or lower quartile Q1, is the value of the observation at or below which one-quarter (25%) of observations lie, and is the 25th percentile;
- the second quartile Q2, is the median value at or below which half (50%) of observations lie, and is the 50th percentile; and
- the third or upper quartile Q3, is the value of the observation at or below which three-quarters (75%) of the observations lie, and is the 75th percentile.

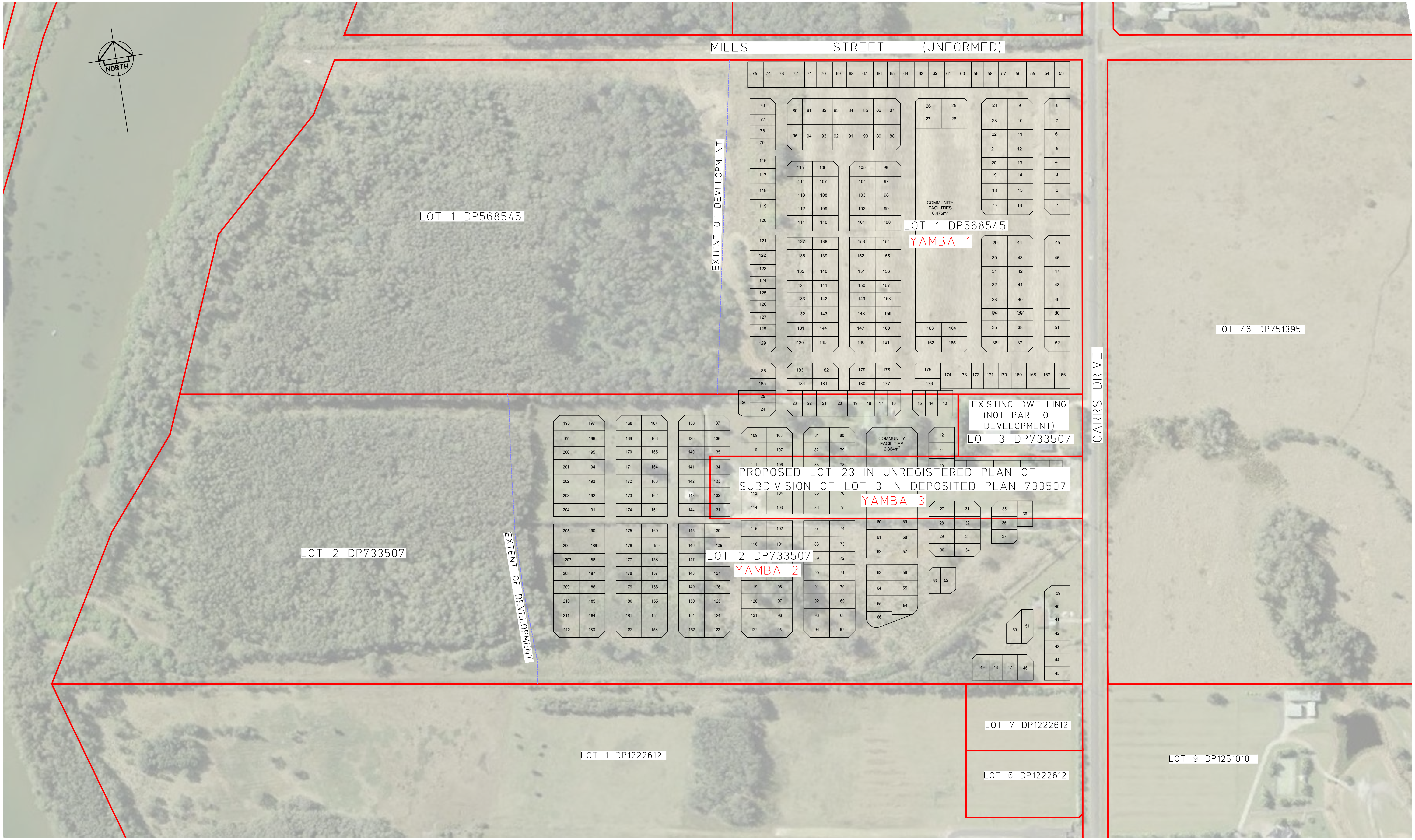
Coefficient of variation (CV) is a measure of the relative homogeneity of a distribution ($CV = s/\bar{x}$). Low CV values (≤ 0.5) indicating a fairly homogenous contaminant distribution, and high CV values (> 1) indicating heterogenous distributions and probably skewed to the right. Also known as the relative standard deviation (RSD) and expressed as %.

Soil criteria from:

Human health and ecological criteria from National Environment Protection Council (NEPC) (2013) *Schedule B1, Guideline on Investigation Levels for Soil and Groundwater* , from the *National Environment Protection (Assessment of Site Contamination) Measure 1999* , including *Amendment Measure 2013 (No. 1)* (ASC NEPM).

Appendix A

Proposed development – concept plan



30 15 0 30 60 90
Horizontal Scale 1:1500 (A1)
1:3000 (A3)

YAMBA 1:
LOT LAYOUT AS PER MASTERPLAN REV 16
TOTAL LOT YIELD 185

YAMBA 2 & 3:
LOT LAYOUT AS PER CONCEPT PLAN OPTION 3 REV 2
TOTAL LOTS YIELD 212

PLANS TO BE PRINTED IN COLOUR

PRELIMINARY FOR SITE PLANNING PURPOSES ONLY
NOT FOR CONSTRUCTION

NO ACCURACY SHOULD BE PLACED ON AERIAL IMAGE. AERIAL IMAGE IS FOR VISUAL PURPOSES ONLY

ISSUE	DESCRIPTION	DATE
3	MASTERPLAN LAYOUT OVERLAY ON AERIAL IMAGE YAMBA 1 & 2	02.12.2021
2	MASTERPLAN LAYOUT RE-ISSUED FOR CLIENT REVIEW	18.08.2021
1	MASTERPLAN LAYOUT RE-ISSUED FOR CLIENT REVIEW	23.07.2021
0	MASTERPLAN LAYOUT ISSUED FOR CLIENT REVIEW	28.06.2021

DESIGNED: T.RYDEN
DATE: DECEMBER 2021
DRAWN: A.SCHMID
SCALE: AS SHOWN
SURVEYING:
SHEET SIZE: A1

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
PROPOSED MANUFACTURED
HOUSING ESTATE

PROJECT
CARRS DRIVE
YAMBA NSW
LOT 2 DP733507

CIVIL DRAWING
DRAWING TITLE:
SITE MASTERPLAN
YAMBA 1 & 2 OVER AERIAL IMAGE
DWG No: 01
SHEET: 1 OF 1
REV: 3

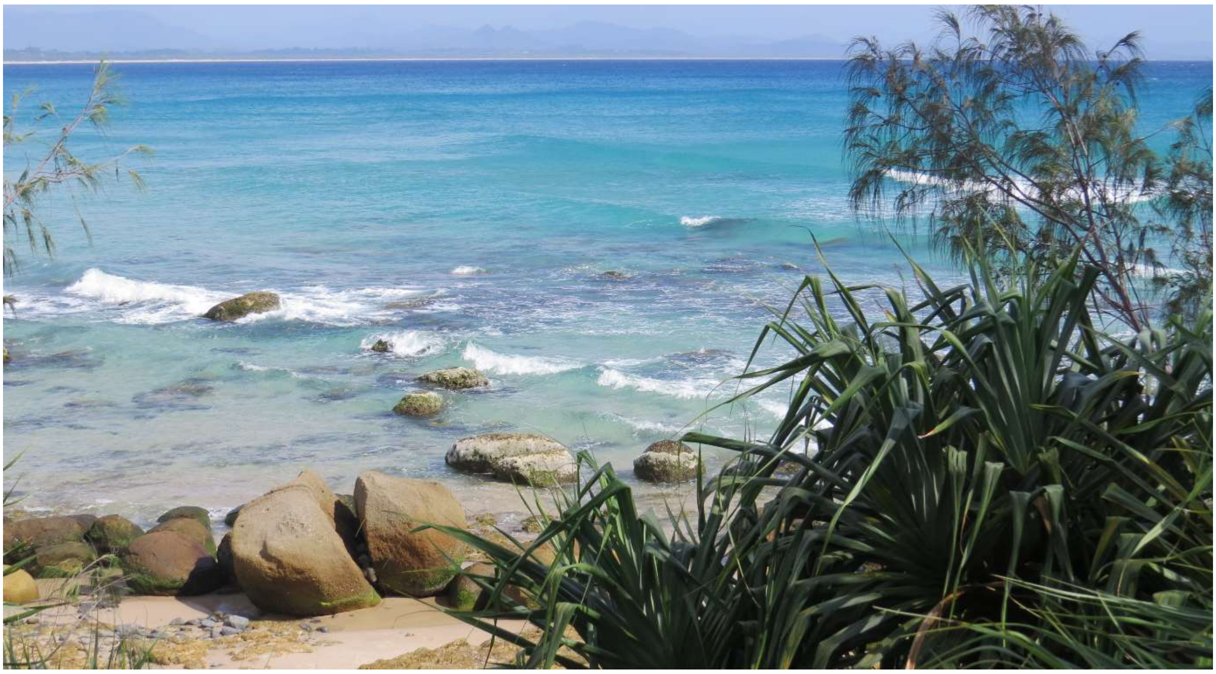
Appendix B

SAQP, including aerial Photographs and Before You Dig Plans

Sampling, Analysis and Quality Plan

110 – 120 Carrs Drive, Yamba NSW

July 2022, Ref. 21029.2



Easterly Point Environmental

www.easterlypoint.com

Report Details

The following report was commissioned by Clifton Yamba Land:

Sampling, Analysis and Quality Plan

110 and 120 Carrs Drive

Yamba NSW 2464

July 2022, Ref. 21029

This sampling plan was prepared in accordance with the scope of work described in Easterly Point Environmental's proposal and the associated conditions, for the sole use of Clifton Yamba Land, their agents and the relevant regulatory authorities, including a contaminated land site auditor if applicable. It is subject to the *Limitations to environmental information*, described in Section 1.4 of the report.

This document should not be used or copied by other parties without written authorisation from Easterly Point Environmental Pty Ltd.

Distribution:

Delivery	Status	Date	Recipient
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Hailey Spry (Murphy)
Principal Environmental Scientist
MEIANZ, CEnvP SCS

2022/2023
No. SC41182

2022/2023
No. 1053

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1.0 Introduction

Easterly Point was commissioned by Manage-Design-Engineer (MDE) on behalf of Clifton Yamba Land to conduct a preliminary site investigation (PSI) for a site located at 104 and 120 Carrs Drive, identified as Lot 2 DP 733507 and part of Lot 3 DP733507. This sampling, analysis and quality plan (SAQP) has been prepared to detail the proposed soil investigation at the above-mentioned property.

The scope of work was detailed in Easterly Point's proposal to Clifton Yamba Land on 17 May 2022, with their acceptance of the engagement confirmed on 23 June 2022. This SAQP was prepared in accordance with the scope of work described in Easterly Point's proposal and our *Standard Trading Conditions*, for the sole use of Clifton Yamba Land, their agents and the relevant regulatory and planning authorities, including a contaminated land site auditor if applicable. It is subject to the *Limitations to environmental information*, described in Section 1.4 of the report.

1.1 Background

The site is located at 110 – 120 Carrs Drive, Yamba and consists of approximately 17.6 ha of rural residential land. The site has primarily been used for cattle grazing, with some minor intensive agricultural activities undertaken in the 1960s and 1970s. A site history review and site inspection have identified various structures at the site, including a residential house fronting Carrs Drive, and a series of buildings/sheds in the north-eastern and central portions of the site.

Diagonally behind the house there is a second order stream, which is to be retained as part of the proposed development.

A cattle tick dip is understood to be located approximately 350 m from site, however given the nature of contaminants at these dips, and the distance to the site, impacts from the dip are not expected at the site.

An investigation of the 120 Carrs Drive site was undertaken by Easterly Point in June 2021, and various areas of concern were identified, with recommendations provided for further investigation.

Proposed development

It is understood that the land is proposed to be developed into a manufactured housing estate, with the developable area encompassing approximately 10 ha. The development is reported to include the importation of material to raise the site elevation by 1.2 – 2.0 m, with the majority of site utility services to be installed within the vertical extents of the imported fill. Localised excavation into natural soils at depths < 5 m AHD will be required for some utilities, e.g. sewer rising mains. The western portion of the site is not proposed to be disturbed during development, and as such, intrusive investigations in this area are not proposed.

As part of a pre-DA lodgement meeting with Clarence Valley Council (CVC), the meeting minutes[1] prepared by CVC included the following requirements, as relevant to this investigation:

- *State Environmental Planning Policy No. 55 – Remediation of Land*: a preliminary site investigation is required to be submitted with the application demonstrating the land is suitable for residential use; and

---

[1] Clarence Valley Council (30 August 2021) *Pre-DA lodgement Meeting*, (Ref. DMU2021/0032).

- Potential soil contamination: Due to the possible previous use of the land for agricultural/horticultural purposes it will need to be demonstrated that the site is suitable for its intended [use]; and

- Acid Sulfate Soils: The subject land is identified as containing Class 2 Acid Sulfate soils on the Acid Sulfate Soils Map and is therefore subject to the provisions of Clause 7.1. An ASS management report must be prepared for the development and submitted with the DA.

1.2 Objectives and scope

As per EPA (2020)[2], the overall objective of a PSI is to assess whether contamination has the potential to exist on the site and whether further investigation is needed.

The following scope of work is proposed:
- conduct a site history review;
- develop investigation design documents based on site history findings, supplemented by a review of available published information;
- complete a soil and sediment investigation across the site using a judgemental sampling program;
- collection of soil and sediment samples for analysis at a NATA accredited laboratory; and
- preparation of a report describing the results of the above investigations.

1.3 Standards and guidelines

Easterly point will refer to the appropriate standards, codes and guidelines relevant to the project and disciplines involved in carrying out the services, including but not limited to the following:

Guidelines made by the EPA are:
- EPA (1995) *Contaminated Sites: Sampling Design Guidelines*;
- EPA (2005) *Guidelines for assessing former orchids and market gardens*;
- EPA (2014) *Waste Classification Guidelines Part 1: Classifying waste*;
- EPA (2015) *Guidelines on the Duty to Report Contamination under the* Contaminated Land Management Act *1997*; and
- EPA (2017) *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd edition)*.
- EPA (2020) *Consultants reporting on contaminated land: contaminated land guidelines.*

Guidelines approved by the EPA are:
- National Environment Protection Council (NEPC) (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*, Schedule A and Schedules B(1) – B(9);

Technical notes made by the EPA are:
- EPA (2016) *Guidance Document: Designing Sampling Programs for Sites Potentially Contaminated by PFAS*.

1.4 Limitations to environmental information

The findings of this reporting are based on the objectives and scope of the services provided. Easterly Point Environmental 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 made.

---

[2] NSW EPA (2020) *Consultants reporting on contaminated land, Contaminated Land Guidelines*.

Easterly Point's review/assessment is strictly limited to identifying the environmental conditions associated with the subject property in regard to site contamination, and does not seek to provide an opinion regarding other aspects of the environment not related to site contamination, or to the suitability of the site in regard to:

- other aspects of the environment not related to site contamination; or
- hazardous building materials in buildings or structures; or
- structures, footings, infrastructure, and the like, whether above or below ground; or
- the suitability of fill materials for any use and any geotechnical considerations; or
- to the suitability of the site in regard to land use planning or legal use of the land; or
- regulatory responsibilities or obligations (for which a legal opinion should be sought); or
- the work health and safety (WHS) legislation; or
- the suitability of any engineering design.

Reviews of such information are only in relation to the contaminated land aspects of any project or site. If specialist technical review of such documents is required, these should be obtained by an appropriate technical or legal specialist.

The reporting and conclusions are based on the information obtained at the time of the assessments. Changes to the subsurface conditions may occur subsequent to the investigation described, through natural processes or through the intentional or accidental addition of contaminants, and these conditions may change with space and time.

Field monitoring, sampling and chemical analysis of environmental media and structures are based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate, based on regulatory requirements, site history, and the proposed land use, not on sampling and analysis of all media, at all locations, for all potential contaminants.

Limited field monitoring, and environmental sampling and laboratory analyses, were undertaken as part of the investigations reviewed or conducted by Easterly Point, as described. Ground conditions, contaminants, and material types/composition can vary between sampling locations, and this should be considered when extrapolating between sampling locations. Except at each sampling location, the nature, extent and concentration of contamination is inferred only.

Furthermore, the test methods used to characterise the contamination at each sampling location are subject to limitations and provide only an approximation of the contaminant concentrations. Monitoring and chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, 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 at the site should not be interpreted as a warranty or guarantee that such materials do not exist at the site. Therefore, future work at the site which involves subsurface excavation or removal of structures or parts thereof, should be conducted based on appropriate management plans. These should include, *inter alia*, environmental management plans, including unexpected findings protocols, hazardous building materials management plans, and work health and safety plans.

If additional certainty is required, then additional site history information should be obtained, or additional exploration and sampling and analysis should be conducted. This decision should be made by the user of this information based on an appropriate risk management process, and the user should commission additional services if required.

2.0 Site identification, environmental setting and site history summary

Information in this section has been summarised based on historical and desk-top searches conducted as part of the PSI, as well as a site inspection conducted by Easterly Point. Full site identification, environmental setting and history details will be presented in the PSI.

2.1 Site identification and land use

The site location is shown in Figure 1 and site layout is shown in Figure 2, attached. The site identification and land use details are:

Street address:	110 and 120 Carrs Drive, Yamba NSW 2464;
Property description:	Lot 32 DP1280863 and Lot 2 DP733507;
Property size:	17.6 ha (approximately), comprising: Lot 2 - 16.1 ha; and Lot 32 - 1.5 ha.
Local government area:	Clarence Valley Council;
Land use – existing:	Vacant;
Land use – proposed:	Residential – manufactured housing estate;
Zoning – existing:	R1: General residential – eastern portion; C3: Environmental management - western portion; and C2: Environmental management – far western portion along Oyster Channel.
Zoning – proposed:	As above.

2.2 Surrounding land use

The site is located in an area of mixed rural residential land use, approximately 3 km west of the town centre of Yamba. The surrounding land uses include:

North:	Rural property, proposed to be developed into a manufactured housing estate. Followed by rural land use, with St James Catholic Primary school located approximately 350 m to the north-east;
East:	Carrs Drive, with rural properties beyond, primarily grazing land;
South:	Rural property used for intensive agriculture (macadamia orchid); and
West:	Oyster Channel followed by rural properties.

2.3 Surrounding environment

The site is located in a predominantly rural area, with the western boundary of the site adjoining Oyster Channel. A second order stream traverses the site, entering the site from Oyster Channel and running parallel to the southern site boundary before crossing the eastern portion of the site. It does not appear that the stream has been historically re-aligned based on review of historical aerial photographs.

2.3.1 Environmental values

Environmental Values (EVs) have been developed for NSW rivers and estuaries, and provide guideline levels, known as water quality objectives (WQOs), to assist water quality planning and management. They are the agreed environmental values and long-term goals for NSW's surface waters, and set out:

- the community's values and uses for rivers, creeks, estuaries and lakes (i.e. healthy aquatic life, water suitable for recreational activities like swimming and boating, and drinking water); and
- a range of water quality indicators to help assess whether the current condition of our waterways supports those values and uses.

The numerical default criteria or trigger values to support the environmental values established by the water WQOs are included in ANZG (2018), ANZECC/ARMCANZ (2000) and NHMRC/NRMMC (2011).

The site is located within the Clarence River Catchment, with the Clarence River mouth located between the towns of Yamba and Iluka. NSW Department of Planning and Environment, Water in NSW[3], describes that the catchment area covers 22,716 km^2, and describes that key water management issues include:

> *Key issues include riverbank erosion, gully erosion, invasive weeds, fire management practices and acid sulphate soils.*
>
> *Due to a high density of rural settlement, the region's rivers and estuaries tend to be affected by changed run-off conditions caused by land clearing, agricultural use, human settlement and recreation. Many streams on the coastal floodplain have been straightened and channelled and sewage treatment plants discharge high volumes of nutrient rich water into the basin's river systems.*
>
> *Most of the rivers and creeks in the Clarence River basin are unregulated, with no major storages to capture and control flows. Most water users rely on natural flows or small structures, such as weirs, for their water supplies. As in most unregulated rivers, flows are most affected during relatively dry times, when water is low and demand high.*

---

[3] https://www.industry.nsw.gov.au/water/basins-catchments/snapshots/clarence#:~:text=The%20Clarence%20River%20catchment%20is,area%20of%2022%2C716%20square%20kilometres.

3.0 Environmental setting

The desktop study of the environment at and around the site is summarised, including published soils and geological information.

3.1 Local meteorology

A summary of the climatic data for Yamba Pilot Station, located approximately 5 km east of the site, is shown in Table 3.1. Yamba has a temperate climate, with a wet summer season and mild, drier winters. The temperatures are highest between December to March and coldest in the winter months of June to August, with the highest average rainfall occurring between February and May (Australian Bureau of Meteorology, 2020a).

Table 3.1: Climatic summary[1]

	Temperature ^{0}C [2]		Rainfall mm [3]		Average number of rain days [4]
	Mean minimum	Mean maximum	Mean monthly	Highest monthly	
January	20.3	26.8	139.5	478.9	12.5
February	20.4	26.8	163.2	612.4	13.8
March	19.3	26.1	191.6	728.8	16
April	16.5	24.3	160.4	629.4	13.5
May	13.3	21.8	153.9	753	12.5
June	10.9	19.7	135.9	548.4	10.7
July	9.8	19.1	100.3	707.5	9.2
August	10.5	20.2	75.2	559.8	8.1
September	13	22.1	58.8	227.3	8.5
October	15.5	23.4	79.6	370.7	9.8
November	17.5	24.7	92.3	330.4	10.3
December	19.2	26	117.7	385.2	11.4

Notes:
1. Data from the Bureau of Meteorology climate averages website for Yamba Pilot Station.
2. Temperature data collected from 1877 to 2022.
3. Rainfall data collected from 1877 to 2022.
4. Number of days in a calendar month with ≥1 mm of precipitation.

It is noted that in the months preceding the investigation, the region received higher-than normal rainfalls, with major flooding seen across the surrounding area. The total monthly rainfall observed at Yamba Pilot Station in February and March 2022 was 549 mm and 717.8 mm, respectively (Bureau of Meteorology climate averages website).

3.2 Topography and hydrology

Based on the 1:25,000 Yamba topographic map, the site is located at approximately 3 m Australian Height Datum (AHD), while a topographically low area follows the Oyster Channel tributary of the Clarence River, as it runs to the west of the site at 0 m AHD, as shown on Figure 3.1. The topography of the site is consistent with that of the surrounding land, remaining relatively flat throughout the site and town.

The site is predominantly flat and undeveloped with vegetation across the majority of the site. As such, direct infiltration to the subsurface is expected to be high.

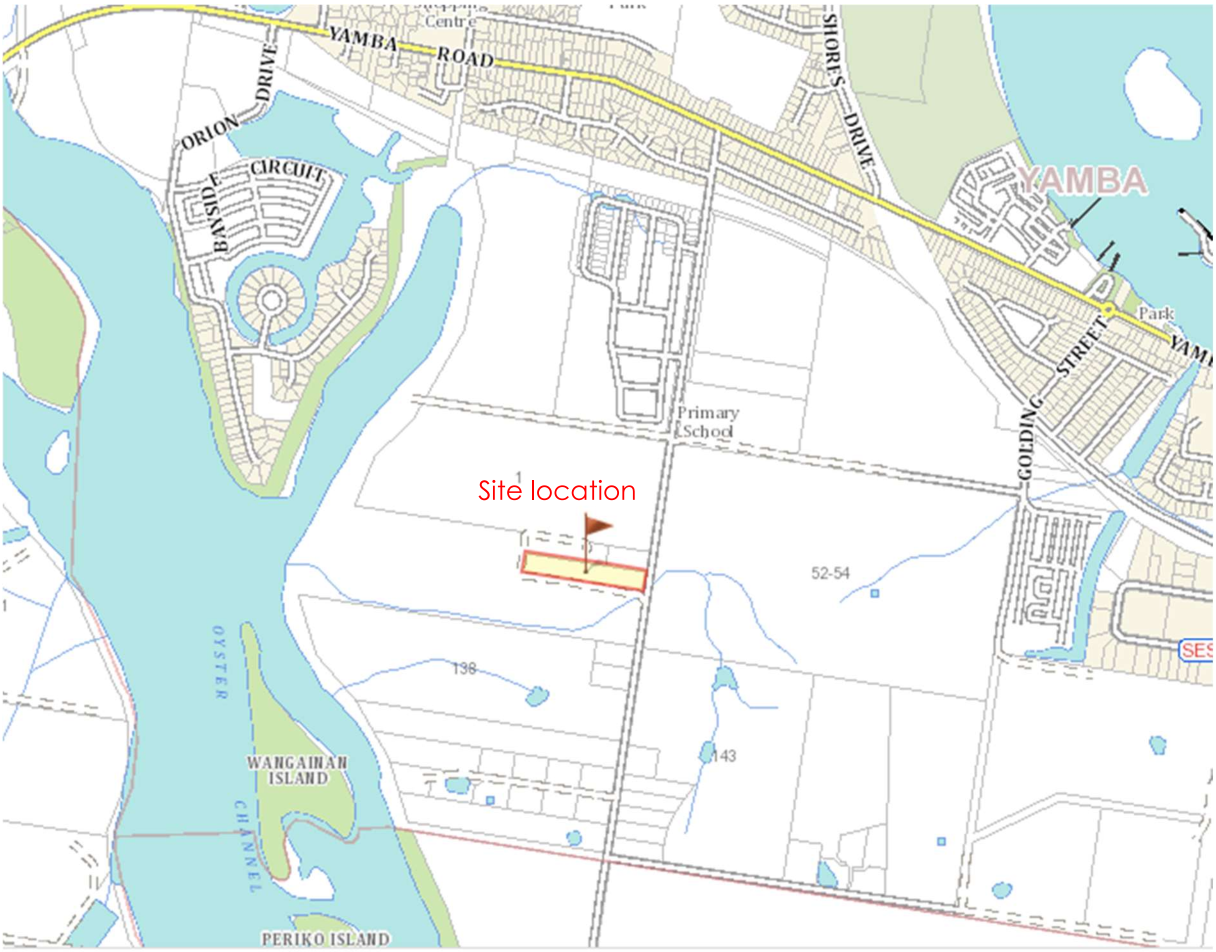


Figure 3.1: Topographic map of the site
Source: SIX maps, NSW Government

3.3 Geology and soils

3.3.1 Geology

The 1:100,000 *Grafton Area Coastal Quaternary Geology* Map indicates that the site is underlain by both:

- *Qhef* - Holocene tidal-delta flat: marine sand, silt, clay, shell, gravel; and
- *Qpef* - Pleistocene tidal-delta flat: marine sand, silt, minor clay, indurated sand, shell.

An extract of the map is shown below in Figure 3.2.

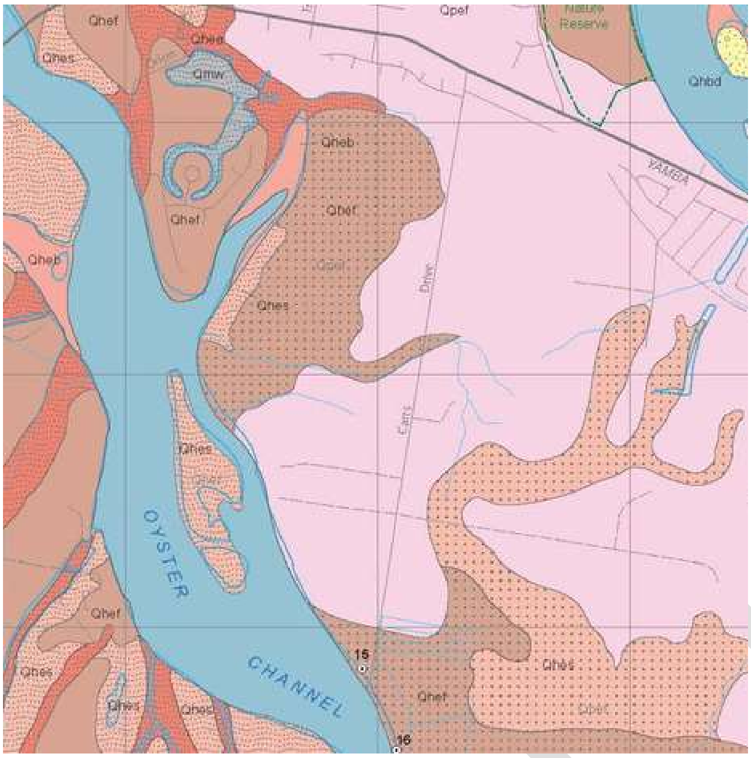


Figure 3.2: Geology sheet for site and surrounds
Grafton Area 1:100,000 Coastal Quaternary Geology Map

Refer to https://www.ga.gov.au/scientific-topics/energy/province-sedimentary-basin-geology/petroleum/onshore-australia/clarence-moreton-basin

Geoscince Australia describes the followign regardign the Clarence-Moreton Basin:

> *The Late Triassic to Late Jurassic Clarence-Moreton Basin is situated in southeast Queensland and northeast New South Wales and covers about 26 000km2 onshore and at least 1 000km2 offshore in water depths up to 90 metres. The basin and its precursors, the Esk Trough, Nymboida Basin and Ipswich Basin developed on a basement cut by major long-lived, dextral strike-slip faults (West Ipswich, Coraki and Coast Range Faults). Movement along these produced crustal transtension which was followed in the latest Triassic to Late Jurassic by a period of thermal relaxation and subsidence which formed the Basin.*
>
> *The Basin is subdivided into three main depocentres, the Logan, Laidley and Cecil Plains Sub-basins, with the much smaller Yamba Trough extending offshore from the eastern margin of the Logan Sub-basin. The Logan Sub-basin contains the greatest thickness of sediments with up to 3 000 metres of fluvial and lacustrine siliciclastics and coal with minor basaltic volcanics.*

According to the Grafton-Maclean 1:250,000 Geological Series Sheet (Geological Survey of NSW 2001), the site is underlain by early Jurassic aged sandstone with clays and ferrunginised fossil wood logs and fragments, Grafton Sandstone (*J-bgs*). In the area of Yamba, this geological unit is commonly overlain with Qx, Quaternary aged marine, barrier, and estuarine sediments, coastal plain sand deposits, organic swamp deposits, with veneer of Qa, Quarternay sand, silt, clay and gravel. See figure 3.3 below for an extract of this map showing site location.

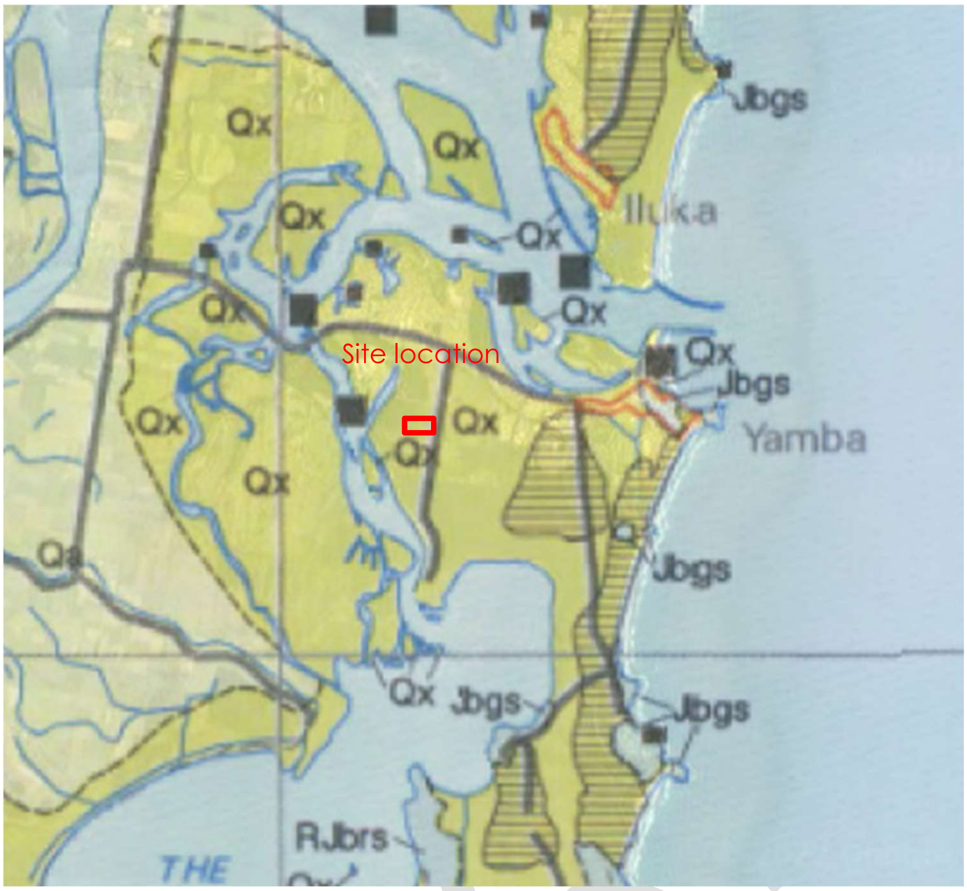


Figure 3.3: Geology sheet for site and surrounds
Grafton-Maclean 1:250,000 Geological Series Sheet

3.3.2 Soils

The soil landscape at the site is mapped on the Woodburn Sheet at 1:100,000 as *Iluka* (il) (Morand 2001a). This is described as "extremely low, level to gently undulating Quaternary (Holocene and Pleistocene) sand sheets. Low beach ridges are common on Holocene sand. Slopes 0 – 2 %; relief 1 – 3 m; elevation 1 – 5 m. Mix of cleared areas of open-forest and closed forest (littoral rainforest)". The soils are described as:

> *Iluka (il) – deep (>200 cm), well drained Aeric Podosols (Humus Podzols) and deep (>200 cm), poorly drained Aquic/Semiaquic Podosols (Humus Podzols). Deep (>200 cm), well-drained Sesquic Aeric Podosols (Podzols) within landscape variant ila.*
>
> *Qualities and Limitation – acid, highly erodible, non-cohesive, infertile soils with very low available water holding capacity and high permeability.*

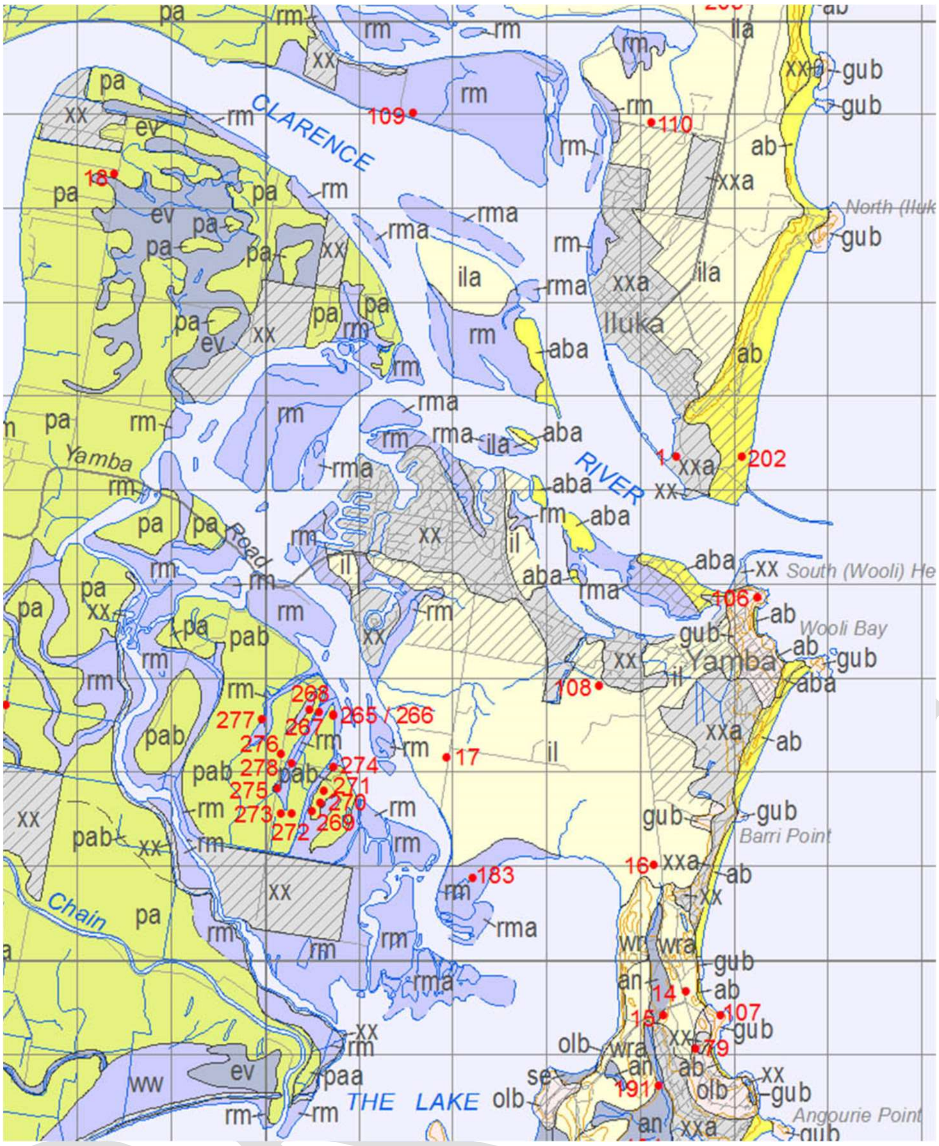
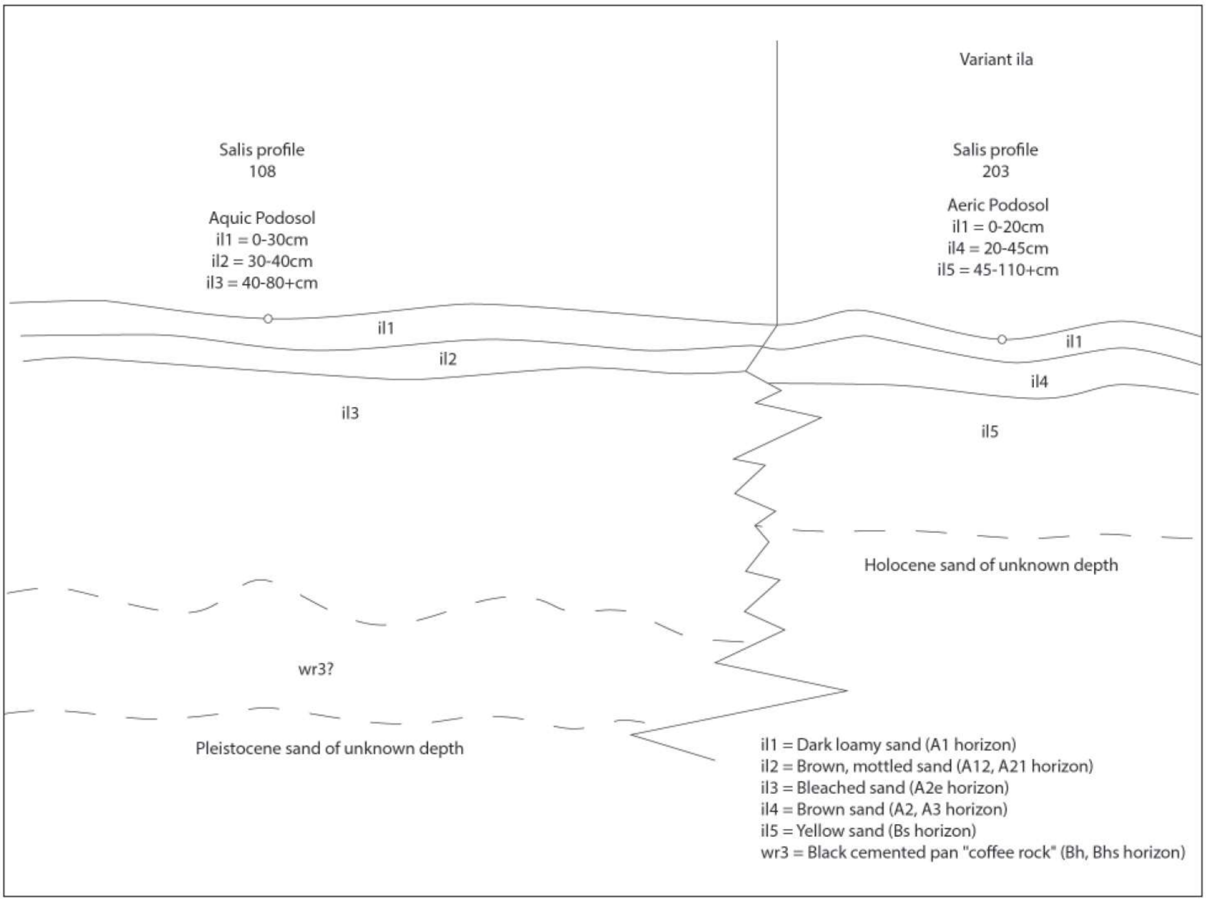


Figure 3.4: Soils sheet for site and surrounds

A schematic cross -section and summary of the Iluka soil landscape are shown in Figure 3.5, and Table 3.2, respectively.



- ***Distribution diagram of Iluka soil landscape illustrating occurrence and relationship of dominant soil materials.***

Figure 3.4: Schematic cross-section of Iluka soil landscape
Morland 2001b

Table 3.2: Iluka (il) soil landscape summary

Dominant soil materials		USCS class	Clay	Silt	Fine sand	Coarse sand	pH	Organic matter %	CEC me/100 g
Il1	Dark loamy sand (0 – 20 cm depth)	SM	11	5	41	43	4.0	3.54	4.7
Il1	Dark loamy sand (20 – 30 cm depth)	SM	11	3	47	39	4.2	1.1	3.8
Il2	Brown mottled sand	SM	5	2	39	54	4.3	0.3	2.3
Il3	Bleached sand	SM	2	0	30	68	4.8	0.08	0.5
Average		-	7.25	2.5	39.25	51	4.33	1.26	2.83

Notes:

- From Morand D.T. (2001b). SALIS profile 108.
- USCS class refers to soil material classifications based on the Unified Soil Classification System. CL = inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays; MH = inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic soils and CH = inorganic clays of high plasticity, fat clays.
- Fine earth particle size analysis of < 2 mm diameter, not including gravel. Clay < 0.002 mm, silt 0.002-0.02 mm, fine sand 0.02-0.2 mm, coarse sand 0.2-2 mm and gravel 2-60 mm.
- pH in pH units. The activity of the negative log of hydrogen ions in a suspension of 1:5 soil: 0.01M $CaCl_2$. 0.75 pH units are added to approximate pH in 1:5 soil:water.
- Organic matter in %. Soil organic matter = organic carbon x 1.755. Organic carbon by Walkey-Black method, which measures the amount of carbon in plant and animal remains including soil humus but not charcoal or coal. 0.5-1.0 very low, 1.0-2.0 low, 2.0-3.0 moderate, 3.0-5.0 high, and >5.0 very high. Used as an indicator of potential contamination retention, i.e. higher organic matter higher contaminant retention potential.
- Cation exchange capacity (CEC) in me/100 g. CEC is an indication of the number of exchange sites within a soil which may temporary hold positively charged ions. It is generally determined by the amount and type of clay and the amount of organic matter. <6 very low, 6-12 low, 12-25 moderate, 25-40 high, and > 40 very high. Used as an indicator of potential contamination retention, i.e. higher CEC higher contaminant retention potential.

3.3.3 Acid sulfate soils

Coastal acid sulfate soils are naturally occurring sediments deposited under estuarine conditions, which contain metal sulfides, formed by bacterial activity in waterlogged conditions when there is little available oxygen. In an undisturbed and waterlogged state, these soils may pose no or low risk (potential acid sulfate soils, PASS). However, when disturbed or exposed to oxygen, acid sulfate soils undergo oxidation, which produces sulfuric acid (acid sulfate soils, ASS). This can lead to soil scalding, death of fish and other aquatic organisms, habitat degradation and corrosion of infrastructure.

The subject land is identified as containing Class 2 Acid Sulfate soils on the Acid Sulfate Soils Map and is subject to the provisions of Clause 7.1. An ASS management report therefore must be prepared prior to the development of the site.

3.4 Hydrogeology

A search of licenced groundwater bores within an approximate 1 km radius of the site showed four groundwater bores, wells and/or excavations, which are summarised in Table 3.3 and shown in Figure 3.4. Lithology details were only provided for one of the wells, GW306249, describing sand, medium – coarse from 0 to 8 m depth.

Wells are located outside of the 1 km radius described similar lithology, generally as comprising sand (generally to 8 m) with some locations showing silty clay up to 4 m depth. All wells were listed as water supply/monitoring.

Table 3.3: Groundwater information from licence bores[1]

Well No.	Purpose	Installation date	Depth of bore (m)
GW306066	Water Supply	31/12/2000	5
GW306249	Water Supply	10/08/2007	8
GW303904	Water Supply	02/01/2003	5
GW305516	Water Supply	06/11/2002	6.5

Table notes:
1.Data collated from BOM (2022).

There is no known potable use of groundwater in the area, noting that NSW Health recommends groundwater is not used for drinking, cooking and personal hygiene (including cleaning teeth and bathing) without testing and appropriate treatment including disinfection (NSW Health 2019).

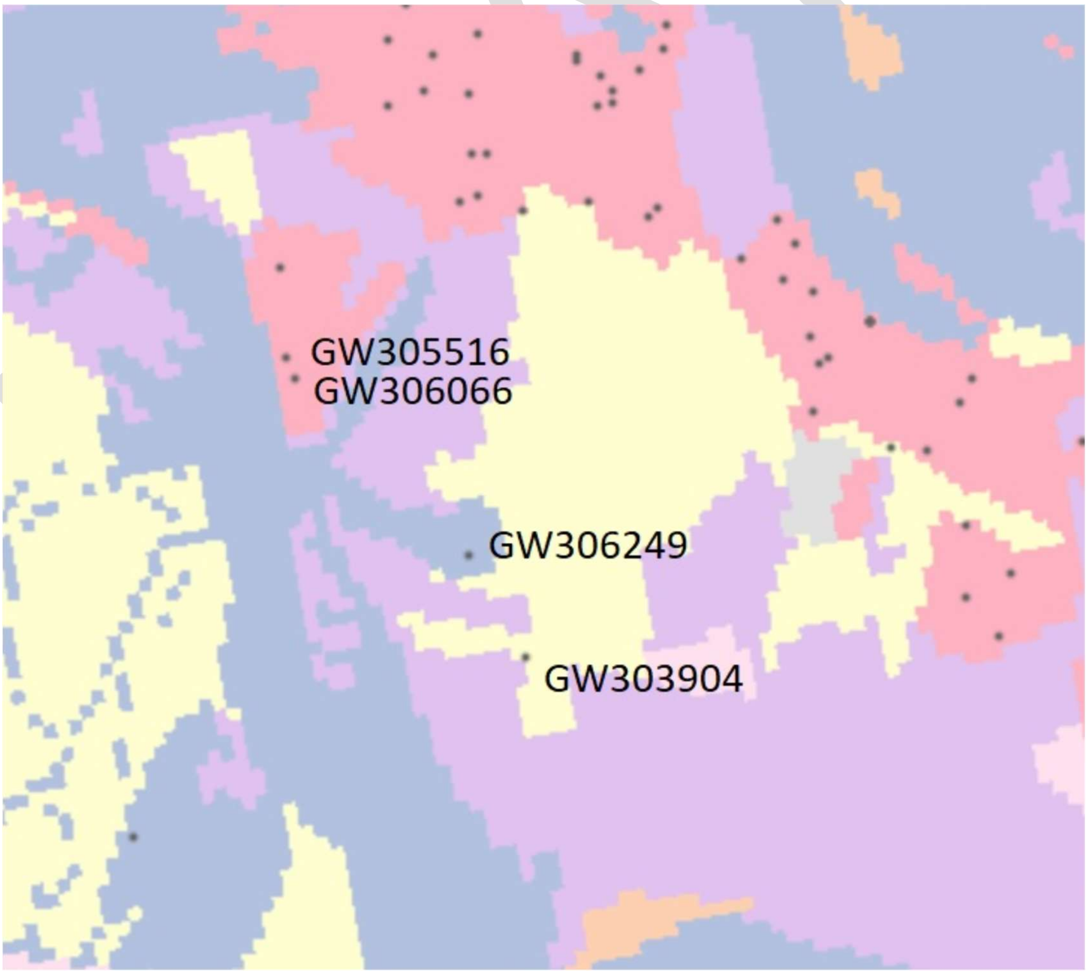


Figure 3.4: Bore hole locations within a 1 km radius of the site

4.0 Site history

The site history information summarised below is based on information obtained from Easterly Point (2021), and the referenced published sources.

4.1 Site history summary

The site appears to have primarily been used for grazing land, with some small areas of intensive agricultural use, e.g. cropping. A number of structures have been constructed on the site, including:

- a residential house built between 1980 and 2004, with a small driveway fronting Carrs Drive;
- a bare-earth shed located near the residential dwelling, denoted 'Shed 1', constructed between 1993 – 2004;
- various structures/sheds/dwellings located in the central portion of the site, denoted 'Sheds 2', constructed between 2004 – 2011; and
- a former dwelling/shed located in the northern portion of the site, constructed pre-1980 which burnt down circa. 2010 - 2015, with only concrete slabs remaining; and
- a small (incomplete) wooden building, constructed in the early 2000's, located in the area of the former residential dwelling/shed in the north.

4.2 Land use information

4.2.1 Council records

A search of council records relating to development applications, was conducted on 7 July 2022. The search identified that there were various DAs for the surrounding land, including a multi-dwelling development, seniors living units and various subdivisions associated with site filling.

The subdivision of Lot 3 DP733507 to create Lot 31 on DP1280863 (104 Carrs Drive) and Lot 32 on DP1280863 (110 Carrs Drive), was approved on 30 October 2020.

4.2.2 Aerial photograph review

Eleven aerial photographs were available from 1942 – 2020, including at least one per decade. The aerial photographs are shown in Appendix A. The following information was determined from interpretation of the aerial photographs:

Table 4.1: Aerial photograph summary review

Photograph	Description
1942 (black and white)	The site was predominantly cleared, with the surface cover comprising of grass. The stream can be seen traversing the eastern portion of the site and running parallel to the southern site boundary before joining Oyster Channel. Some sparse vegetation is visible along the stream-line. The ground covering the north-eastern portion of the site may be indications of cropping, in particular on 110 Carrs Drive. There are no buildings visible onsite. The surrounding land appears similar to that on-site, with primarily cleared land and some areas of intensive agricultural use, e.g. cropping.
1958 (black and white)	The eastern half of the site remains cleared. However, the western portion of the site is moderately vegetated. There are no buildings visible onsite. A few small residential dwellings have been constructed in the areas surrounding the site.

Photograph	Description
1967 (black and white)	Vegetation has increased across the eastern portion of the site, with the western portion now densely vegetated. Trees are visible across what was possible an area of cropping, suggesting this use is no longer occurring. A residential building has been constructed circa 150 m south of the site, with its driveway onto Carrs Drive. The area approximately 250 m north of the site is densely vegetated.
1971 (black and white)	The entire site has been cleared, with some scattered trees remaining across the site and along the banks of the stream. Windrows of what is assumed to be vegetation are visible on the western portion of the site, with some minimal windrows on the eastern portion. A small area of disturbance is visible in the south-eastern corner of the site in a squared-off area. The surrounding area appears largely unchanged from the previous aerial photograph. Areas of cropping are visible on the land to the immediate south and north.
1980 (black and white)	A number of structures are visible in the northern portion of the site. It appears there is one larger structure, and two smaller structures which may be storage sheds. The western portion of the site is moderately vegetated. The surrounding area appears largely unchanged from the previous aerial photograph.
1993 (colour)	The residential dwelling of 120 Carrs Drive has been constructed. There are small structures visible to the north and south of the dwelling, which appear to be storage sheds. The structures in the northern portion of the site are visible. Three small areas of disturbance/fill are visible, two in the cleared area in the eastern portion, and one within the western dense vegetation. It is not clear what these represent. The land to the immediate north (eastern portion) is either used for cropping (larger crops size) or windrows of vegetation. The area immediately to the south of the site has been cleared, with the appearance of a residential dwelling and a small dam beyond. The area beyond Oyster Channel has been developed, with the construction of a road and a water diversion channel, marking the beginning of a large housing development.
2004 (colour)	The eastern portion of the site is primarily cleared while the western portion is made up of dense vegetation. What appears to be a large shed is visible approximately 50 m south-west of the residential dwelling. Another residential dwelling is visible in the northern portion of the site, approximately 50 m to the west of the neighbouring property at 104 Carrs Drive in the area of the previously observed structures. A line of disturbance, possible an access-track is visible in the centre of the eastern portion of the site.

Photograph	Description
	A residential dwelling and large shed were constructed on the neighbouring property located at 104 Carrs Drive. The housing development to the north of Oyster Channel appears completed. Residential properties and the school buildings area visible to the north of the site.
2011 (colour)	The site remains largely unchanged, except for the presence of a small structure/shed in the central portion, and a smaller structure to the immediate south of this 'shed' is visible. Access roads/tracks are visible across the site. The area surrounding the site appears largely unchanged, except for a few additional residential buildings. The land to the immediate south is disturbed with what appears to be an industrial-looking construction.
2012 (colour) SIX maps	The stream can be seen traversing the eastern corner of the site, with vegetation along the banks. The residential dwelling fronting Carrs Drive is clearly visible. The area from the stream to Carrs Drive is primarily cleared and grassed with the exception of vegetation in the southern corner, where a structure can be seen amongst the trees. The residential house in the northern area of the site is visible, including what appears to be the main house, with two smaller structures visible adjoining the house, and a car parked in the driveway. A small structure/disturbed area is visible to the south-west of the house, although features cannot be discerned. The structure in the north-western portion of the site is clearly visible (Shed 2). A fenced area is observed to the north-west of the structure, estimated to be approximately 40 m x 20 m, surrounding a large tree. A small area of disturbed ground is visible within the fenced off area. Disturbance within 110 Carrs Drive is evident along the eastern, southern and western boundaries. The disturbance along the southern boundary appears to be a dirt road, with what may be stockpiles along thew western boundary fenceline.
2015 (colour)	The site remains largely unchanged, except that the residential dwelling in the northern portion of the site is no longer present, with what appears to be only a concrete slab remaining. The small structure in the central portion of the site is visible, and vegetation appears to be growing along/forming fence lines, with vegetation generally increasing across the eastern portion. The shed structure to the south-west of residential dwelling fronting Carrs Drive is no longer visible, although may be hidden by the dense vegetation (trees). The surrounding area appears largely unchanged.
2020 (colour)	All areas of the site are densely vegetated except for the area in proximity to the residential dwelling of 120 Carrs Drive. The existing smaller structures of the site are still visible, although the structure/shed in the central portion is barely visible due to vegetation, and a small structure with a green

Photograph	Description
	appearance is visible to the south-east of the concrete slab in the northern portion. The 110 Carrs Drive area is primarily cleared, with approximately 35 small white structures visible. There appears to be large development work occurring approximately 200 m to the north of the site. There is cropping and agricultural activity visible on the land to the immediate south of the site.

Based on review of the aerial photographs, the western portion of the site was cleared pre-1942, before being progressively covered in vegetation, up until 1971, where the area was completely cleared. There is no evidence from the aerial photographs that the western portion of the site has been used for any intensive agricultural uses.

It appears that the site has primarily been used for rural landuse, some minor intensive agricultural activities undertaken in the north-eastern portion of the site. A residential house was built between 1980 and 1993, with a small driveway fronting Carrs Drive, and a number of sheds/structures/dwellings appear to have been constructed in two separate areas, visible from 1980 onwards.

No evidence of widespread filling was evident for the site history review.

4.3 Activities conducted

Based on information known to date, it appears that the site has primarily been used for rural land use, with some intensive agricultural activities historically undertaken in limited areas of the site. A residential house is present on the site with an associated shed, as well as a number of current and former sheds/structures/dwellings. It is assumed that general household chemicals, including fuels and oils have been used and stored at the site, although specific uses and activities are not known.

4.3.1 Chemical usage and storage

The potential contaminants of concern are outlined in Table 4.1.

Table 4.1: Primary contaminants and origins

Activity or Source	Contaminants
Primary contaminants and origins	
Building products[4] and paints[5]	Lead (Pb) and asbestos.
Herbicides and pesticides usage and storage during historical agricultural activities	Arsenic (As), organochlorine pesticides and organophosphorus pesticides (OCPs/OPPs).
Potential uncontrolled filling/dumping at the site	Metals[1], total relative hydrocarbons (TRHs), benzene, toluene, ethylbenzene, xylene(s) and naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAHs) and OCPs/OPPs and asbestos.
General farming/household chemical use and storage	Metals, TRHs, BTEXN, PAHs, OCPs/OPPs.
Fuels, oils	Pb, TRHs, BTEXN and PAHs

Table notes:
1. Arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury.

In relation the areas of intensive agriculture, i.e. cropping, NSW EPA[6] describes that:

> *small-cropping, local orchards and market gardens are all significant consumers of pesticides and farm chemicals. There are generally fringes of small plantations, orchards and market gardens around all towns and cities. These areas are eventually overtaken by urban growth. Their potential for adverse health and environmental effects should not be ignored*

It is highlighted that a request for a *Site search for Schedule 11 Hazardous Chemicals on Premises* via SafeWork NSW was not completed as part of this investigation. This search relates to the storage of hazardous chemicals, where if you store, handle or process Schedule 11 hazardous chemicals (previously known as dangerous goods) that exceed the quantities specified (manifested quantities) in the *Work Health and Safety Regulation 2017*, then you must notify SafeWork NSW. For example, for Flammable Liquids 3, e.g. petrol, the manifest quantity is 10,000 L. Given the site use, it is unlikely that bulk chemicals were stored at the site above the specific volumes for notification, and/or notification/updates provided to SafeWork.

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[4] Australia phased out the use of asbestos from the 1980s and banned it's use, sale or import in 2003. Before it was banned, asbestos was used in over 3000 products including construction materials and vehicles. Many homes and buildings built or renovated before 1990 still contain asbestos (NSW Government, https://www.asbestos.nsw.gov.au/safety/safety-in-the-home/when-was-asbestos-banned-in-australia#:~:text=Australia%20phased%20out%20the% 20use,before%201990%20still%20contain%20asbestos.

[5] All houses built prior to the mid-1970s contain lead-based paint, and homes built up to the 1940s are especially hazardous because there was so much lead used in paints at that time. Houses built after the mid-1970s can still be a risk if old house paint or industrial or marine paint has been used (SA Health, Lead-based paint Fact Sheet https://www.sahealth.sa.gov.au/wps/wcm/connect/d43c4d8048f12740888aef0e3d7ae4ad/Fact%2BSheet%2B-%2BLead-based%2Bpaint+UPDATED+011021.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-d43c4d8048f12740888aef0e3d7ae4ad-nMWc-OK) .

[6] https://www.epa.nsw.gov.au/licensing-and-regulation/authorised-officers-and-enforcement-officers/resources-and-training/contaminated-agricultural-land

4.3.2 Incidents and spills

No records in regard to incidents or chemical spills were sighted or reported to Easterly Point.

However, observations of spill and leaks were observed by Easterly Point (2021) in and around the residential property and shed on 120 Carrs Drive.

4.3.3 Waste management

Based on the site history review and site inspection conducted by Easterly Point in June 2021, a number of observations were made relating to waste management at the site:

- A stockpile of timber was observed approximately 20 m north of the residential building, and general rubbish surrounded the building, with an old tractor near the front of the house.

- An oil drum was observed to be located on top of a metal structure approximately 50 m north of the residential building. There was visible oil staining across the metal structure, with a strong hydrocarbon odour observed in the immediate vicinity.

- A large open shed (denoted 'Shed 1') was observed to contain various items and rubbish, including batteries, scattered across the area.

- A pile of bricks and a drainpipe which potentially contained ACM, mixed with other debris, was observed in the northern portion of the site, in the area of the former residential dwelling which burnt down.

- Waste was present along the southern border of 110 Carrs Drive, along the boundary fence line. Waste material observed included an old mattress and building material, such as bricks, concrete and metal.

The residential dwelling fronting 120 Carrs Drive is connected to a septic tank. Waste management at the other dwellings is unknown.

4.3.4 Filling

No specific information was identified by Easterly Point during the site history search regarding filling at the site. Based on relatively consistent site levels with the surrounding land, it is assumed that no major filling has occurred, however, minor areas of filling may have occurred across the site, in particular in areas of buildings.

4.4 Services

A services search was conducted through Dial Before You Dig on 6 July 2022, which showed the site is connected to Essential Energy electricity, as well as Telstra networks.

The Essential Energy electricity plan showed there are 'underground earth or wires' along Carrs Drive, but no underground cables or critical assets were located on or adjacent to the site. There were also power poles along Carrs Drive and along the northern boundary of the site.

Telstra lines and pits are present along Carrs Drive, entering the site at the residential property at 120 Carrs Drive, and at the northern boundary of 104 Carrs Drive.

Dial Before You Dig plans are provided in Appendix B.

4.5 Licences, permits and notices

Table 4.3 outlines a list of online data bases pertaining to licences, permits and notices for the site, reviewed in July 2022.

Table 4.3: Database searches for contaminated land

Data base	Use of data base	Result
NSW EPA Contaminated Land Record	The register lists sites that present a significant risk of harm to human health and/or the environment under the CLM Act 1997. The register shows all current and former remediation orders issued on sites in NSW.	The site, nor any sites in Yamba, are listed on the contaminated land register.
NSW EPA List of Contaminated Sites	The register lists contaminated sites in NSW that have been notified to the EPA under the duty to report obligations under the CLM Act. Sites appearing on this list indicate the contamination may or may not be significant enough to warrant further investigation, remediation or regulatory intervention by EPA.	The site was not listed on the register. It is noted that the EPA was notified about a former service station located approximately 2 km to north of the site, however, EPA decided that regulation under the CLM Act is not required.
Licensed Activities under the POEO Act	Current and former licensed activities under the POEO Act.	There are no current licences that exist for the site under the POEO Act.
EPA and Defence PFAS Investigation Programs	Sites that are part of the EPA PFAS investigation program and sites that are being investigated by the Department of Defence for PFAS.	There are no records for the site and surrounding area within 500 m.
NSW Heritage Database	The State Heritage Register is a list of places and objects of particular importance to the people of NSW. To be listed, an item must be significant for the whole of NSW.	The site is not listed on the NSW Heritage Database.
NSW Department of Primary Industries register for cattle dip sites.	The register lists the known cattle dip sites in the Northern Rivers Region that the NSW Government was involved with.	The site was not identified on the register. Approximately 350 m north of the site, a dip site, known as Yamba, was recorded to be in use from 1939. The dip is recorded as being decommissioned and capped.

4.6 Previous investigations

The following report was available for review:

- Easterly Point Environmental (14 July 2021) *Due diligence environmental site assessment 120 Carrs Drive, Yamba NSW*, (Ref. 21029L01-080721).

4.6.1 Easterly Point 2021

The objectives of this due diligence investigation were to:

- assess whether contamination had the potential to exist onsite and whether further investigation was needed; and
- to collect sufficient information to provide the client with an appreciation of the contamination status of the site prior to purchasing the land.

The following scope of work was undertaken:

- limited site history review;
- development of investigation design documents, including a preliminary CSM, DQOs and SAQP;
- completion of a site inspection and limited intrusive soil investigation within targeted areas; and
- analysis of 10 samples at the laboratory for potential contaminants of concern (PCoCs).

The site history review and site inspection identified the site has primarily been used for rural residential landuse, with a number of structures identified across the site. It is highlighted that a large portion of the site was inaccessible due to access restrains associated with overgrown vegetation, and the soil investigation was limited to three areas of the site in the areas of current and/or former buildings.

All PCoCs were either non detect or below the adopted criteria, with the exception of two locations where elevated hydrocarbons were detected. Based on the results of the investigation, the following recommendations were made:

- further investigation of Shed 1 based on the observed material stored within the shed, the bare earth floor and the elevated concentrations of total recoverable hydrocarbons (TRHs) detected in the area;
- further investigation into the source, nature and extent of the elevated TRHs detected near Shed 2; and
- investigation into potential impacts in the area of the former dwelling in the north of the site, in particular for asbestos, given the age of the building and extensive fire that resulted in the building being burnt down.

4.7 Anecdotal information

The following information was obtained during the site inspection conducted by Easterly Point, as reported in Easterly Point (2021), and is based on anecdotal information provided by the owner of the neighbouring property located at 104 Carrs Drive:

- a residential dwelling was previously located on the northern portion of the Lot, on the two concrete slabs that still remain;
- the dwelling burnt down approximately 5 – 10 years ago. The rubble and associated waste was disposed offsite;
- the eastern portion of the site had been used for livestock grazing; and
- a stockpile was present on the site before the residential dwelling on the northern block was erected. The stockpile was reported as containing building materials such as corrugated iron sheets and timber. It is unknown whether asbestos containing material (ACM) was present.

No further anecdotal information has been sourced.

5.0 Site features and condition

The site condition described below is based on inspections conducted as part of the diligence investigation in June 2021, as reported in Easterly Point 2021. It is highlighted that the site inspection did not constitute an environmental site audit or hazardous materials survey.

5.1 Site features and conditions

Site features and conditions are described in Table 5.1. The information is primarily based on that described in Section 4.

Table 5.1: Site features and conditions

Feature	Location	Description
Creek	Eastern portion of 110 Carrs Drive.	Second order stream running through the site, to be retained.
Residential house	Fronting Carrs Drive, located at 120 Carrs Drive.	Residential dwelling built between 1980 and 2004, constructed of brick and timber, with no visible sign of ACMs. The area surrounding the residential dwelling largely comprised of grass, except for a concrete slab directly adjoining the house to the north. A stockpile of timber was located approximately 20 m north of the building and general rubbish surrounded the building. An old tractor was also located adjacent to the house along Carrs Drive.
Shed 1	Near residential dwelling fronting Carrs Drive	Large open shed structure surrounded by overgrown vegetation. The shed is constructed of timber and corrugated iron sheeting, with no visible signs of ACM, with the floor bare earth. Various items and rubbish, including batteries, scattered across the area. Constructed between 1993 – 2004, based on aerial photographs.
Metal structure and oil drum	Approximately 50 m north of the residential dwelling, near Shed 1.	TRHs >C16-C34 detected above management limits at a concentration of 5,300 mg/kg, in area of an oil drum, located on top of a metal structure There was visible oil staining across the metal structure, with a strong hydrocarbon odour observed in the immediate vicinity (Easterly Point 2021).
Shed 2	Located in the north-west of the property.	A metal demountable structure with wooden foundations. It appeared that the structure was possibly used as a small dwelling/granny flat. Constructed between 2004 – 2011 based on aerial photographs. Elevated TRHs detected near Shed 2 (Easterly Point 2021).
Fenced off area	North-west of the property, to the north-west of Shed 2.	As observed on the 2012 aerial photograph, a fence can be seen, approximately 40 m by 20 m,

Feature	Location	Description
		around a large tree. A disturbed patch of ground is visible within the fenced off area.
Former residential dwelling	Located in the northern portion of the site	Former dwelling/shed, constructed between 1971 and pre-1980. Anecdotal information suggests that the concrete slabs observed were the foundation of a former residential dwelling which burnt down circa. 2010 - 2015. It is understood that most of the building debris were removed shortly after the event. Some debris was observed (Easterly Point 2021), including a pile of bricks and a drainpipe which potentially contained ACM. A small (incomplete) wooden building, estimated to be constructed in the early 2000's, is located in the area of the former residential dwelling.
Rubbish/waste stockpiles along driveway	Along the access road of 110 Carrs Drive, along the southern boundary fence line.	Rubbish/waste was observed to be stockpiled along the driveway, including bricks, concrete and metal.

5.2 Integrity assessment

Based on the historical information available for review, there is generally good agreement between the various sources of information in regard to site history and usage. The site history information documented in Section 4, including anecdotal information, is generally consistent with the physical findings of the site, as discussed above.

6.0 Investigation design

The NEPM (2013, B2) describes that the design components of investigations are:
- establishing the objectives of the site assessment;
- desktop study (and/or review of existing information) and detailed site inspection, and compiling a site history (and/or data compilation report) from relevant site-related information;
- development of a conceptual site model (CSM) and identification of data gaps;
- development of data quality objectives (DQOs); and
- design of a sampling, analysis and quality plan (SAQP).

6.1 Conceptual site model

A preliminary conceptual site model (CSM) has been developed for the site based on the currently known information obtained from the site history review and previous investigation undertaken by Easterly Point in June 2021.

A CSM is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors, with each source-pathway-receptor having to form a complete pathway for there to be a potential risk of harm. An overview of the potential contaminant sources, pathways and receptors at the site is summarised below and shown in Figure 6.1.

The site is located in a predominantly rural area, with the western boundary of the site fronting Oyster Channel, with a small stream entering the site from Oyster Channel and running parallel to the southern site boundary before traversing the eastern portion of the site. It does not appear that the stream has been historically re-aligned based on review of historical aerial photographs.

The western portion of the site has been covered in dense vegetation since 1958, before which the whole site was cleared land. There is no evidence from the aerial photographs that the western portion of the site has been developed, including any buildings/structures, intensive agricultural activities, etc.. It is understood that the site is located in a flood-prone area with sandy soils, with shallow groundwater expected to be encountered from approximately 0.5 m depth.

The site has primarily been used for rural residential land use, with intensive agricultural activities historically undertaken in limited areas of the site.

A number of structures have been constructed on the site, including:
- a residential house built between 1980 and 2004, with a small driveway fronting Carrs Drive;
- a bare-earth shed located near the residential dwelling, denoted ‘Shed 1’, constructed between 1993 – 2004;
- various structures/sheds/dwellings located in the central portion of the site, denoted ‘Sheds 2’, constructed between 2004 – 2011; and
- a former dwelling/shed located in the northern portion of the site, constructed pre-1980 which burnt down circa. 2010 - 2015, with only concrete slabs remaining; and
- a small (incomplete) wooden building, constructed in the early 2000’s, located in the area of the former residential dwelling/shed in the north.

The structures/dwellings may have been constructed of hazardous building materials, i.e. ACM, in particular the residential dwelling in the north being constructed pre-1980.

No evidence of widespread filling is evident. However, filling may have occurred beneath the structures. Waste, as stockpiles, was evident along the southern boundary of the Lot 110 Carrs drive site.

The western portion of the site is not proposed to be disturbed during development, with the eastern portion subject to filling.

Based on the above, the source-pathway-receptor summary includes:

Sources:
- potentially impacted fill underlying the buildings/sheds and paved surfaces, including heavy metals, organics (TRHs, BTEXN, PAHs and OCPs/OPPs), and asbestos fibres/fragments;
- OCPs/OPPs from herbicides and pesticides used and stored during historical agricultural activities;
- petroleum hydrocarbon contaminants related to potential use and storage of oils and fuels in the sheds;
- dumping of waste associated with agricultural farm and residential use; and
- ACMs from structures located at the site.

Exposure pathways:
- dermal contact, inhalation of dust/fibres and ingestion of soil by current tenants and during development;
- inhalation of vapours in enclosed spaces by current residents/visitors and residents/visitors post-development; and
- dermal contact or ingestion of contaminated groundwater, primarily used for irrigation.

Extensive filling with waste, i.e. a potential source of hazardous ground gas, has not been identified on the site at this stage, and therefore vapour intrusion from hazardous ground gas has not been considered as a viable pathway.

Receptors:

The site is currently understood to be vacant and unused. The future receptors are considered to include;
- future site construction/development workers;
- future residents, considered to be residential receptors with minimal opportunities for soil access (HIL-B) in accordance with the NEPM (2013, B1);
- future site visitors or site workers or maintenance staff;
- on-site plants and animals; and
- on-site and off-site ecological receptors, such as the onsite steam and Oyster Channel.

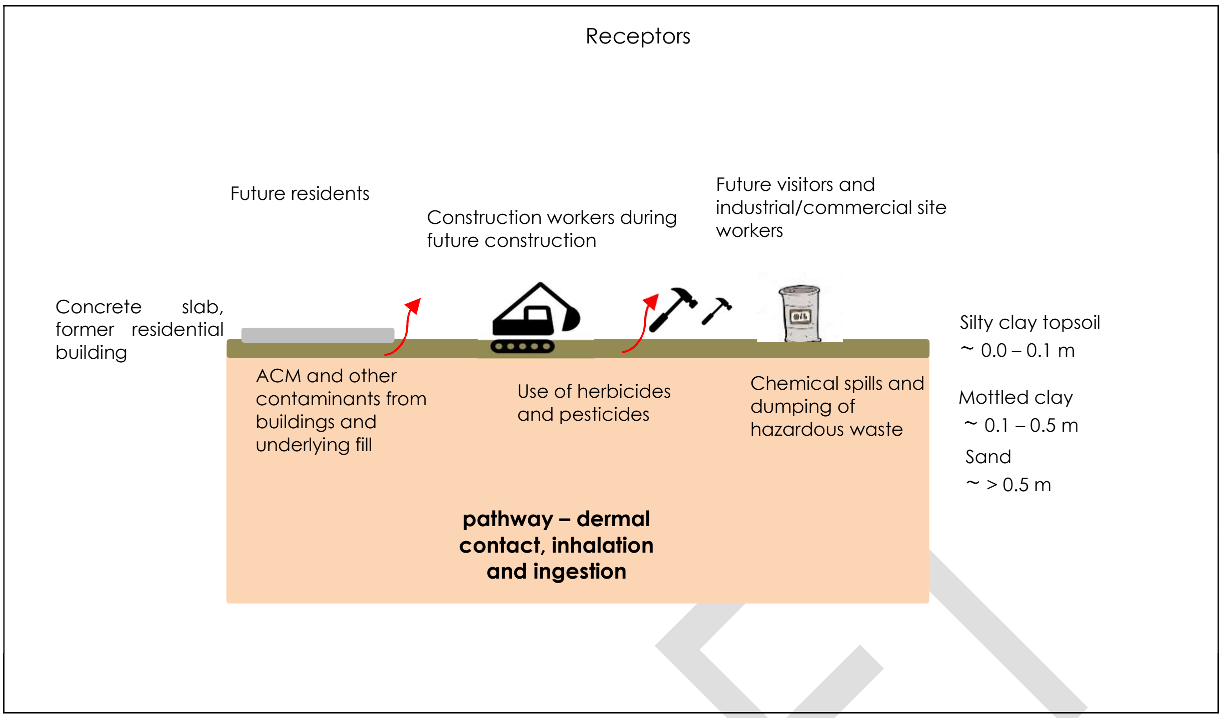


Figure 3.1: Conceptual site model
All materials, features and depths are approximate.

6.2 Data quality objectives

The NEPM (2013, B2) describes that the DQO process is a seven-step iterative planning approach, that is used to define the type, quantity and quality of data needed to inform decisions relating to the environmental condition of sites. It notes that:

> *The DQO process should commence before any investigative work starts, with the timing for various stages of the project being clearly understood by all parties. It is useful to apply the process initially at a project level to determine the overall project requirements and then modified as required for specific investigation activities.*

The DQOs summary has been developed primarily using USEPA (2006), although some information has been included from US EPA (2000) to clarify the requirements. The Australian Standard AS 4482.1-2005 also provides useful information. Although described in some detail in EPA (2017) and the ASC NEPM (2013), the use of these references is not recommended as standalone documents for conducting a DQOs process. Rather USEPA (2006) should be referred to for statistical details and examples of use, as any attempt to conduct a DQOs planning process without use of the primary references, particularly USEPA (2006), will result in an incomplete planning process.

The DQOs process is summarised in Table 6.1.

Table 6.1: Summary of DQOs process[1]

Step	Description of actions
Step 1	State the problem – summarising the contamination problem that will require new environmental data and identifying the resources available to resolve the problem. A preliminary CSM is developed as part of this step.
Step 2	Identify the decision/gaol of the study – identifying the decisions that need to be made about the contamination problem and the new environmental data required to make them.

Step	Description of actions
Step 3	Identify the information inputs – identifying the information needed to support any decision and whether new environmental data will be needed. Decisions made during this step are of a draft or preliminary nature, and are reviewed in Step 7 to develop the SAQP.
Step 4	Define the boundaries of the study – specifying the spatial and temporal aspects of the environmental media that the data must represent to support decision(s).
Step 5	Develop the analytic approach – defining the (statistical) parameters[2] of interest, specifying the action level, and integrating information from Steps 1 – 4 into a single statement that gives a logical basis for choosing between alternative actions.
Step 6	Specify performance or acceptance criteria – specifying the decision-maker's acceptable limits on decision errors (e.g. alpha and beta for statistical analysis), which are used to establish performance goals for limiting uncertainties in the data.
Step 7	Develop the plan for obtaining data – identifying the most resource-effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

Table notes:
1. From ASC NEPM (2013, B1); and
2. The NEPM describes this as the "analytical approach"; reference to USEPA (2006) shows this as the "analytic approach", described as the "appropriate population parameters for making decisions or estimates", with examples of "the true mean, median, or percentile".

As part of the SAQP, DQOs have been developed, with the DQOs summary output provided in Appendix C. This has informed the design of the field program, as outlined in Section 4.

7.0 Sampling strategy and methodology

Sections 4 and 5 form the SAQP, which detail the proposed sampling and analysis based on the attached DQOs.

7.1 Soil sampling strategy

Justification for the proposed judgemental sampling design is provided below.

NSW (1995)[7] describes for sites over 5 ha, the minimum number of sample locations recommended is 11 points per ha[8]. Given this would equate to over 100 sample locations for the developable area, and based on the site history findings and activities conducted, a targeted sampling strategy is considered suitable for this site.

As such, the following sampling strategy is proposed:

– the site will be stratified based on the proposed developable area, with physical sub-surface investigations limited to area of development in the eastern portion of the site;
– broad site coverage to investigate areas of agricultural use, noting that a limited sampling plan in judgemental locations is proposed; and
– targeted to areas of potential concern, e.g. the current and former infrastructure.

A targeted sampling plan is considered to be sufficient for the purposes of this PSI, where NSW EPA (1995) describes that a judgemental sampling can be used where there is sufficient information regarding probable locations of contamination, and that:

- A grid-based sampling pattern that meets the sampling density described in NSW EPA 1995 is not considered to be warranted or a viable sampling pattern for this site based on the historic landuse, i.e. no significant industrial or intensive agricultural usage.

- A grid-based sampling density, as per NSW EPA (1995), would be based on detecting a circular hot-spot with a diameter of 35.6 m with 95% confidence. As the land use is relatively uniform and well understood, a grid of this size is unlikely to uncover areas of contamination that are not already being targeted in the judgemental sampling plan; and

- A grid-based sampling pattern is unlikely to be achievable based on the dense vegetation.

Notwithstanding the above, based on access constraints, sample locations will be placed in areas across the site to capture non-point source, broad-site coverage.

A summary of prosed sample locations is provided in Table 7.1.

---

[7] NSW EPA (1995) *Sampling design guidelines*.

[8] Based on detecting circular hotspots by using a systematic sampling pattern.

Table 7.1: Site features and conditions

Feature	No. sample locations	No. samples for laboratory analysis	Justification
Creek	3	3	To understand current condition, and inform baseline assessment and any potential management/ remedial requirements.
Shed 1	2	6	Investigation required based on observed storage within the shed and bare earth floor.
Elevated hydrocarbons in area of an oil drum, located on top of a metal structure	4	8	Delineation of impact, both vertically and horizontally.
Shed 2	4	6	Investigation of the source, nature and extent of the elevated TRHs detected in Easterly Point 2021, as well as additional coverage of the area.
Concrete slabs/former residential dwelling in northern portion of the site	4	6	Further investigation into potential impacts in the area of the former dwelling, in particular for asbestos, given the age of the building and extensive fire, as well as additional coverage of the area.
110 Carrs Drive	4	6	Targeted to potentially contaminating features/areas of concern identified during the site inspection, including those identified during due diligence investigation, including dumping of waste along the southern border of 110 Carrs Drive, along the fence line. Waste material previously observed included an old mattress and building material, such as brick, concrete and metal.
Whole of site	4	-	No sample locations pending access and physical findings. Samples will only be collected for analysis where physical findings indicate potentially contaminating activity/feature.
Totals	*25*	*35*	-

Table notes:
1. Total samples is for primary samples only. Does not include duplicates/inter-laboratory duplicates required to be collected at a rate >5%.

In summary, the adopted sampling strategy for the site is considered to be an effective data collection process which meets the project objectives. It also provides a strategy:

- that provides baseline data for the site, which may be used in future investigations;
- Is targeted to most likely contaminating areas based on site history review; and
- that is specific and justifiable.

It is highlighted that the above sampling plan is based on a site history review and that site conditions encountered may differ from those expected.

7.2 Sampling methodology

The investigation will be undertaken in accordance with Easterly Point's standard operating procedures, which are consistent with EPA made and approved guidelines and industry standards, and include:

- EPFW-PR01, Soil sampling – general;
- EP SHE-PR02, Personal protective equipment;
- EP SHE-PR04, Decontamination of personnel; and
- EP SHE-PR06, Decontamination of sampling equipment.

The above procedures are included in Appendix D. A general overview of the sampling methodology for soils is provided below.

7.2.1 Soils

Soil bores will be either advanced using a track-mounted drill rig, under the supervision of the drilling contractor, or via hand tools (auger or shovel).

Samples collected directly from the auger/hand tool with a gloved hand. To avoid cross contamination, care will be taken to ensure samples are not collected directly from material attached to the auger. A new pair of disposable gloves will be used to collect each sample.

All soil samples will be immediately collected into laboratory supplied glass jars and filled to the top to minimise headspace. Samples will then be placed directly into chilled eskies for transportation to the laboratory under chain-of-custody (COC) documentation. The primary laboratory is Eurofins Sydney. The secondary laboratory will be ALS, Sydney. Both Eurofins and ALS are NATA accredited for the tests performed.

A PID will be used to screen for volatile organic compounds (VOCs) where suspected VOC impacts are identified, which may aid in the selection process for samples to be analysed.

8.0 Contaminants, media and assessment criteria

This section discussed the potential contaminants of concern, (PCoCs), environmental media of interest and adopted assessment criteria.

8.1 Potential contaminants of concern

As described in Section 4.3.1, PCoCs will include TRHs, BTEX, PAHs, heavy metals, asbestos, OCPs and OPPs.

A review of Appendix B of the PFAS NEMP[9] was undertaken to determine if activities including PFAS are relevant to the site. Based on the information known to date, and the preliminary stage of the investigation, analysis for PFAS is not considered to be required at this stage. However, if new information comes to light, this understanding may change.

Laboratory analysis

Standard laboratory analysis will include PCoCs as identified above. It is highlighted that these are a broad suite analysis aimed at identifying a range of contamination from various activities, including the storage of fuel, and potentially certain pesticides and herbicides on the site.

Quality control samples will be collected at a rate of 10%, as required by NEPM.

8.2 Media

The environmental media of interest is primarily soils, including both fill and natural soils, where encountered. Sediment samples will also be collected.

8.3 Criteria

The below soil assessment criteria will be used to evaluate the soil analytical results.

8.3.1 Human health criteria

A Tier 1 assessment was conducted as part of this preliminary investigation, as per Schedule B(1) of the ASC NEPM (2013). A Tier 1 assessment provides an initial screening of the data to determine whether further assessment is required. A range of health investigation levels (HILs) are available and re referenced in this assessment, however, based on the site's location and proposed land use, a combination of HIL-A and HIL-B will be adopted:

- HIL A, Standard residential with garden/accessible soil (home grown produce e 10% fruit and vegetable intake, (no poultry), includes children's day care centres, preschools and primary schools.

- HIL B, Residential with minimal opportunities for soil access, includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.

- HIL C, Includes developed open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. Does not include undeveloped public open space which should be subject to a site-specific assessment where appropriate.

---

[8] Heads of EPA (January 2018) *PFAS National Environmental Management Plan*, HEPA.

- HIL D, Commercial/industrial includes premises such as shops, offices, factories and industrial sites.

For PAHs, the benzo(a)pyrene (B(a)P) TEQ criteria provided in the NEPM is derived for the carcinogenic PAHs, with a toxicity equivalence factor (TEF) calculated for each carcinogenic PAH, based on its toxicity relative to B(a)P. The NEPM describes the following:

> *The TEF approach assumes that the risk posed by individual carcinogenic PAHs is additive and proportional to the potency of each compound in the mixture. The potency of individual carcinogenic PAHs is expressed relative to B(a)P.*

PAHs results will be assessed using the BaP TEQ approach.

Further to the above, the results for TRHs and BTEXN will be assessed against the health screening levels (HSLs) to determine and risks associated with vapour intrusion.

6.3.2 Ecological criteria

Schedule B(1) of NEPM (2013) provides a range of investigation levels for the protection of ecosystems, referred to as ecologically-based investigation levels (EILs) and ecological screening levels (ESLs), which are applicable for assessment of risk to terrestrial ecosystems.

Based on the sites location and proposed land use, the EILs for urban residential and public open space (80% species protection level) will be referred to. It is noted that Schedule B1 of the ASC NEPM (2013, B1) describes that the EILs principally apply to the top 2 m of soil which corresponds to the root zone and habitat zone of many species.

EILs are generally derived based on summing the ambient background concentration (ABC) (measured at an appropriate reference site) with the added contaminant limit (ACL), calculated based on site-specific soil characteristic properties. Based on the preliminary nature of this investigation, background samples and site-specific soil characteristics are not proposed to be investigated, and as such, generic ACLs will be referred to, where available for aged contaminants.

6.3.3 Petroleum management Limits

Following appropriate consideration of the HSLs and ESLs, the purpose of the Management Limits is to "avoid or minimise" potential effects of petroleum hydrocarbons. ASC NEPM (2013, B1) provides these as an interim Tier 1 guidance to manage effects of:

- formation of observable LNAPL;
- fire and explosive hazards; and
- effects on buried infrastructure.

Management limits for residential, parkland and open space will be adopted as conservative criteria.

6.3.4 Aesthetic criteria

There are no specific numeric aesthetic criteria, however site assessments require balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity. For example, higher expectations for soil quality would apply to residential properties with gardens compared with industrial settings (ASC NEPM 2013, B1). Issues to be addressed include odours, staining, monolithic deposits, and potentially dangerous material such as rubble with steel, sharps and the like.

6.3.5 Application of criteria

The ASC NEPM (2013, B1) describes that:

> *The selection of the most appropriate investigation levels for use in a range of environmental settings and land use scenarios should consider factors including the protection of human health, ecosystems, groundwater resources and aesthetics.*

And that "A balance between the use of generic soil, soil vapour and groundwater criteria and site-specific considerations is essential practice in site assessment". Noting that the ASC NEPM (2013), describes that "Human health should be a primary concern when assessing land use and exposure

9.0 Data usability

Quality assurance (QA) involves all of the planned and systematic actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples collected for analysis, and accuracy and reliability of the analytical results (NEPM 2013). Quality control (QC) is the component of QA which monitors and measures the effectiveness of other procedures by the comparison of these measures to previously decided objectives.

There are various components of QA/QC which address the operation of the laboratories and the routine procedures conducted to achieve a minimum level of quality. Examples of QA components include sample control, data transfer, instrument calibration, staff training, etc. Examples of QC components include the measurement of samples to access the quality of reagents and standards, cleanliness of apparatus, accuracy and precision of methods and instruments, etc. Generally, the management of laboratory QA issues is addressed through accreditation by the National Association of Testing Authorities (NATA), or similar, and monitoring of these issues is not addressed on a project by project basis.

Project specific field QA and field and laboratory QC is conducted to ensure the quality of data can be assessed. Field QA includes formalised procedures, log sheets and field notes, the documentation of the use and calibration of field equipment, and the collection of QC samples.

Based on EPA made or approved guidelines, the following QC samples are required for all contaminated site investigations, unless otherwise specified as part of the data quality objectives (DQOs) process review. All data to be used for assessments should conform as a minimum to the requirements specified, regardless of minimum sample size. Based on the constraints of analysis for Agvet chemicals, limited QC samples will be analysed.

Quality control sample	Frequency	Results [1]
Precision		
Field duplicates	≥ 5%	≤ 30 - 50% [2]
Inter-laboratory duplicates	≥ 5%	≤ 30 - 50% [2]
Laboratory duplicates	≥ 10%	Lab specified [3]
Accuracy		
Surrogate spikes.	Organics by GC	70 – 130% [4]
Matrix spikes (MSs)	≥ 1/media type	70 - 130% [5]
Laboratory control samples (LCSs)	≥ 1/lab batch	70 - 130% [6]
Certified reference material (CRM)	LCS for metals	Lab specified [7]
Representativeness		
Rinsate samples (reusable equipment)	≥ 1/field batch	< LOR
Trip blanks	≥ 1/field batch (volatiles)	< LOR
Trip spikes	≥ 1/field batch (volatiles)	70 - 130%, ≤ 30 - 50% [8]
Laboratory blanks	≥ 1/lab batch	< LOR
Field blanks	≥ 1/field batch[9]	< LOR

Notes:

1. Where results are laboratory specified, the laboratory analytical reports should be consulted for specific information.
2. Relative percentage differences (RPDs) for field duplicates from AS 4482.1 (1997).

3. RPDs for laboratory duplicates specified by the laboratory. Based on the magnitude of the results compared to the level of reporting (LOR), e.g. ALS: result < 10 x LOR = no limit, 10 – 20 x LOR = 0-50%, > 20 x LOR = 0-20%. LabMark: < 5 x LOR = 0-100%, 5 – 10 x LOR = 0-75%, > 10 x LOR = 0-50% or 0-30% for metals.
4. Surrogate recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
5. MS recoveries specified by laboratory based on global acceptance criteria.
6. LCS recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
7. CRM recoveries specified by laboratory based on global acceptance criteria.
8. Trip spike results are specified as either recoveries or RPDs.

10.0 Glossary and references

10.1 Glossary

BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
COC	Chain of custody
EIL	Environmental Investigation Level
ENM	Excavated natural material
HSL	Health based screening level
LOR	Laboratory of Reporting
NATA	National Association of Testing Authorities
NEPM/C	National Environmental Protection Measure/Council
PFAS	Per and poly-fluoralkyl substances
QA/QC	Quality assurance/quality control
RPD	Relative percentage difference
SAQP	Sampling, analysis and quality plan
WHS	Work health and safety

10.2 References

Australian and New Zealand Governments (ANZG) (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

Department of Environment and Conservation (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*. DEC, Sydney.

EPA (1995) *Contaminated Sites: Sampling Design Guidelines*, (Ref. 95/59), NSW EPA, Sydney.

EPA (2005) *Guidelines for assessing former orchids and market gardens*.

EPA (2017) *Contaminated Land Management - Guidelines for the NSW Site Auditor Scheme* (3rd edition), NSW EPA, Sydney.

EPA (2020) *Consultants reporting on contaminated land: contaminated land guidelines.*

Heads of EPA (January 2018) *PFAS National Environmental Management Plan*, HEPA.

National Environment Protection Council (NEPC) (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Schedule A and Schedules B(1) – B(9)*, National Environment Protection Council, Canberra.

National Uniform Drillers Licensing Committee (2011) *Minimum Construction Requirements for Water Bores in Australia*.

Standards Australia (1997 *Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds (AS 4482.1-1997)*.

Standards Australia (1999) *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances (AS 4482.2-1999)*.

USEPA (2006, G-4) *Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4*, (Ref. EPA/240/B-06/001).

USEPA (2006, G-9R) *Data Quality Assessment: A Reviewer's Guide, EPA QA/G-9R*, (Ref. EPA/240/B-06/002).

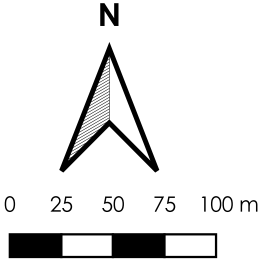
USEPA (2006, G-9S) *Data Quality Assessment: Statistical Methods for Practitioners, EPA QA/G-9S*, (Ref. EPA/240/B-06/003).

Figures

Figure 1: Site features

Lot 2 in DP733507
Project number: 21029
Date of fieldwork: 23/06/21
Client :Manage-Design-Engineer
Pty Ltd

Drafted by: JW
Data source: SIXMaps, Google



Easterly Point

Figure 2: Soil sample locations

Lot 2 in DP733507
Project number: 21029
Date: 23/06/21
Client :Manage-Design-Engineer
Pty Ltd

Legend
● Sample locations

N
0 25 50 75 100 m

Easterly Point

Drafted by: JW
Data source: SIXMaps, Google

Appendix A

Aerial Photographs

Aerial Imagery 2020

120 Carrs Drive, Yamba, NSW 2464

Legend

- Site Boundary
- Buffer 150m

Scale:

Data Sources: Aerial Imagery:
© Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 22 June 2021

Aerial Imagery 2015

120 Carrs Drive, Yamba, NSW 2464

Legend

- 🟪 Site Boundary
- ⬛ Buffer150m

Scale: 0 80 160 240 320 Meters	Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 21 June 2021

Aerial Imagery 2011

120 Carrs Drive, Yamba, NSW 2464

Legend

🟪 Site Boundary

⬛ Buffer150m

Scale:

Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 21 June 2021

Aerial Imagery 2004

120 Carrs Drive, Yamba, NSW 2464

Legend

🟪 Site Boundary
⬛ Buffer150m

Scale: 0 80 160 240 320 Meters	Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 21 June 2021

Aerial Imagery 1993

120 Carrs Drive, Yamba, NSW 2464

Scale: 0 80 160 240 320 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 02 July 2021

Aerial Imagery 1980

120 Carrs Drive, Yamba, NSW 2464

Legend

🟪 Site Boundary

⬛ Buffer 150m

Scale:

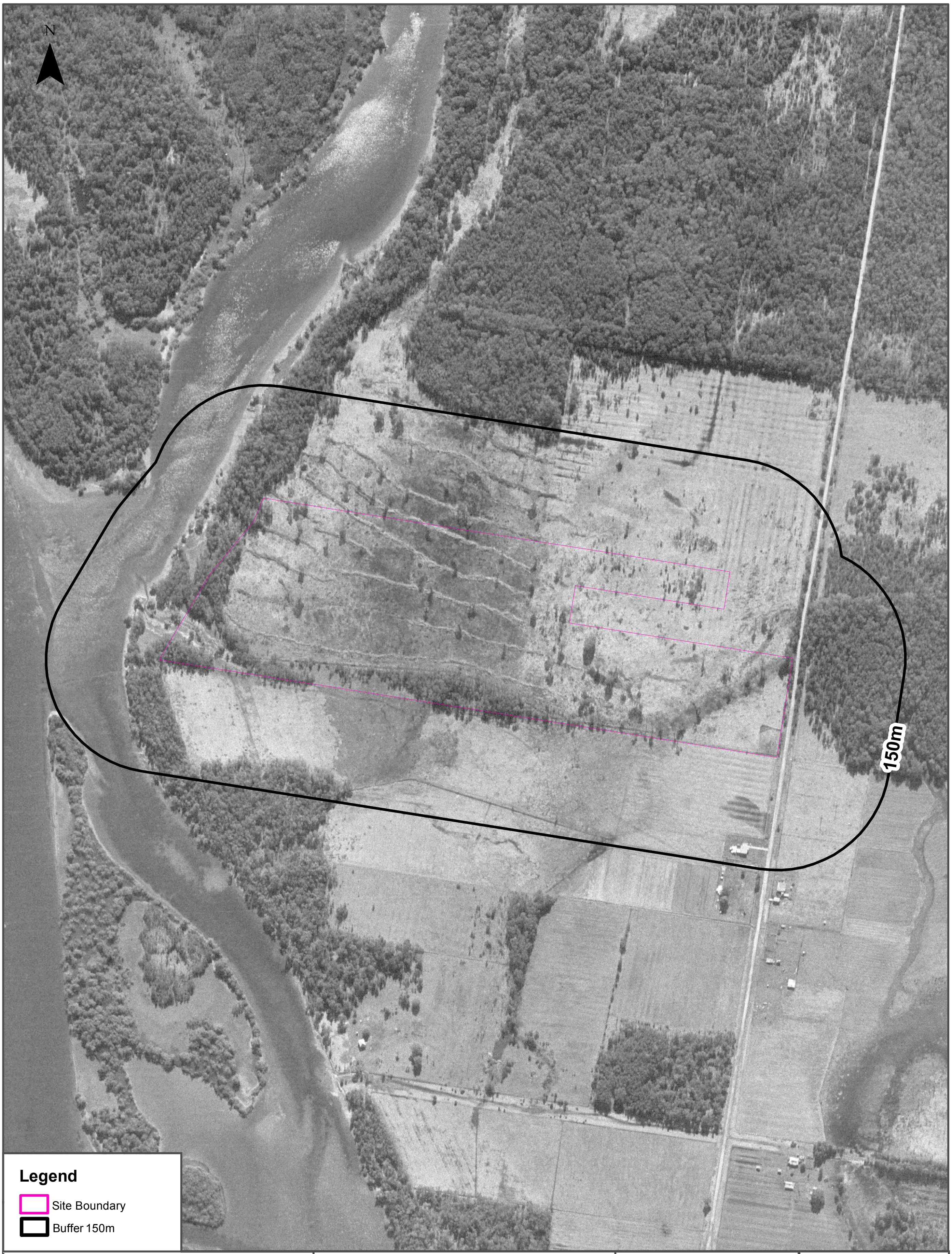
Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 21 June 2021

Aerial Imagery 1971

120 Carrs Drive, Yamba, NSW 2464



Scale:

0 80 160 240 320
Meters

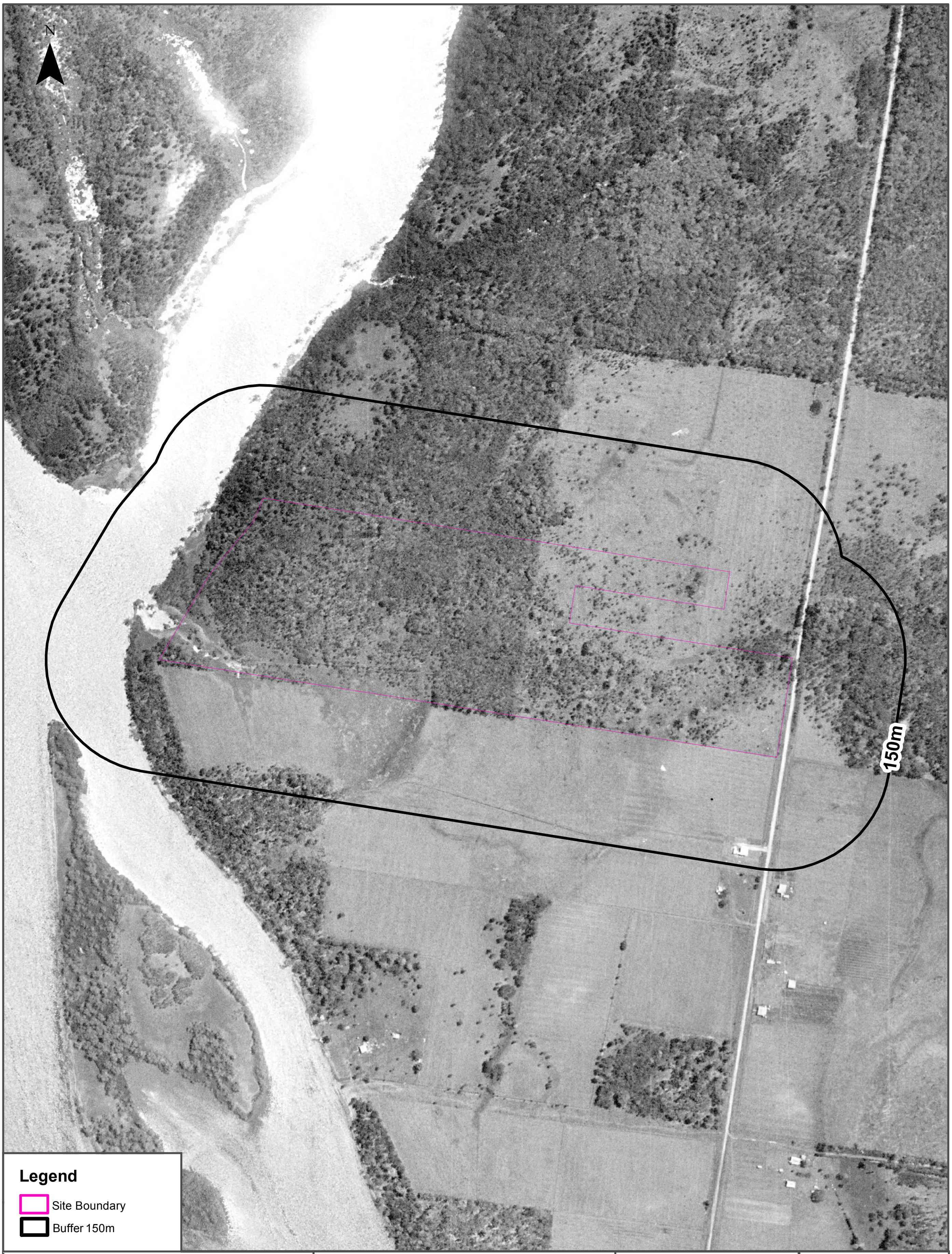
Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 21 June 2021

Aerial Imagery 1967

120 Carrs Drive, Yamba, NSW 2464



Legend

- 🟪 Site Boundary
- ⬛ Buffer 150m

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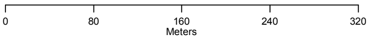


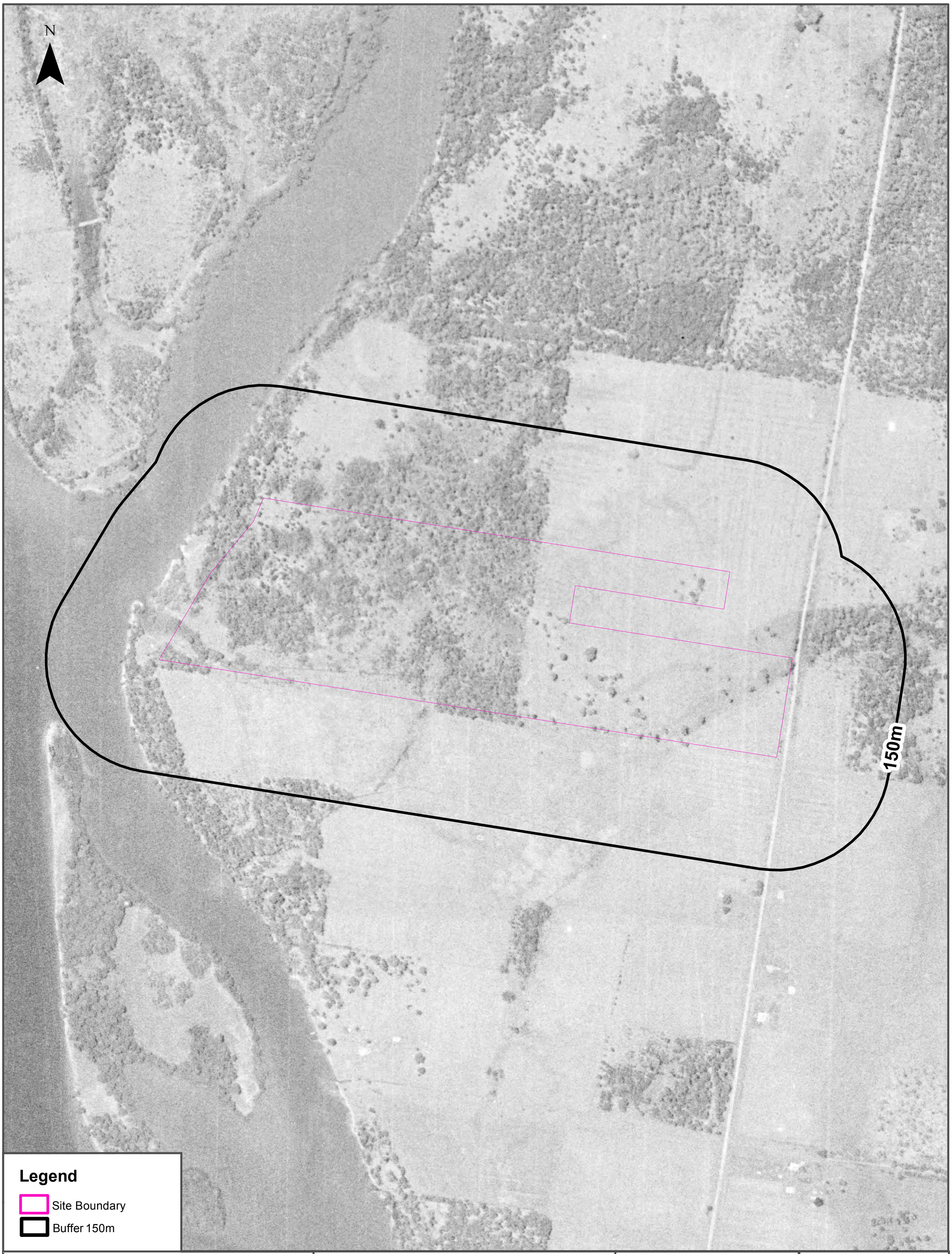
Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 21 June 2021

Aerial Imagery 1958

120 Carrs Drive, Yamba, NSW 2464



Legend

▭ Site Boundary

▭ Buffer 150m

Scale:
0 80 160 240 320
Meters

Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 21 June 2021

Aerial Imagery 1942

120 Carrs Drive, Yamba, NSW 2464

Legend

🟪 Site Boundary

⬛ Buffer 150m

Scale: 0 80 160 240 320 Meters	Data Source Aerial Imagery: ©2021 Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 56	Date: 21 June 2021

Appendix B

Dial Before You Dig Plans

Job No 32281141

Phone: 1100
www.1100.com.au

Caller Details

Contact: hailey murphy
Company: Easterly Point Environmental
Address: Unit 1 64 Kingsley Street
Byron Bay NSW 2481

Caller Id: 3252243
Phone: (02) 6685 6681
Email: hailey@easterlypoint.com

Dig Site and Enquiry Details

WARNING: The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

User Reference: 21029
Working on Behalf of: Private

Enquiry Date:	**Start Date:**	**End Date:**
06/07/2022	12/07/2022	13/07/2022

Address:
120a Carrs Drive
Yamba NSW 2464

Job Purpose:	**Onsite Activities:**
Excavation	Mechanical Excavation, Vertical Boring
Location of Workplace:	**Location in Road:**
Both	Road, Nature Strip, Footpath

- Check that the location of the dig site is correct. If not you must submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

Notes/Description of Works:
Not supplied

Your Responsibilities and Duty of Care

- The lodgement of an enquiry does not authorise the project to commence. You must obtain all necessary information from any and all likely impacted asset owners prior to excavation.
- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using this service, you agree to Privacy Policy and the terms and disclaimers set out at **www.1100.com.au**
- **For more information on safe excavation practices, visit www.1100.com.au**

Asset Owner Details

The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days.
Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the Before You Dig service, so it is **your responsibility** to identify and contact any asset owners not listed here directly.
** Asset owners highlighted by asterisks ** require that you visit their offices to collect plans.
\# Asset owners highlighted with a hash # require that you call them to discuss your enquiry or to obtain plans.

Seq. No.	Authority Name	Phone	Status
213355572	Essential Energy	13 23 91	NOTIFIED
213355571	Telstra NSW North	1800 653 935	NOTIFIED

END OF UTILITIES LIST

CABLE/PIPE LOCATION

Assets were found in the search area

COMPANY NAME:	Easterly Point Environmental
ATTENTION:	hailey murphy
SEARCH LOCATION:	120a Carrs Drive Yamba NSW 2464
SEQUENCE NO:	213355572
DATE:	Wednesday, 6 July 2022

Provision of Plans:
Please find enclosed plans depicting approximate locations of **Essential Energy** assets in the search location***.*** ***The excavator must not assume that there may not be assets owned by other network operators in the search location.***

Underground assets searched for	**Underground assets found**
Essential Energy Electrical	☑
Essential Energy Water & Sewerage	☐

Plans are updated from time to time to record changes to underground assets and may be updated by Essential Energy without notice. In the event that excavation does not commence within 28 days of receipt of a plan, a new plan should be obtained.

The excavator must retain the plans on site for the duration of the works.

The excavator shall report all damage made to Essential Energy assets immediately. Note that damage includes gouges, dents, holes and gas escapes.

IN CASE OF EMERGENCY OR TO REPORT DAMAGE:
PHONE 13 20 80

DISCLAIMER

Please be aware that plans may **not** reflect alterations to surface levels or the position of roads, buildings, fences etc. **Cable and pipe locations are approximate** and the plans are **not** suitable for scaling purposes. *Essential Energy does not retain plans for privately-owned underground electrical or water & sewerage assets located on private property.* ***Privately-owned underground electrical assets located on private property are the responsibility of the owner.***

The plans have been prepared for Essential Energy's sole use and benefit. **Essential Energy cannot and does not warrant the accuracy or completeness of the plans**. Essential Energy supplies them at no cost with the object of reducing the serious risk of unintentional damage being caused to its cables and pipes. **Essential Energy does not accept any responsibility for any omissions, inaccuracies or errors in the plans, or any reliance place on the material. Any reliance placed on any plan provided in response to your request is at your own risk.**

Essential Energy retains all intellectual and industrial property rights which exists or may exist in or with respect to the plan(s). The material provided is not to be copies or distributed beyond you.

You release Essential Energy from and against all claims, demands, actions and proceedings arising out of or in any way related to the use of the provided material.

Location of Assets on Site:

The plans indicate only that cables and pipes may exist in the general vicinity – they do not pinpoint the exact location of the cables and pipes.

If it is found that the location of cables or pipes on the plans can be improved, please notify Essential Energy on 13 23 91 (or fax 1800 354 636).

All individuals have a duty of care they must observe when working in the vicinity of underground cables and pipes. It is the **excavator's responsibility to visually expose the underground cables and pipes manually**, **ie. by using hand-held tools and non-destructive pot-holing techniques prior to any mechanical excavation.** The excavator will be held responsible for all damage caused to the Essential Energy network or cables and pipes, and for the costs associated with the repair of any such damage. The excavator will also be held responsible for all damage caused to any persons.

When digging in the vicinity of underground assets, persons should observe the requirements of the applicable Codes of Practice published by the NSW Work Cover Authority or Safe Work Australia, and any amendments from time to time by the Authorities, including although not limited to:

- Excavation Work
- Managing Electrical Risks in the workplace
- How to manage and control asbestos in the workplace

(Please refer to https://www.workcover.nsw.gov.au/law-and-policy/legislation-and-codes/codes-of-practice).

When digging in the vicinity of **electrical assets** persons should observe the requirements of the **Electricity Supply Act 1995.**

Persons excavating near live underground electrical reticulation and/or earthing cables **must exercise extreme caution at all times and adhere to the requirements of Essential Energy's Electrical Safety Rules.** (These are available on our website: http://www.essentialenergy.com.au/content/safety-community and include

- **Work near Essential Energy's Underground Assets:**
  http://www.essentialenergy.com.au/asset/cms/pdf/contestableWorks/CEOP8041.pdf , and
- **Asbestos Fact Sheet**:
  http://www.essentialenergy.com.au/asset/cms/pdf/safety/AsbestosFactSheet.pdf

In some situations these procedures call for work to be performed by authorised staff.

Should there be any doubt as to the exact location of any underground electrical assets, and the potential for conflict with live underground cables caused by excavation at your work site, you should contact **13 23 91** to arrange for an on-site visit by an Essential Energy representative**.** No construction or mechanical excavation work is to commence prior to this on-site visit and approval being obtained.

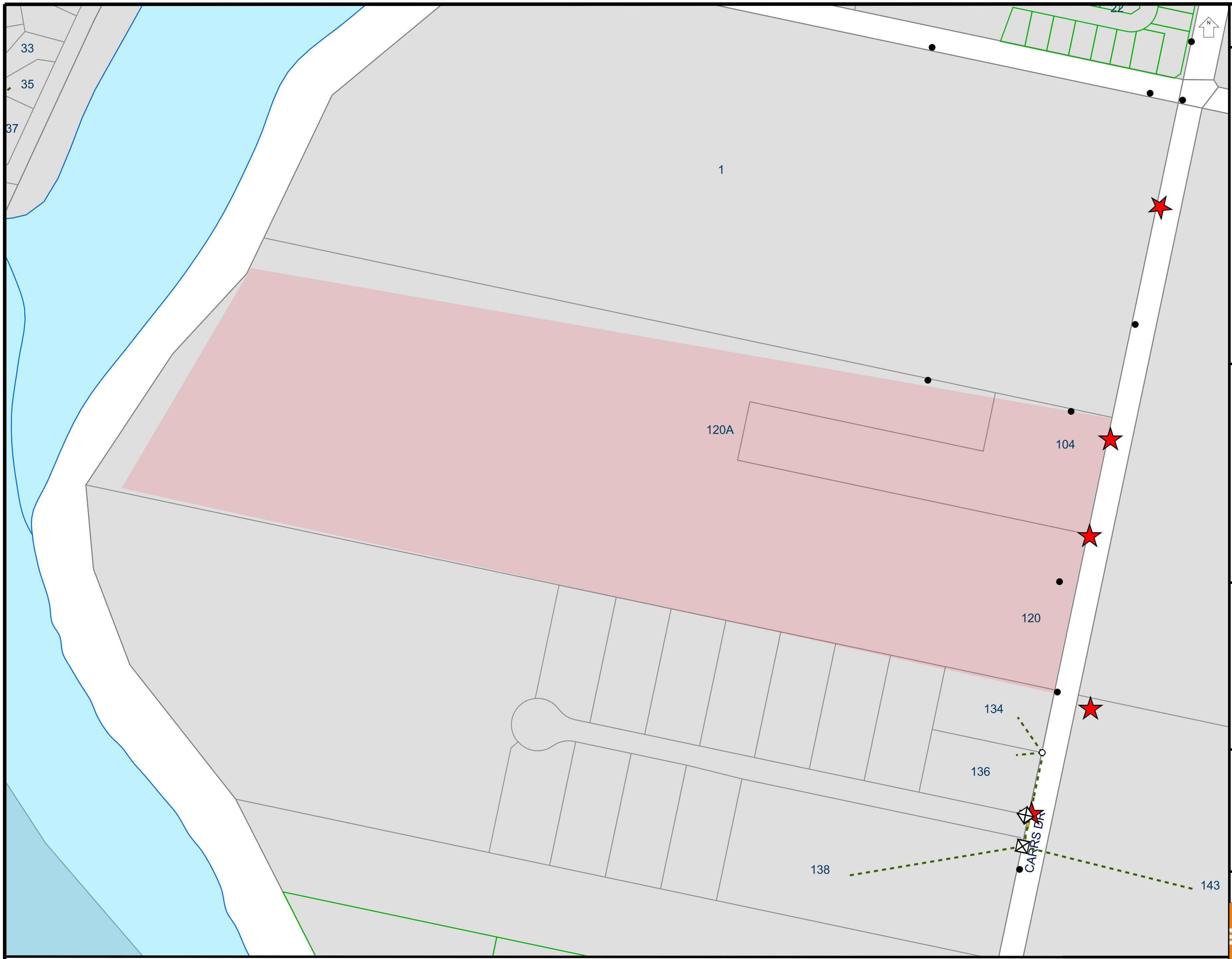
When digging in the vicinity of **water or sewer assets** persons should observe the requirements of the **Water Management Act 2000.**

Should there be any doubt as to the exact location of any underground water and sewer assets, and the potential for conflict with underground water and sewer pipes caused by excavation at your work site, you should contact **13 23 91** to arrange for an on-site visit**.** No construction or excavation work is to commence prior to this on-site visit and approval being obtained.

Prior Notification:

Please note that for excavation depths greater than 250mm near power poles and stays you should allow for **advance notice** in your construction program to permit Essential Energy time to allocate the necessary field resources to carry out the inspection at the site a **minimum of fourteen (14) working days prior to work commencing**. This service may incur a fee and this can be negotiated with the local Area Coordinator at the time of making the appointment. Failure to give reasonable notice to the local Area Coordinator may result in disruption to Essential Energy's planned works program in the district and could incur an extra charge over and above the normal rate for this service.

For further information please call 13 23 91.



Overhead wires not shown
LOOK UP & LIVE!

LEGEND

- ┅ LV Underground Cable
- ┅ HV Underground Cable
- ┅ Underground Pipe
- ★ Underground Earth or Wires
- ▲ Ground Substation
- ● Pole
- ☒ Cubicle
- ○ Pit
- 🟥 Area of Interest

Critical Assets

Contact Essential Energy on 13 23 91

- ▨ Zone Substation
- ┅ Underground Cable
- ┅ Underground Fibre

Proposed Works

- ▨ Area of proposed works

Proposed assets are shown as orange symbols

THE INFORMATION ON THIS MAP MAY NOT BE ACCURATE.
If details are incorrect, please notify
Essential Energy on
13 23 91
(or fax 1800 354 636)

ISSUE DATE: 06/07/2022

You must resubmit your request if you have not started work within 4 weeks of the 'Issue Date' above

A4 SCALE: 1:4231

essential energy

Job Number: 32281141 Sequence number: 213355572 Job location: 120a Carrs Drive, Yamba Map Centre: 153° 19' 39.3", -29° 26' 27.6" essential energy

ELECTRICITY SAFETY WHILE EXCAVATING

When working near underground electrical infrastructure

NSW legislation requires people who are planning to do excavation work to obtain copies of underground electricity cable plans through Dial Before you Dig (Phone 1100) and to make sure that the plans are no more than 30 days old when excavation commences.

The aim of the legislation is to ensure that when workers dig or drive items near underground electricity cables, ducting, and pipes, they will establish the exact location of the cables and thus avoid coming into contact with them or damaging them. These items carry vital services such as electricity, water, gas and communications, and establishing their location before digging will help ensure worker safety and prevent damage to the network which may cause disruption of essential services to local communities.

Excavate safely and protect underground assets

Dial Before You Dig (DBYD) is the first step to excavating safely. You should use DBYD when you will be undertaking (but not restricted to) the following:

> Any excavation using machinery digging deeper than 150mm. This includes but is not restricted to back hoes, excavators, borers & kanger hammers (ploughing or ripping activities)

> Any excavation using hand tools deeper than 300mm which includes shovels, spades and crow bars

> Any vertical or horizontal boring.

Note: The above examples are general and may not cover all situations in the regulations where a DBYD would be required e.g. driving metal posts in the ground.

Regardless of the size of your project you should lodge an enquiry with DBYD before commencing work. This applies to small tasks like backyard landscaping, driving items into the ground as well as heavy work such as directional boring or directional drilling. DBYD strive to respond to enquiries within two business days.

Dial Before You Dig

> Phone 1100
> Web www.1100.com.au
> Download the DBYD iPhone app

DIAL BEFORE YOU DIG®
www.1100.com.au
The Essential First Step

When a DBYD has been obtained, contact Essential Energy on **13 23 91** to identify any underground pipes and/or cables in the vicinity of excavation works to be carried out. Allow at least **two weeks or 10 working days advance notice** in your construction program to permit Essential Energy time to allocate the necessary field resources to carry out an onsite inspection if required. This service may incur a fee & should be stated at the time of making the appointment.

In the event the excavation does not commence within 28 days of receipt of a plan, a new plan should be obtained. The excavator **must** retain the plans on site for the duration of the excavation works.

Your responsibility

All individuals have a duty of care they must observe when working in the vicinity of underground cables, ducts and pipes. Be aware of the requirement set out in the latest WorkCover Codes of Practice 'Work near Underground Assets Guideline' and 'Work near Overhead Powerlines' which can be viewed at **www.workcover.nsw.gov.au** or you can purchase a copy of the Code of Practice by contacting WorkCover on 1300 799 003.

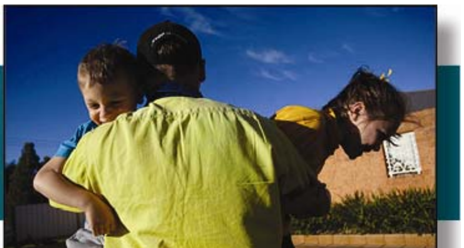
You should also be familiar with Essential Energy's operational procedures 'Work near Essential Energy's underground assets' CEOP8041 and 'Construction work near electricity network' CEOP1116, which can be found at essentialenergy.com.au/construction

> **Employers:** If you're an employer or employing someone to excavate, complete construction or drive items into the ground even at home you have a legal obligation to ensure their safety

> **Excavators:** It is the excavator's responsibility to visually expose the underground pipes and cables manually before any construction begins.

Note – when excavating involving high pressure water or compressed air to break up the ground, which is then removed by a powerful vacuum unit to expose critical utilities after they have been electronically located to confirm identity, size, number of services and depth, checks should be carried out to ensure the pressure is acceptable for all cables and other assets which may be found prior to commencing pot holing by this method. Warning: CONSAC cables shouldn't be potholed by this method and must be de-energised before any work carried out near them. It's recommended to only use air/vacuum equipment to pot hole that operates at or less than 13,790Kpa (2000psi).

Be safe, because they need you



No Go Zone for powered excavation

Extract from WorkCover "**Work near Underground Assets**"

TABLE 1: Types of assets and limits of underground approach

Assets	Clearances	No Go Zone for Powered Excavation	Controls	Typical Depths
Low voltage electricity cables – voltages less than or equal to 1000V (1kV)	Close proximity with the use of hand tools	300 mm	Must contact asset owner for specific conditions	450 – 750 mm
Electricity conductors from 11,000V (11kV) up to 33,000V (33 kV)	Close proximity with the use of hand tools	600 mm	Must contact asset owner for specific conditions	900 mm
Underground sub-transmission cables 33,000V up to 132,000V (132 kV)	Must contact asset owner	Must contact asset owner	Must be carried out under the supervision of the asset owner	900 mm
High Voltage Electricity cables – voltages from 1000V (1kV) up to (33 kV)	Close proximity with the use of hand tools	Must contact asset owner	Must contact asset owner for specific conditions	600 – 1000 mm
Extra High Voltage Electricity Transmission cables – voltages above (132 kV) and 330,000V (330 kV)	Must contact asset owner	Must contact asset owner	Work must be carried out under the supervision of the asset owner	800 – 1200 mm

How to expose cables or pipes

Location plans provide an indication of the presence of underground assets only; they do not pinpoint the exact location. This is why manual exposure is required, which can be done by potholing. Underground assets must first be exposed by pot-holing with non-conductive tools to identify their location. Excavation with hand tools shall be carried out carefully up to, but not closer than, the minimum distances specified in Table 1. Several potholes may need to be dug manually to determine and satisfy yourself of the exact locations of cables or pipes to avoid any mishaps. Manual pot-holing needs to be undertaken with extreme care, common sense and while employing techniques least likely to damage cables. For example, orientate shovel blades and trowels parallel to the cable rather than digging across the cable. Look out for sand, plastic strips or specially marked bricks when excavating, which signal the presence of underground cables.

Only once all underground assets have been located, marked and protected against damage can the excavation proceed with caution.

No Go Zone for powered excavation

Directional boring is powered excavation and contact with the asset owner must be made before excavation takes place. For directional boring across the line of an asset a minimum clearance of **300 mm** from the asset shall be maintained. When boring across the line of an underground asset, the location of the asset/s shall be positively proven by hand digging (pot-holing) or by another approved method and a safety observer appointed.

Note: Where the risk assessment identifies a potential risk of making contact with either underground assets, safety observer/s would be required. The safety observer's responsibility is to ensure that approach distances from underground and overhead assets are maintained.

For boring under electricity cables, the only true way of knowing where the directional drill is, is to "see" it. It is necessary to excavate a slit trench at right angles to the approaching drill and 500mm deeper than the asset being protected and beside the cables to confirm the depth of the cables and ensure the drill is not within the minimum approach distance of the cable (specified in Table 1).

For directional boring parallel to the asset and at the level of the asset, a clearance of **500 mm** shall be maintained from the edge of the nearest asset and pot holed at 10m intervals to ensure clearances are maintained with a safety observer appointed.

The four Ps of safe excavation

1. **Plan** – Plan your job. Use the Dial Before You Dig service before your job is due to begin to help keep your project safe. Contact Essential Energy on 13 23 91 to identify any underground pipes and/or cables in the vicinity
2. **Pothole** – Potholing (digging by hand) is a method to assist in establishing the exact location of all underground infrastructure. Only use air/vacuum equipment to pot hole that operates at or less than 13,790Kpa (2000psi)
3. **Protect** - Protecting and supporting exposed infrastructure is the excavator's responsibility. Always erect safety barriers in areas at risk to protect underground networks
4. **Proceed** – But ONLY when you have planned, potholed and put the protective measures in place.

Be safe, because they need you

Digging safely

You cannot be too careful when it comes to safe excavation. Avoiding underground ducting pipe and cable damage is as simple as having the right tools, the right skills and the right information.

- Study the plans you receive from asset owners thoroughly
- Check to see if they relate to the area you requested and make sure you understand them. If you are unclear about what the symbols mean or how to proceed, contact the relevant network owner
- Check the work area for other forms of electrical equipment, including street lights, ground substations, phone boxes or traffic lights – all good indicators that underground cables will be present
- Remember underground cables can also be present even if overhead powerlines have been identified
- Never assume the depth or alignment of pipes and cables. Installed networks assets may not have been installed in a straight line
- Always observe any instructions stated on the plans provided by the asset owner
- Remember, plans and maps identifying the location of underground cables and depths can alter after road upgrades or developments and underground assets may be as little as a few millimetres below the surface
- Other service lines (for example gas mains (pipes) and communication cables) can also be present. Shared trenches are frequently used on underground runs to premises
- New electrical cables are sometimes laid using existing old conduits
- Various methods of protecting underground cables may be utilised (for example electrical bricks, conduits, concrete or flat PVC barriers) or may be direct buried or installed by under-boring methods which may have no visual disturbance of the ground
- Ensure overhead & electrical structures aren't undermined during excavation.

Earth cables

Earth cables are an important part of all electrical installations and have two main purposes:

- To safeguard against the possibility of danger to life
- To maintain the good working order of the electrical network.

They can have potentially dangerous electrical current flowing through them. Usually they have a green and yellow covering but could be a bare cable buried directly in the ground.

Even if the map provided does not show underground cables, earth cables may be present. These earth cables are usually associated with electrical equipment located on the pole such as transformers, switching equipment, permanent earthing points or Padmount / kiosk subs.

It's recommended that if any excavation is to take place within 10m of a power pole with a cable running down it into the ground, contact is made with Essential Energy on 13 23 91 to have the earthing system located. While an effort is made to install the earthing under the powerline and guy if installed, sometimes circumstances may require a variation to this, so done assume where they are installed. The distance and configuration that the earthing cable is installed varies due to the soil conditions and system type (e.g. Single wire earth return (SWER)).

Additional earthing electrodes stakes may be installed to ensure the required earthing reading is obtained.

WARNING:SWER installations

- Contacting SWER earthing can be deadly
- Voltage is present on SWER transformer earthing systems either at 12.7 kV or 19.1kV
- NO excavation is allowed within 10 metres of a SWER transformer pole.

Excavating around electrical poles

Anyone intending to excavate around any electrical item risks serious injury or death as a result of contact with underground cables or the earthing system.

Assets around poles

For excavation depths greater than 250mm near power poles and stays you must arrange for an Essential Energy representative to attend the worksite 2 weeks prior to work commencing. Call Essential Energy on 13 23 91. More information is available in Essential Energy's operational procedure, 'Work near Essential Energy's underground assets: CEOP8041' which can be found at essentialenergy.com.au/construction

Unless otherwise agreed, underground assets and other obstructions around poles are to be kept a minimum distance of 300mm from the periphery of the pole, to allow inspections by the asset owner employees.

No excavation within 10 metres of a SWER transformer pole is to occur without the approval of the local electricity asset owner. It should be noted that the NSW Service and Installation Rules require a sketch of the underground service/consumers mains to be marked inside the switchboard.

The risks are higher for those earthing systems of the SWER constructions as the earthing is utilised as the return path.

Typically any electrical item installed on a pole will have an earth wire running down the pole into the ground, which includes:

- Transformers in urban and rural situations
- Isolation, protection and regulation items.

Transformers located on the ground (padmount and kiosk), besides having underground electrical cables, will have an earthing system installed around them.

Damaged earthing

If an earth cable has been damaged, maintain a clearance of eight (8) meters and contact Essential Energy on 13 23 91. **DONT ATTEMPT** to re-join the cable - this will place you at serious risk.

Operating near underground cables and earths

- Underground cables should never be moved or relocated unless under the express authority of the organisation or person responsible for the powerlines
- The excavator shall report all damage made to Essential Energy assets immediately. Damage includes: gouges, dents, holes and gas escapes
- Never undermine poles, cables, earthing cable, pad-mount and kiosk substations.

Above: Poles with become unstable if undermined

Make sure it can't go wrong

You should ensure that people at work, their equipment (tools and plant) or materials do not come within close proximity to underground powerlines unless:

- A written risk assessment has been completed and a safe system of work implemented
- The relevant safety precautions and worker training requirements, including WorkCover Codes of Practice and Essential Energy's requirements, have been implemented and complied with.

If working in close proximity to underground cables is unavoidable and the risk assessment has been completed, the following should be considered to control the risks and ensure work safety:

- Have the power switched off by Essential Energy
- Consider all conductors as live unless it is positively known they have been de-energised
- Where appropriate, provide ground markings to identify location and warn workers of the presence of underground power and other assets.

Emergency situations

In the event that contact with an underground powerline occurs or cables are exposed or damaged, remembering the following points could help save a life:

- If the situation is at all life threatening, immediately contact the Emergency Services on 000 (triple zero)
- Call Essential Energy's 24-hour supply interruptions line – **13 20 80** to switch off the power if required or report damage or exposure cables / conduits

- If any other underground assets are damaged you should contact the affected asset owners immediately
- Treat underground cables as alive, even if they appear to be dead
- Keep everyone at least eight metres away from the incident site, the person or any machinery making contact with underground cable

- Don't panic or touch the person receiving the electric shock – this could place you at risk
- Untrained, unequipped persons should not attempt to rescue a person receiving an electric shock. All too often secondary deaths occur when others go to the aid of earlier victims
- Remain on/inside the machinery until the supply is disconnected
- If possible, break contact between the machinery and underground cable.

For more information

Essential Energy's Public Safety team is available to facilitate Electrical Awareness sessions and discuss any questions relating to electrical safety. For more information on electrical safety please call

Essential Energy General Enquiries	13 23 91
Essential Energy Supply Interruptions	13 20 80
WorkCover NSW	13 10 50
Dial Before You Dig www.1100.com.au	1100

- Follow us
- or visit essentialenergy.com.au/safety

Safety first: Before you dig or drive items into the ground

1. Contact DBYD
2. DO NOT attempt to excavate with in 10m of any power pole or electrical item
3. Contact Essential Energy on 13 23 91 for assistance to locate cables and earthing
4. Locate asset: Pot-hole
5. Proceed only if you have satisfied yourself it is safe.

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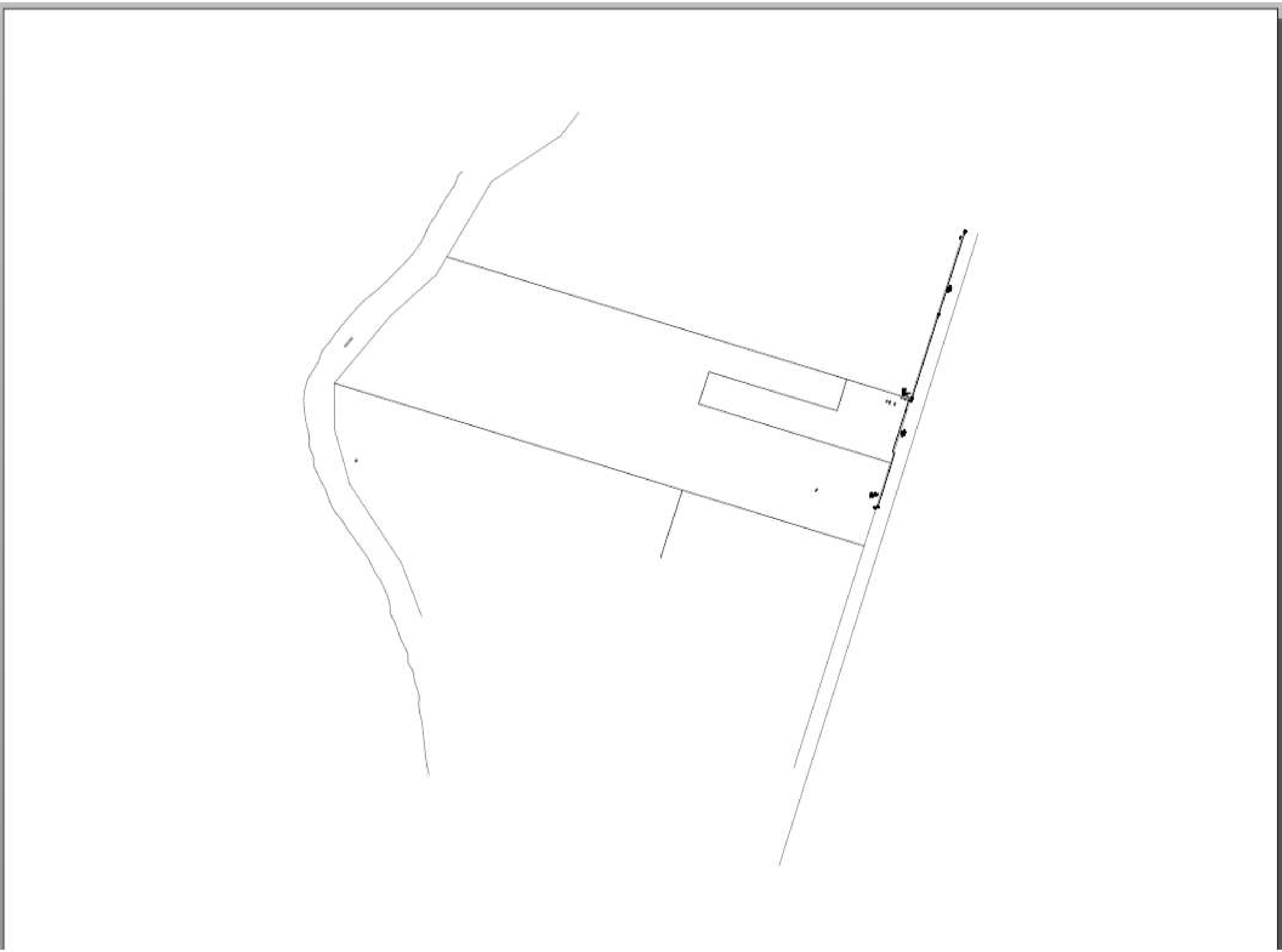
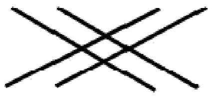
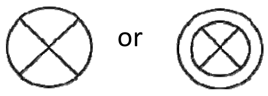
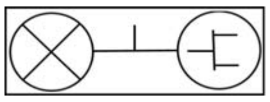
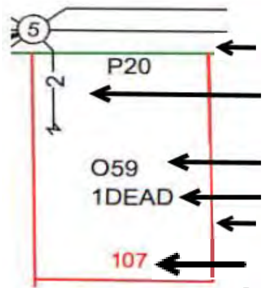
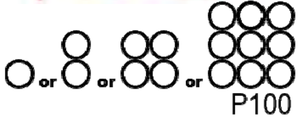
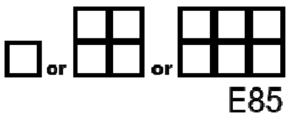
213355571.dwf

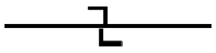
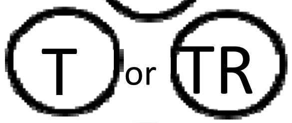


LEGEND

IT'S HOW
WE CONNECT

For more info contact a Certified Locating Organisation or Telstra Plan Services 1800 653 935

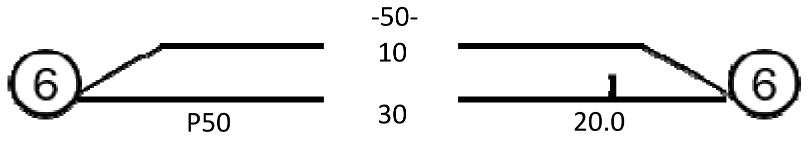
	Exchange (Major Cable Present)
	Footway Access Chamber (can vary from 1-lid to 12-lid)
	Pillar / Cabinet (above ground / free standing)
	Above ground complex equipment housing (eg RIM) Please Note: This equipment is powered by 240V Electricity
OC	Other Carrier Telecommunications Cable/Asset
Dist	Distribution cables in Main Cable ducts
MC	Main Cable ducts on a Distribution plan
▲	Blocked or damaged duct.
	Roadside / Front Boundary 2 pair lead-in to property from pit in street 1 pair working (pair ID 059) 1 pair dead (i.e. spare, not connected) Side / Rear Property Boundary Property Number
	Single to multiple round conduit Configurations 1,2,4,9 respectively (attached text denotes conduit type and size)
	Multiple square conduit Configurations 2, 4, 6 respectively (attached text denotes conduit type and size)

	Cable Jointing Pit (number indicating Pit Type)
	Elevated Joint (above ground joint on buried cable)
	Telstra Plant in shared Utility trench
	Aerial Cable
	Aerial Cable (attached to joint Use Pole eg. Power)
	Direct Buried Cable
	Marker Post Installed
	Buried Transponder
	Marker Post, Transponder
	Optical Fibre cable direct buried

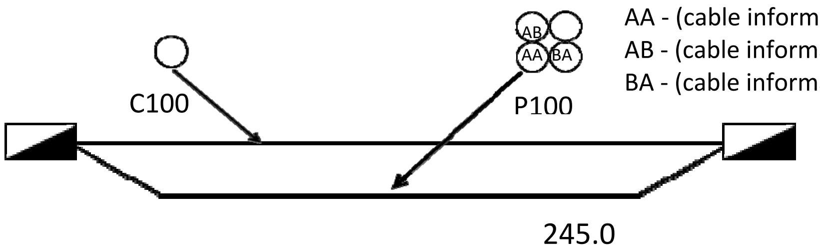
Some examples of conduit type and size:

A - Asbestos cement, P - PVC / Plastic, C - Concrete,
GI - Galanised iron, E - Earthenware
Conduit sizes *nominally* range from 20mm to 100mm
P50 50mm PVC conduit
P100 100mm PVC conduit
A100 100mm asbestos cement conduit

Some Examples of how to read Telstra Plans



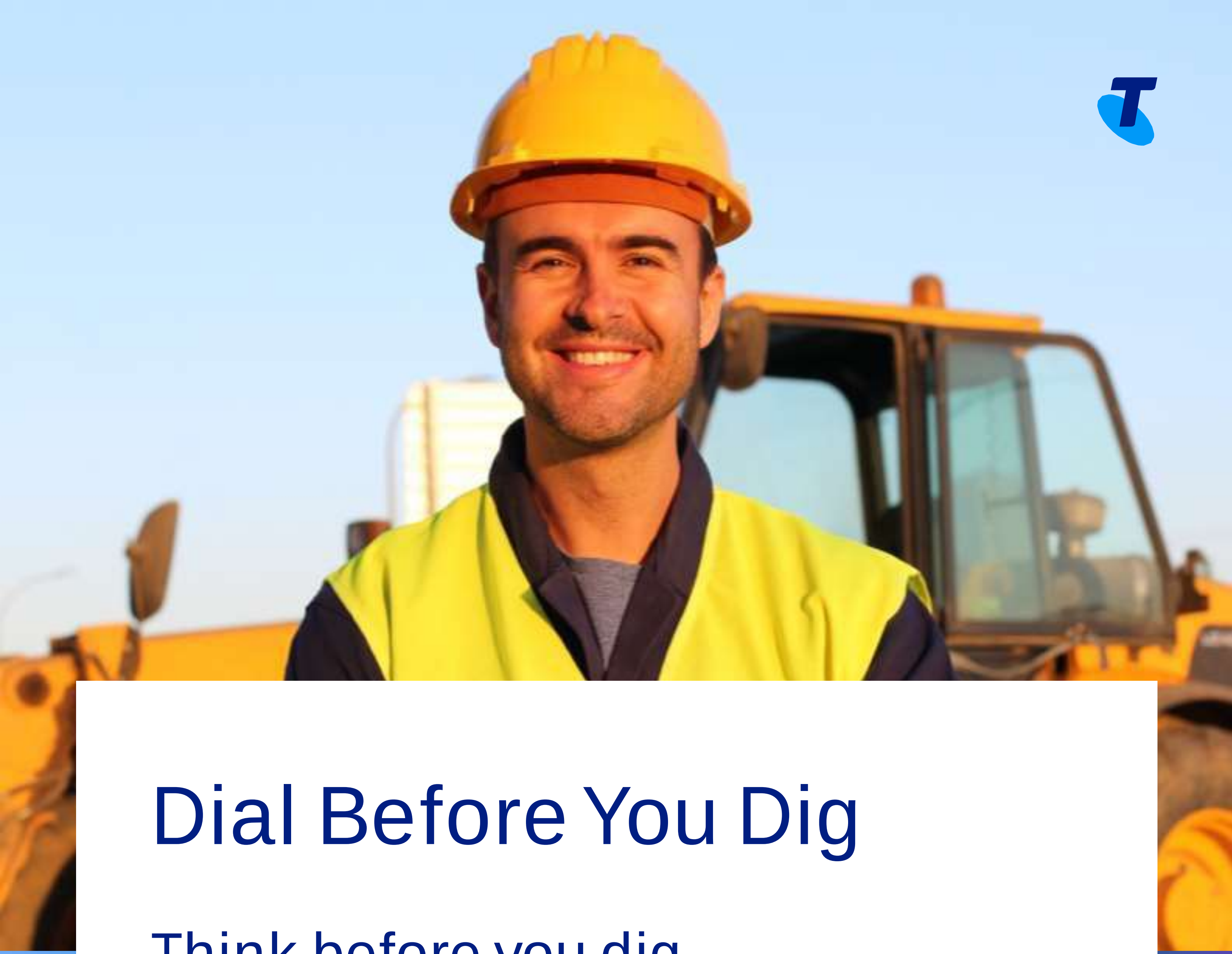
One 50mm PVC conduit (P50) containing a 50-pair and a 10-pair cable between two 6-pits. approximately 20.0m apart, with a direct buried 30-pair cable along the same route



AA - (cable information)
AB - (cable information)
BA - (cable information)

Two separate conduit runs between two footway access chambers (manholes) approximately 245m apart A nest of four 100mm PVC conduits (P100) containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along

WARNING: Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK. A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the assets are protected during construction works. The exact position of Telstra assets can only be validated by physically exposing them. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.



Dial Before You Dig

Think before you dig

This document has been sent to you because you requested plans of the Telstra network through Dial Before You Dig.

If you are working or excavating near telecommunications cables, or there is a chance cables are located near your site, you are responsible to avoid causing damage to the Telstra network.

Please read this document carefully. Taking your time now and following the steps below can help you avoid damaging our network, interrupting services, and potentially incurring civil and criminal penalties.

Our network is complex and working near it requires expert knowledge. Do not attempt these activities if you are not qualified to do so.

Your checklist

1. Plan

Plan your work with the latest plans of our network.

Plans provided through the DBYD process are indicative only*.

This means the actual location of our asset may differ substantially from that shown on the plans.

Refer to steps 2 and 3 to determine actual location prior to proceeding with construction.

2. Prepare

Engage a DBYD Certified Locating Organisation (CLO) via dbydlocator.com to identify, validate and protect Telstra assets before you commence work.

3. Pothole

Validate underground assets by potholing by hand or using non-destructive vacuum extraction methods.

Electronic detection alone (step 2) is not deemed to validate underground assets and must not be used for construction purposes.

If you cannot validate the Telstra network, you must not proceed with construction.

4. Protect

Protect our network by maintaining the following distances from our assets:

- 1.0m Mechanical Excavators, Farm ploughing, Tree Removal
- 500mm Vibrating Plate or Wacker Packer Compactor
- 600mm Heavy Vehicle Traffic (over 3 tonnes) not to be driven across Telstra ducts or plant
- 1.0m Jackhammers/Pneumatic Breakers
- 2.0m Boring Equipment (in-line, horizontal and vertical)

5. Proceed

You can proceed with your work only once you have completed all the appropriate preparation, potholing and protection.

Useful information

Report any damage immediately

https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment

13 22 03

If you receive a message asking for an account or phone number say "I Don't have one"
Then say "Report Damage" then press 1 to speak to an operator.

Relocating assets

If your project requires the relocation of a Telstra asset, please contact the Telstra Network Integrity Group:

1800 810 443 (AEST business hours only)

NetworkIntegrity@team.telstra.com

Never try to move or alter our network infrastructure without authorisation. By law, only authorised people can work on our assets or enter a facility owned or operated by us. Any interference, including unauthorised entry or tampering, may result in legal action.

Further information

Plan enquiries

1800 653 935 (AEST business hours only)

Telstra.Plans@team.telstra.com

Information on how to find cables and request asset relocations:

https://www.telstra.com.au/consumer-advice/digging-construction

Asset Plan Readers

PDF Adobe Acrobat Reader DC Install for all versions
DWF Download Design Review | DWF Viewer | Autodesk

Disclaimer and legal details

*Telstra advises that the accuracy of the information provided by Telstra conforms to Quality Level D as defined in AS5488-2013.

It is a criminal offence under the Criminal Code Act 1995 (Cth) to tamper or interfere with telecommunications infrastructure.

Telstra will also take action to recover costs and damages from persons who damage assets or interfere with the operation of Telstra's networks.

By receiving this information including the indicative plans that are provided as part of this information package you confirm that you understand and accept the risks of working near Telstra's network and the importance of taking all of the necessary steps to confirm the presence, alignments and various depths of Telstra's network. This in addition to, and not in replacement of, any duties and obligations you have under applicable law.

When working in the vicinity of a telecommunications plant you have a "Duty of Care" that must be observed. Please read and understand all the information and disclaimers provided below.

The Telstra network is complex and requires expert knowledge to interpret information, to identify and locate components, to pothole underground assets for validation and to safely work around assets without causing damage. If you are not an expert and/or qualified in these areas, then you must not attempt these activities. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers. The 5 P's to prevent damage to Telstra assets are listed above. Construction activities and/or any activities that potentially may impact on Telstra's assets must not commence without first undertaking these steps. Construction activities can include anything that involves breaking ground, potentially affecting Telstra assets.

If you are designing a project, it is recommended that you also undertake these steps to validate underground assets prior to committing to your design.

This Notice has been provided as a guide only and may not provide you with all the information that is required for you to determine what assets are on or near your site of interest. You will also need to collate and understand all of the information received from other Utilities and understand that some Utilities are not a part of the DBYD program and make your own enquiries as appropriate. It is the responsibility of the entities undertaking the works to protect Telstra's network during excavation / construction works.

Telstra owns and retains the copyright in all plans and details provided in conjunction with the applicant's request. The applicant is authorised to use the plans and details only for the purpose indicated in the applicant's request. The applicant must not use the plans or details for any other purpose.

Telstra plans or other details are provided only for the use of the applicant, its servants, agents, or Certified Locating Organisation. The applicant must not give the plans or details to any parties other than these and must not generate profit from commercialising the plans or details.

Telstra, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Telstra against any claim or demand for any such loss or damage.

Please ensure Telstra plans and information provided always remains on-site throughout the inspection, location, and construction phase of any works.

Telstra plans are valid for 60 days after issue and must be replaced if required after the 60 days.

Data Extraction Fees

In some instances, a data extraction fee may be applicable for the supply of Telstra information. Typically, a data extraction fee may apply to large projects, planning and design requests or requests to be supplied in non-standard formats. For further details contact Telstra Planned Services.

Telstra does not accept any liability or responsibility for the performance of or advice given by a Certified Locating Organisation. Certification is an initiative taken by Telstra towards the establishment and maintenance of competency standards. However, performance and the advice given will always depend on the nature of the individual engagement.

Neither the Certified Locating Organisation nor any of its employees are an employee or agent for Telstra. Telstra is not liable for any damage or loss caused by the Certified Locating Organisation or its employees.

Once all work is completed, the excavation should be reinstated with the same type of excavated material unless specified by Telstra

The information contained within this pamphlet must be used in conjunction with other material supplied as part of this request for information to adequately control the risk of potential asset damage.

When using excavators and other machinery, also check the location of overhead power lines.

Workers and equipment must maintain safety exclusion zones around power lines

WARNING: Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK. A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the assets are protected during construction works. The exact position of Telstra assets can only be validated by physically exposing them. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

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Appendix C

Data Quality Objectives

Data quality objectives
Preliminary Site Investigation
Carrs Drive, Yamba NSW

	DQO Process Step	Outputs of DQOs Process Step
1	State the problem – assemble an effective planning team, describe the problem and examine the resources for investigating the problem.	
1.1	Write a brief summary of the contamination problem.	The site is located at 110 – 120 Carrs Drive, Yamba and consists of approximately 17.6 ha of rural residential land. The site has primarily been used for cattle grazing, with some minor intensive agricultural activities undertaken in the 1960s and 1970s. A site history review and site inspection have identified various structures at the site, including a residential house fronting Carrs Drive, and a series of buildings/sheds in the north-eastern and central portions of the site. Diagonally behind the house there is a second order stream, which is to be retained as part of the proposed development. The contamination status of the stream is unknown. Potentially contaminating activities include: - potentially impacted fill underlying the buildings/sheds and paved surfaces; - herbicides and pesticides usage and storage during historical agricultural activities; - use and storage of petroleum related contaminants; - dumping of waste associated with ruarl farm and residential use; and - asbestos containing materials (ACMs) from structures located at the site. It is understood that the land is proposed to be developed into a manufactured housing estate, with the developable area encompassing approximately 10 ha. The development is reported to include the importation of material to raise the site elevation by 1.2 – 2.0 m, with the majority of site utility services to be installed within the vertical extents of the imported fill. Localised excavation into natural soils at depths < 5 m AHD will be required for some utilities, e.g. sewer rising mains. The western portion of the site is not proposed to be disturbed during

DQO Process Step	Outputs of DQOs Process Step
	development, and as such, intrusive investigations in this area are not proposed. As part of a pre-DA lodgement meeting with Clarence Valley Council (CVC), the meeting minutes[1] prepared by CVC included the following requirements, as relevant to this proposal: • *State Environmental Planning Policy No. 55 – Remediation of Land*: a preliminary site investigation is required to be submitted with the application demonstrating the land is suitable for residential use; and • Potential soil contamination: Due to the possible previous use of the land for agricultural/horticultural purposes it will need to be demonstrated that the site is suitable for its intended [use]; and • Acid Sulfate Soils: The subject land is identified as containing Class 2 Acid Sulfate soils on the Acid Sulfate Soils Map and is therefore subject to the provisions of Clause 7.1. An ASS management report must be prepared for the development and submitted with the DA. An investigation of the 120 Carrs Drive site was undertaken by Easterly Point in June 2021 and information obtained from this investigation will be used to refine the sampling plan. Of note, contamination was identified in various areas of the site, associated with specific features, e.g. oil drum and bare-earth storage shed. The investigation involved a limited site history review and limited sampling in targeted locations. Based on the results of the investigation, the following recommendations were made: – further investigation of Shed 1 based on the observed material stored within the shed, the bare earth floor and the elevated concentrations of total recoverable hydrocarbons (TRHs) detected in the area;

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[1] Clarence Valley Council (30 August 2021) *Pre-DA lodgement Meeting*, (Ref. DMU2021/0032).

DQO Process Step	Outputs of DQOs Process Step
	– further investigation into the source, nature and extent of the elevated TRHs detected near Shed 2; and – investigation into potential impacts in the area of the former dwelling in the north of the site, in particular for asbestos, given the age of the building and extensive fire that resulted in the building being burnt down. Clifton Yamba Land have requested a preliminary site investigation be undertaken to further assess previously identified areas of concern and to meet development application requirements.
1.2 Identify members of the planning team	Client – Clifton Yamba Land; Client representative– Andrew Smith, MDE; Acid sulfate soils consultant – Precise Environmental; and ASC Consultant – Hailey Spry of Easterly Point Environmental.
1.3 Develop/refine the conceptual site model (CSM), including a summary of the exposure scenarios.	Sources: - potentially impacted fill underlying the buildings/sheds and paved surfaces, including heavy metals, organics (TRHs, BTEX, PAHs and OCPs/OPPs[2]), and asbestos fibres/fragments; - OCPs/OPPs from herbicides and pesticides used and stored during historical agricultural activities; - petroleum related contaminants related to potential use and storage of oils and fuels in the sheds; - dumping of waste associated with agricultural farm and residential use; and - asbestos containing materials (ACMs) from structures located at the site. Receptors: The site is currently understood to be vacant and unused. The future receptors are considered to include; – future site construction/development workers;

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[2] Total recoverable hydrocarbons; benzene, toluene, ethyl-benzene, xylene(s); polycyclic aromatic hydrocarbons; organochlorine pesticides; organophosphorus pesticides.

DQO Process Step		Outputs of DQOs Process Step
		– future residents, considered to be residential receptors with minimal opportunities for soil access (HIL-B) in accordance with the NEPM (2013, B1); – future site visitors or site workers or maintenance staff; – on-site plants and animals; and – on-site and off-site ecological receptors, such as the onsite steam and Oyster Channel. Dermal contact, inhalation of dust and ingestion have been identified as the pathways of concern, as well as inhalation of vapours. Further assessment of groundwater and/or soil gas will be considered based on the findings of this investigation. It is highlighted that the current exposure pathways, e.g. construction and maintenance works are not considered to be the same as the proposed residential receptors given the importation of 1 – 2 m of fill across the site, i.e. no direct dermal contact, inhalation of dust and ingestion of soil.
1.4	Specify the available resources and constraints, such as relevant deadlines for the study, budget, availability of personnel and schedule.	The ASC practitioner has the available capacity to conduct the investigation using appropriate subcontractors including Precise Environmental and the laboratory. Site access has been arranged by MDE, however, access across the site will be constrained by the heavy vegetation across the site. The budget is controlled by the client, and a set fee has been agreed to based on Easterly Point's proposal dated 17/05/22.
2	Identify the goals of the study – identify the principal study question(s), identify potential alternative actions with implications, and combine these to make statements on the decision problem.	
2.1	Identify the principal study question(s).	Is the site suitable for the proposed land use? What is the nature and extent of previously identified contamination? If the site is not suitable for the proposed land use, what remedial works are required to make the site suitable?

	DQO Process Step	Outputs of DQOs Process Step
2.2	Identify the alternative outcomes or actions that could result from resolution of the principal study question(s).	– the site is suitable in its current state for the proposed land use, with additional sampling; or – the site is likely suitable in its current state for the proposed land use, with additional sampling and remediation/management.
2.3	For decision problems, combine the principal study questions and the alternative actions into decision statements.	If the site is likely suitable for residential landuse in its current state, no remediation or management is likely required. If the site is not suitable for residential land use in its current state, remediation and/or management may be required, taking into account the planned importation of fill across the site and the management of the site as a whole.
3	Identify information inputs – identify the information needed to formulate and investigate the problem, and confirm that appropriate sampling and analytical methods are available.	
3.1	Identify the information that will be required to resolve the decision statements/estimation, including existing information and new environmental data, and identify the sources for each item of information required.	Soil data collected as part of this investigation, including field samples and analytical samples. Standards and guidelines including NEPM (2013).
3.2	Identify the information needed to establish the action level.	Investigation criteria will be sourced from: – NEPM (2013) Schedule B1 HIL-B for high-density residential with inaccessible soils landuse.
3.3	Confirm that appropriate sampling and analytical methods exist to provide the necessary data.	Sampling and analytical methods will be consistent with existing guidance, including the NEPM (2013, B2 and B3). Analytical laboratories will be NATA accredited and use analytical methods based on NEPM, USEPA and APHA methods.
4	Define the boundaries of the study - define the target population, the spatial and temporal boundaries associated with the population, examine any practical constraints to collecting data, and factors that affect the selection of the unit which defines the scale of sampling and the scale of decision making or estimation.	
4.1	Define the target population of interest and its relevant spatial boundaries.	Does not appear the site has been filled, therefore natural soils will be targeted. Investigations will extend to a maximum depth of 1.5 - 2 m to ensure no fill is encountered at depth, however, if no fill is identified the surface

DQO Process Step	Outputs of DQOs Process Step
	soils will be targeted as the population of interest as the most likely portion for contamination. Shallow groundwater likely, therefore samples may only be able to be collected from top 0.5 m.
4.2 Define what constitutes a sampling unit.	Sampling units will consist of: – field samples of appropriately described and logged samples which are field screened; and – analytical samples of the laboratory specified sample jar quantity.
4.3 Specify temporal boundaries and other practical constraints associated with sample/data collection.	To achieve problem resolution in a timely manner, the field investigation is anticipated to be conducted in conjunction with Precise Environmental, who will be conducting the assessment of ASS, and is proposed to be conducted on 12 – 13/07/2022. Access approval has been organised by Andrew Smith of MDE. The site is vacant so no restraints relating to access. Access within the site may be problematic based on aerial photographs that show the site is heavily vegetated. Access via foot (not vehicle) most likely required to access most of the site. Inspections and sampling will only occur in the eastern portion of the site based on proposed development area and dense vegetation in western portion.
4.4 Specify the smallest unit on which decisions or estimates will be made.	The decision is to be based on the eastern portion of site where development is proposed. However, following data analysis, some form of segregation may be considered, i.e. stratifying the site into smaller areas of concern where contaminating activity is limited to a specific area and identified impacts fit the CSM, i.e. reasons the impact is only found in certain area. Based on the client's objectives to determine the sites suitability for high-density residential land use, a decision unit consists of the entire eastern portion proposed for development.

	DQO Process Step	Outputs of DQOs Process Step
5	Develop the analytic (statistical) approach - develop a logical "if …, then …, or …" statement that defines the conditions that would cause the decision maker to choose among alternative actions.	
5.1	Specify the statistical parameter that characterises the population of interest, such as mean, median, maximum, 95% upper confidence limit (UCL) of the arithmetic average, proportion, etc.	As targeted sampling is being conducted, no statistical analysis will be undertaken, noting the NSW EPA (2020) sampling design guidelines (draft) describe "Statistical determinations relating the sample data to the population parameter, such as estimating confidence intervals or conducting hypothesis tests, are only valid if the sample data is unbiased and independent. Consequently, data collected using judgmental designs are not suited for use in statistical determinations". Other than analysis of data, additional considerations will include: – potential leaching and groundwater impacts; – sampling density; – aesthetic requirements, including no odours or staining, no waste materials and no monolithic deposits as per the NEPM (2013, B2). Notwithstanding the above, data evaluation will include evaluation of: – any individual sample that exceeds 250% of the criteria.
5.2	Specify the action level for the decision.	Analytical action levels are to be based on the NEPM HILs (2013, B1).
5.3	Confirm that measurement detection will allow reliable comparisons with the action level.	Samples will be submitted to NATA accredited laboratories. The laboratories analytical LORs are suitably below the adopted criteria. Asbestos fibres at the required LOR is not NATA accredited.
5.4	Combine the outputs from the previous DQOs steps and develop an "if ..., then ..., else ..." theoretical decision rule based on the chosen action level.	If the statistical parameters (or aesthetics) of the sampling data exceed the HIL_B action levels, then remediation and/or management will be recommended otherwise, if the statistical (and aesthetic) parameters are within the applicable action levels, then the site will be determined meeting the HIL-B criteria, taking into consideration the limited sampling undertaken.
6	Specify performance or acceptance criteria - to specify probability limits for false rejection and false acceptance decision errors.	

	DQO Process Step	Outputs of DQOs Process Step
6.1	Specify the decision rule as a statistical hypothesis test.	The null hypothesis is that the site is contaminated and is not suitable for residential (res-B) land use. The alternative hypothesis is that the site is suitable for residential land use)res-B) with no management and/or remediation.
6.2	Examine consequences of making incorrect decisions from the test.	Possible decision errors include: – site being accepted as suitable for a HIL-B land use when it is not, thereby potentially risking human health or environmental impacts; and – the site being accepted as contaminated when it is not, enacting further assessments and imposing financial and resource burdens on the project unnecessarily, and resulting inappropriate classification.
6.3	Place acceptable limits on the likelihood of making decision errors, including acceptable alpha (α) and beta (β) risk levels.	Stated hypotheses: – null hypothesis (H_O): the maximum of any individual sample, (and other requirements), are > the action level; and – alternate hypothesis (H_A): the maximum of any individual sample, (and other requirements), are ≤ the action level. Potential outcomes include Type I and Type II errors: – Type I error of determining the site is not contaminated when in fact it is contaminated (wrongly rejects true H_O). – Type II error of determining the site is contaminated when in fact the site is not contaminated (wrongly accepts false H_O). For performance criteria, the acceptable limits on the likelihood of making decision errors to be applied are: – alpha risk (Type I error) of $\alpha = 0.05$; and – beta risk (Type II error) of $\beta = 0.2$.

	DQO Process Step	Outputs of DQOs Process Step
7	Optimise the design for obtaining data - to identify a resource effective sampling and analysis design for generating data that are expected to satisfy the DQOs.	
7.1	Document the final sampling and analysis design, along with a discussion of the key assumptions underlying this design.	The sampling strategy is not designed to meet the minimum sampling requirements as specified in EPA (1995) Sampling design guidelines. The sampling strategy is aimed at investigating previously identified areas of concern, and providing spatial coverage. As such, a judgemental sampling pattern will be adopted, with limited locations positioned in locations across the site, either targeted to features identified in Easterly point 2021 investigation or during the site inspection, as well as in locations to obtain broad site coverage. Further details regarding the sampling strategy are provided in the SAQP.
7.2	Detail how the design should be implemented, together with contingency plans for unexpected events.	The field methods for sample collection, handling, and analysis (at analytical laboratories) are described in the project-level standard operating procedures (SOPs). Contingencies include collecting additional samples from material which is significantly different from the previously identified and samples fill, and conducting additional analyses where field indicators (staining, odours, field screening results) suggest other contaminants.
7.3	Determine the quality assurance and quality control (QA/QC) procedures that are to be performed to detect and correct problems to ensure defensible results.	The required field QA, and the field and laboratory QC, are described in the project-level SOPs. These include both the data quality indicators (DQIs) and the associated measurement quality objectives (MQOs).
7.4	Document the operational details and theoretical assumptions of the selected design in the SAQP.	Theoretical assumptions include: – limited fill material is present across the site; and – the natural soils are relatively homogenous.

Appendix C

Easterly Point's field work procedures

Soil sampling - general **EPEFW-PR01**

1.0 Purpose and scope

Procedure for the collection of soil samples. This procedure is required to ensure that soil samples are collected in an appropriate and consistent manner, that the soil sampling is appropriate for the media and analytes, and to allow the documentation of standard operating procedures used for soil sample collection and handling.

This procedure is for sampling of in-situ and ex-situ soils and fills for general physical and chemical tests and analyses. Also for non-volatile, semi-volatile and volatile analyses.

2.0 Definitions

COC	chain of custody form;
WHS	work health and safety;
PID	photoionisation detector; and
VOCs	volatile organic compounds.

3.0 References

- NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Schedule A and Schedules B(1) – B(9)*, National Environment Protection Council.
- Massachusetts Department of Environmental Protection (MDEP) (1991) *Standard References for Monitoring Wells, Part I*, (Ref. WSC-310-91). Commonwealth of Massachusetts, Boston, MA.
- Environment Protection Authority (September 1995) *Contaminated Sites: Sampling Design Guidelines*. NSW EPA, Chatswood, NSW.
- Standards Australia (1997 *Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds (AS 4482.1-1997)*.
- Standards Australia (1999) *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances (AS 4482.2-1999)*.

4.0 General

Related environmental procedures include *EPESHE-PR06 Decontamination of sampling equipment*.

This procedure relates to the collection of soil samples using hand tools, push tubes, split spoon samplers, or augers. Where volatiles are a contaminant of concern, samples are not to be collected from auger flights. The exception is where OH&S considerations, e.g. potential for buried services, require auguring for the initial 0.5 m or similar.

In general samples should be collected at the surface, and at depth. They should be collected at regular intervals for consistent soil profiles (e.g. surface, 0.5 m, 1.0 m, 2.0 m etc.), or at changes in the soil profile (e.g. surface, A horizon, B horizon, etc.), or from the different layers where fill is present (e.g. surface, fill type 1, fill type 2, natural soils, etc.).

Sampling depths should ensure that the residual, natural soils are exposed/sampled to a reasonable depth, e.g. 0.3 - 0.5 m. If due to refusal by the sampler or exceedance of equipment reach, this cannot be achieved, the geological log should clearly document the reason sampling was discontinued and that fill material continues to greater depths.

Surface samples should be 0 - 0.10 m or 0 - 0.15 m and samples from depth should be less than 0.3 m, to avoid compositing effects. (Some landuses may require shallower surface samples, e.g. banana lands 0.075 m, and this should be established as part of the DQOs process). Where thinner layers or horizons exist, the sample size should be reduced accordingly, and no sample should consist of multiple layers/horizons/strata.

5.0 Procedure

5.1 Sample collection

Clean, disposable gloves are to be used for each sample by all personnel who will contact the soil. This is to prevent both exposure to contaminants and cross-contamination of samples. Any sampling equipment is to be de-contaminated before use.

5.1.1 Sample transfer

Once collected, samples are to be transferred immediately to the appropriate sample container, ensuring that the container is filled to the top and that no head-space remains.

5.1.2 Hand tools

Refers to samples collected from the land surface, walls and floors of test pits or excavations, stockpiles, etc. Hand tools include spatulas, trowels, shovels, spades, etc.

The surface to be sampled is first to be cleaned of any organic material, e.g. grass and roots, and the sample collected from fresh, exposed soil. The soil should be exposed to remove any smear affects from the sampling equipment, and to ensure any exposed surfaces which may not be representative of contamination are removed, e.g. where release of volatiles may have occurred from the exposed soil.

5.1.3 Test pits

Test pits or excavations less than 1m depth are not to be entered unless appropriate assessment of stability has been conducted and documented. Test pits over 1 m depth are not to be entered.

Where test pits or excavations cannot be entered for WHS reasons, sampling from excavator buckets is permissible, providing the following controls are observed:

- the excavator bucket is decontaminated between sample locations;
- the sample is collected from the centre of the bucket; and
- the sample is collected from the interior of soil clods or a mass of uncohesive material which is undisturbed and has not contacted the excavator bucket.

The sampler should direct the excavator operator as to where the sample is to be collected, and, where volatiles are a contaminant of concern, screen the bucket with a PID prior to sampling.

5.1.4 Soil cores

For push tubes, split spoons, etc., samples should be transferred directly to the sampling container.

5.1.5 Augers

Samples should be collected from the auger with a trowel, by cutting away the outside and collecting soil from the centre of the auger bit. Samples should then be transferred directly to the sampling container.

5.1.6 Field screening for VOCs

If volatiles are a contaminant of concern and field screening using a photo-ionisation detector (PID) is required, a sample should also be transferred to a ziplock plastic bag.

5.1.7 Composite sampling

Composite sampling is used to reduce analytical costs and involves the bulking and thorough mixing of soil samples (collected as above), to form one composite sample for laboratory analysis. Generally, the samples should be sent to the laboratory for compositing, with appropriate instructions recorded on the COC.

Composite sampling must comply with the following rules:

- volatile substances, including BTEXN compounds and TRHs C6 – C10 are not suitable for composite sampling;
- samples to be composited must be collected from the same soil/fill horizon;
- soil with high clay content is not suitable for composite sampling;
- no more than 4 sub-samples should be included in a composite sample; and
- the sub-samples should be equal in size, from immediately adjacent sampling points, evenly spaced, and composited laterally.

5.2 Sample containers

Sample containers are to be decontaminated, clean and dry, and of the appropriate size and material. They are to include the appropriately preservative if required, and to have gastight, non-absorptive seals, which allow no head-space. Generally this is achieved using laboratory-supplied 125 mL to 250 mL clear glass jars. The laboratory should be contacted if numerous and/or specialty analytes are required, to confirm appropriate size or type of jar/s required.

5.3 Sample labelling

Samples should be labelled clearly on the outside wall of the container and the sample number should also be provided on the container lid. All labelling should be with waterproof pens/markers.

The following is to be included on the label:

- sample ID;
- project ID;
- date; and
- sampler's initials.

Sample ID must be a unique and logical identifier. This may include one of the following:
SL for sample location;
TP for test pit;
BH for borehole; or
MW for monitoring well.

The Sample ID needs to be be followed by the Sample location number, and either the sample depth or a letter, e.g. SL01-0-0.15 or TP03-A.

Duplicate samples are not to be labelled "duplicate" etc., and are to conform to the sample ID system used, e.g. if there are six sample locations, duplicates should be labelled as the seventh, etc.

5.4 Sample handling, storage and dispatch

The soil jars, once filled with sample, are to be wiped clean (after rinsing with clean water if necessary) to avoid contamination of the eskies or people later handling the samples. They are to be wrapped in bubble wrap/padding, and immediately placed in an esky containing frozen ice-blocks. Eskies should be kept out of direct sunlight, hot vehicles, etc., as far as practical.

A Chain of Custody (COC) form is to be filled out and the COC is to be sent with the sample/s to the laboratory. The COC/s is to be placed in a ziploc plastic bag or plastic folder. All samples sent to the laboratory are to be included on the COC/s, and if no analysis is required, marked as "Hold".

If additional air space exists in the esky, this should be filled with scrunched-up newspaper or bubble wrap or similar. Eskies are to be secured with heavy tape and security seals, and clearly show the laboratory's contact information and Easterly Point contact information.

All samples, including QC samples, are to be transported to the primary and secondary laboratories. If transportation is by courier, eskies are not to be dispatched on Fridays (or days before public holidays) unless delivery the next day has been organised.

If samples cannot be dispatched on the day of sampling, with refreshed ice-blocks or ice for over-night transport, then the samples are to be refrigerated until dispatch. The laboratory should be contacted if any delays to dispatch occur, to confirm appropriate time is available for extraction/analysis based on holding times.

5.5 Sample location logging

A geological log is to be completed for each sample location by a qualified environmental scientist/engineer. Logs are to be completed for all sample locations, including for surface samples and ex-situ samples.

The log is to record the following data:

- job details, date, location, methods, climatic conditions, etc.;
- sample number and depth;
- soil classification (material type and texture), colour, consistency or density, inclusions, odour, staining, presence of artefacts, moisture content, etc.;
- filed measurements results;
- depth of excavation/drilling;
- excavation/drilling refusal;
- depth water inflow and/or groundwater level, if encountered, and comments regarding water if required; and
- any other relevant field observations.

5.6 QA documentation

A COC is to be completed for all samples to be analysed (including physical test parameters such as particle size analysis, etc.), and for all samples to be sent to the laboratories. Samples not to be analysed should be described as "Hold".

The COC is to detail the following information:
- laboratory reference numbers, if available (including quotes);
- site identification;
- the samplers' initials;
- nature of the sample;
- collection time and date;
- analyses to be performed;
- sample preservation method;
- any relevant comments, e.g. level of contamination expected;
- level of quality control required; and
- dispatch information and signature.

5.7 QC samples

QC sampling is project-specific and may vary based on the DQOs. In general, the following should be collected as a minimum:

Quality control sample	Frequency
Field duplicates	≥ 10% or 1 if < 10 samples
Inter-laboratory duplicates	≥ 5% or 1 if < 20 samples
Rinsate samples	≥ 1/field batch
Trip blanks	≥ 1/field batch (volatiles)
Trip spikes	≥ 1/field batch (volatiles)

Trip spikes and trip blanks are laboratory prepared and should be organised through the laboratory prior to conducting the field work. Trip spikes and trip blanks should be held for as little time as possible prior to the field work and should be refrigerated prior to the field work. After sample collection, trip spikes and trip blanks are to be handled as a primary sample and should also be included on the COC.

Personal protective equipment EPESHE-PR02

1.0 Purpose and scope

To determine a procedure for the safe and proper use of personal protective equipment. This procedure should apply to all personnel working in potentially contaminated areas and is for the safety and protection of the workers.

2.0 Definitions

LEL	lower explosive limit
PID	photo-ionisation detector
PPE	personal protective equipment
OBZ	operators' breathing zone

3.0 References

- US Department of Health and Human Services (1985) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.* US Department of Health and Human Services, Washington D.C.

4.0 Procedure

All personnel must be provided with appropriate personal protective equipment (PPE) which meets Australian standards for health and safety.

Personnel must be properly trained in the use of, safety and how to wear PPE prior to undertaking site work.

PPE must be worn in accordance with Table 1.

Table 1: Conditions requiring personal protective equipment

Conditions	Level of PPE	PPE required
All work sites		Safety boots. Long shirts and pants. SPF 30+ sunscreen and sunhat. Hard hats if machinery onsite or overhead hazards are identified in JSA. High visibility shirt / vest / coat (orange only for rail works). If wearing a hi-vis vest, it must NOT be removed when putting on hi-vis rainwear or overcoat.
All site works associated with potentially contaminated areas.	Level D	Modified Safety boots. Long shirts and pants. SPF 30+ sunscreen and sunhat. Hard hats if machinery onsite or overhead hazards. High visibility (Hi viz) vests (orange only for rail works). Complete Disposable suit or cotton coveralls if required. Disposable gloves and outer gloves if required. Safety glasses if required. Hearing protection if required.

Conditions	Level of PPE	PPE required
See Table 2	Level C	Level D PPE. Tape seals for outer glove and boots. Air purifying respirator with organic vapours and particulate filter cartridge.

The level of protection required in the exclusion zone is determined in accordance with Table 2 and is expected to be Level D or Level C.

4.1 Action levels

The action levels indicate when PPE should be worn, and when Level D protective clothing should be upgraded to Level C. Calibration and air monitoring data should be recorded on an appropriate monitoring form or site diary. Contaminant values which are in excess of established airborne action levels appropriate for the prescribed level of protection should be addressed immediately.

4.2 Air monitoring action levels

The monitoring criteria and action levels shown in Table 2 have been established to protect against exposure to volatile organic compounds. Monitoring is to be conducted with an appropriately calibrated PID for the times shown in Table 2.

Table 2: Photo-ionisation detector (PID) readings

Analyser Reading	Location	Time Period	PPE and Action
Background	Working Face	At all times	Level D protection, continue monitoring.
> Background, but < 5 ppm	OBZ	> 1 minute	Level D protection, monitor OBZ.
> 5 ppm and < 50 ppm	OBZ	> 1 minute	Level C protection, continue monitoring.
> 50 ppm	OBZ	Instantaneous (~ 10 seconds)	Stop work and move upwind while vapours dissipate. If elevated levels remain, cover spoil, evacuate upwind and revise work methods or procedures.

Respirators should be donned whenever any chemical odours are detected, including petrol-like odours, coal tars, creosotes, phenols, naphthalene (mothballs) or hydrogen sulfide (rotten egg gas). It is important to note that air purifying respirators will not protect against cyanide.

4.3 Limitations of protective clothing

The PPE selected are expected to provide protection against the types and concentrations of hazardous materials that may potentially be encountered. However, no protective garment, glove or boot is resistant to all chemicals at any concentration. In fact, chemicals may continue to permeate or degrade a garment even after the source of contamination is removed. In order to obtain optimum usage from PPE, the following procedures should be followed by all workers.

When using disposable coveralls, don a new clean garment each day, or when the overalls are visibly soiled.

Inspect all clothing, gloves and boots both prior to and during use for:

- imperfect seams;
- non-uniform coatings;
- tears, rips, cuts, etc.; and
- poorly functioning closures.

Inspect reusable garments, boots and gloves both prior to and during use for:

- visible signs of chemical permeation such as swelling, discoloration, stiffness or brittleness; and
- cracks or any signs of puncture.

Any reusable garments exhibiting any such characteristics should be discarded.

Decontamination of personnel EPESHE-PR04

1.0 Purpose and scope

Procedure for the safe decontamination of personnel. This procedure is required to minimise workers' exposure to potential contaminants and to prevent the off-site transport of contaminants.

2.0 General

Decontamination must be conducted before breaks, at the end of the workday or before leaving the contaminant reduction zone for any reason. It is important to note that dermal contact, ingestion and inhalation are the main exposure pathways for contaminants, and decontamination should be conducted before any hand-to-mouth behaviour, e.g. eating, drinking and smoking.

The decontamination area should be established before commencing works and is to include plastic sheeting, grated boot wash, tubs of clean water with detergent, tubs of clean rinse water, soap, scrubbing brush, towels, etc. and lined garbage containers.

3.0 Procedure

The following procedure is to be followed:

- remove disposable booties (if used) and place in plastic garbage bag for disposal;
- wash boots with detergent solution and rinse with clean water;
- wash outer gloves in detergent solution and rinse in clean water. Remove outer gloves and place into plastic garbage bag for disposal or retain for subsequent reuse;
- remove disposable coveralls, taking care to prevent the release and dispersion of dusts which may have accumulated on the coveralls during on-site operations and place coveralls into a plastic garbage bag;
- if non-disposable coveralls are used, place coveralls into laundry bag;
- remove respirator (if used) and place spent filters into a plastic garbage bag. Place the respirator into a separate plastic bag for later cleaning and disinfection. Respirators must be disinfected daily, if used;
- remove inner gloves and place in plastic garbage bag for disposal; and
- thoroughly wash hands and face.

Plastic sheeting and all disposable items placed in plastic garbage bags are to be removed at the end of each workday. Plastic sheeting should be rolled up and placed in plastic garbage bags. All potentially contaminated material must be disposed of in an appropriate manner.

Decontamination of sampling equipment EPESHE-PR06

1.0 Purpose and scope

Procedure for the decontamination of sampling equipment. This procedure is required to ensure that samples are representative of the media sampled by preventing cross-contamination of samples, and to allow the documentation of standard operating procedures used for decontamination of sampling equipment.

2.0 General

All equipment to be used for direct sampling of environmental media is to be decontaminated before sampling and between samples. This includes all non-disposable equipment, e.g. spatulas, trowels, spades, shovels, auger bits, push tubes, split spoons, pump tube, bailers, etc.

Clean, disposable gloves are to be used by all personnel who will contact the sampling equipment. This is to prevent both exposure to contaminants and contamination of equipment.

3.0 Procedure

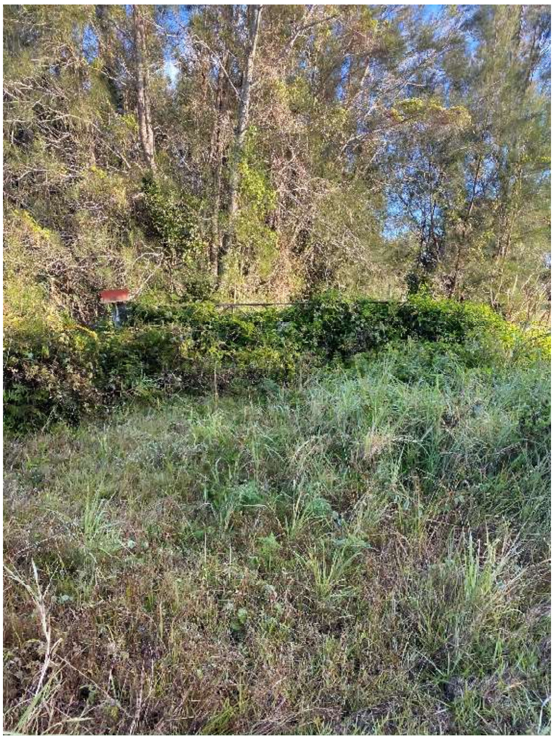
Decontamination of all sampling equipment is to be carried out as follows:
- scrape and remove all visible earthen materials, where possible;
- water scrub and rinse with clean water, where possible;
- scrub with appropriate detergent solution; and
- rinse with clean water;
- repeat if necessary.

Collect scraped soil materials and place in appropriate location, pre-agreed with the client. Other wastes must be placed into plastic garbage bags for waste collection.

Rinsate from decontamination is not to be discharged to stormwater or sewer but should be collected for appropriate testing and disposal at a licensed facility, if required. Plastic sheeting should be rolled up and placed in plastic garbage bags. All potentially contaminated material must be disposed of in an appropriate manner.

Appendix C

Photographs



Photograph 1: Former driveway along northern boundary of 120 Carrs Drive.

Photograph 2: 120 Carrs Drive, looking north the former cattle loading ramp, with Carrs Drive on the RHS

Photograph 3: 120 Carrs Drive. Fire pit behind residential house which can be seen in the background.

Photograph 4: 120 Carrs Drive. Timber stockpile near the residential house.

Photograph 5: 120 Carrs Drive. Shed 1 under trees.

Photograph 6: 120 Carrs Drive, within shed.

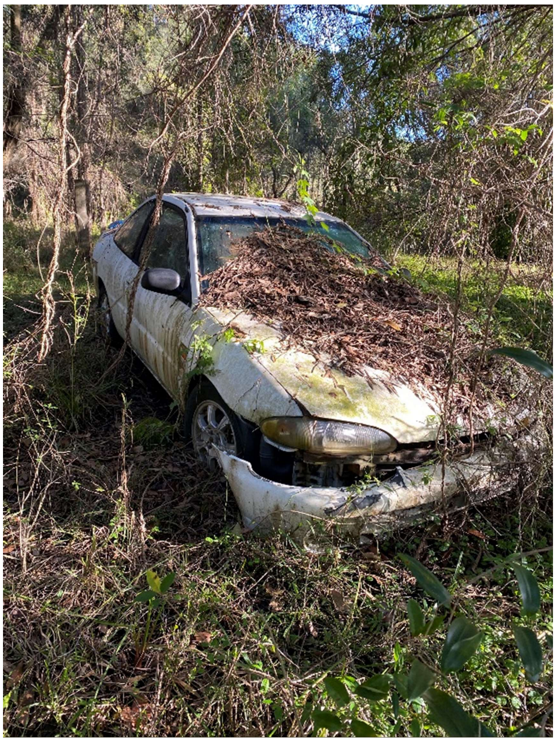
Photograph 7: 120 Carrs Drive, within shed, looking south-east.

Photograph 8: Oil drum on metal structure. Oil staining and dead grass can be seen surrounding the drum.

Photograph 9: Standing behind Shed 1 looking over barbed wire fence towards the stream

Photograph 10: Stream. Photograph taken immediately west of Shed 1.

Photograph 11: Area of northern structures. BH07, located adjacent to concrete slab. Burnt timber can be seen in the black clay.



Photograph 12: Area of northern structures. Abandoned car.

Photograph 13: Area of northern structures. Former greenhouse. The development off-site to the norther can be seen in the background.

Photograph 14: Area of northern structures. Brick stockpile.

Photograph 15: Area of northern structures. Unfinished structure on high wooden stilts/ foundation.

Photograph 16: Area of northern structures. Assumed former carport.

Photograph 17: Area of northern structures. Open shed with various waste.

Photograph 18: Area of northern structures. Example of waste scattered around the area, including dangerous goods storage container

Photograph 19: Area of northern structures. Example of waste scattered around the area, including rusty fuel drum.

Photograph 20: 110 Carrs Drive. Water can be seen pooled on the surface.

Photograph 21: 110 Carrs Drive. Vegetation stockpile.

Photograph 22: ASSBH07. Typical profile encountered, being black clays overlying saturated white sand.

Photograph 23: Drilling at location, ASSBH14.

Photograph 24: 110 Carrs Drive, looking west. Former driveway along LHS of photograph and southern boundary along treeline.

Photograph 25: Area of "Shed 2". Timber workbench, location of BH02.

Photograph 26: Shed 2.

Photograph 27: BH03. Shed 2 and associated features can be seen in background, including Shed 2 and IBC.

Appendix D

PID calibration records

TR techrentals

Calibration Record Form

Model:	**RAE,MINIRAE3000+**
Description:	**Handheld VOC Monitor**
Serial No.:	**592-927165**
Asset:	**203936**

Range	Source	Tolerance	Reading	Pass/Fail
-	Fresh Air	-	0.0ppm	Pass
100ppm Isobutylene	Lot No 236360 Exp Date Mar 2023	2%	100ppm	Pass

Worksheet No.:	606131
Location:	TR BRI
Calibration Date:	22/06/2022
Comments:	

Completed by:	Arthur XIE	**Signed:**		**Date:**	22/06/2022

Appendix E

Data usability

Background to data usability

1.0 Introduction

Information generated from environmental investigations requires some statement in regard to the usability of the data[1], and therefore quality assurance (QA) and quality control (QC) are an integral part of the analysis and interpretation of environmental data. QA/QC used in contaminated sites investigations is briefly reviewed in this section.

Quality assurance involves all of the planned and systematic actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples collected for analysis, and accuracy and reliability of the analytical results (NEPC 2013). Quality control is the component of QA which monitors and measures the effectiveness of other procedures by the comparison of these measures to previously decided objectives.

There are various components of QA/QC which address the operation of the laboratories and the routine procedures conducted to achieve a minimum level of quality. Examples of QA components include sample control, data transfer, instrument calibration, staff training, etc. Examples of QC components include the measurement of samples to access the quality of reagents and standards, cleanliness of apparatus, accuracy and precision of methods and instruments, etc. Generally, the management of laboratory QA issues is addressed through accreditation by the National Association of Testing Authorities (NATA), or similar, and monitoring of these issues is not addressed on a project by project basis.

On a project specific basis, those involved in collecting, assessing or reviewing the relevant data should ensure the minimum level of QA is conducted. Appropriate numbers and types of QC samples should be collected and analysed, both field QC samples and laboratory QC samples. While minimum levels of QA/QC are specified in some guidelines, e.g. AS 4482.1-1997, CRC Care 2013, NEPC 2013, the minimum level required may vary between projects, based on site and project specific aspects. This means that the minimum specified requirements may not be sufficient for a particular project. As described in the NEPM (NEPC 2013):

> *As a general rule, the level of required QC is that which adequately measures the effects of all possible influences upon sample integrity, accuracy and precision, and is capable of predicting their variation with a high degree of confidence.*

An individual QA/QC assessment should be applied to all media sampled, e.g. soil, groundwater, soil vapour, etc. to determine if the data for each media sampled is acceptable based on the project specific objectives. CRC Care 2013 describes that:

> *Quality assurance and quality control (QA/QC) procedures should be implemented in every step of the assessment process to ensure the collection of data of acceptable quality.*

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[1] To avoid confusion with the data quality objectives (DQOs) process, the term data usability is used rather than data quality.

2.0 PARCC parameters

Following receipt of laboratory analytical results, data validation is conducted to determine if the specified acceptance criteria have been met. This is conducted to ensure that all data, and subsequent decisions based on that data, are technically sound. Data quality is typically discussed in terms of precision, accuracy, representativeness, comparability and completeness. These are referred to as the PARCC parameters[2]. Field QA/QC and laboratory QC is described below within the PARCC framework.

2.1 Precision

2.1.1 Duplicates

Precision is a measure of the reproducibility of results under a given set of conditions and is assessed on the basis of agreement between a set of duplicate results obtained from duplicate analyses. The precision of a duplicate determination is measured by comparing the difference between the two samples to the average of the two samples, expressed as a relative percentage difference (RPD).

The determination is:

RPD = (P-D)/(P+D/2) x 100

P = primary sample
D = duplicate sample

Three types of duplicates are commonly used:

- field duplicates are used to measure the precision of the sampling and analytical process;
- inter-laboratory duplicates are used to check on the analytical performance of the primary laboratory; and
- laboratory duplicates are used to measure the precision of the analytical process.

Field duplicates are the main type of duplicates used in soil vapour assessments.

2.1.2 Field Duplicates

Field duplicates (or blind replicates) are collected from the same location and submitted to the laboratory for analyses, as a primary sample. The sample nomenclature is such that the laboratory is not aware which sample is a duplicate. The RPD is calculated to determine the degree of repeatability (precision) of results obtained from the duplicate analysis. Where results are below the practical quantification limit (PQLs) or limits of reporting (LORs), i.e. non-detects, RPDs cannot be calculated. Where one result is detected, the results are considered to conform when the detected result is less than five times the PQL/LOR.

The PQL/LOR is the lowest concentration of an analyte that can be determined with acceptable precision (repeatability) and accuracy under the test conditions. The PQL/LOR is usually calculated as five times the lower limit of detection (or method detection limit). However, adjustments in PQLs/LORs may be required due to interference from high contaminant concentrations.

As environmental samples can exhibit a high degree of heterogeneity, field duplicates often exceed the acceptance criterion, particularly if the samples are co-collected, for example, because of the potential for losing volatiles during sample splitting. It is generally accepted that before results which fail the acceptance criterion are described as due to low concentrations or sample heterogeneity, the sample should be re-analysed. This may not be necessary when the analytical results are significantly less than the landuse criteria.

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[2] The PARCC parameters are sometimes referred to as data quality indicators (DQIs).

2.1.3 Inter-laboratory duplicates

Inter-laboratory duplicates (or split samples) are field duplicates which are sent to a second laboratory and analysed for the same analytes and, as far as possible, by the same methods. These provide a check on the analytical performance of the primary laboratory.

2.1.4 Laboratory Duplicates

Laboratory duplicates (or check samples) are field samples which are split by the laboratory and thereafter treated as separate samples. The RPD is calculated to determine the degree of repeatability (precision) of results obtained from the duplicate analysis.

USEPA (1994) specifies that for inorganics, if the results for laboratory duplicates fall outside of the recommended control limits for a particular analyte, all results for that analyte, in all associated samples of the same matrix, should be qualified as an estimated quantity. For organics, USEPA (1999) does not specify recommended actions for laboratory duplicates.

2.2 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. Inasmuch as the true sample concentrations are not known, the determination of accuracy is achieved through the analysis of known reference materials or assessed by the analysis of matrix spikes. Spiking of reference material into the actual sample matrix is the preferred technique because it provides a measure of the matrix effects on the analytical recovery.

Accuracy is measured in terms of percentage recovery as defined by:

$$\%R = ((SSR - SR) / SA) \times 100$$

%R = percentage recovery spike
SSR = spiked sample result
SR = sample result
SA = spike added

For soil vapour assessments, accuracy is also determined through the use of suitable sampling methods, e.g. suitable flow rates, and checks on the system, e.g. leak testing.

2.2.1 Matrix spikes/matrix spike duplicates

These are samples prepared in the laboratory by dividing a sample into two aliquots and then spiking each with identical concentrations of specific analytes. The matrix spike (MS) and matrix spike duplicate (MSD) are then analysed separately and the results compared to determine the accuracy and precision of the analytes.

2.2.2 Surrogate spikes

Surrogate spikes provide an indication of analytical accuracy. They are used only for analyses which use gas chromatography and are compounds which are similar to the organic analytes of interest in chemical composition, extraction and chromatography, but which are not normally found in field samples. Surrogates are generally spiked into all sample aliquots prior to preparation and analysis. If the surrogate spike recovery does not meet the prescribed acceptance criteria, the samples should be re-analysed.

2.2.3 Laboratory control samples

Laboratory control samples (quality control check samples) are laboratory prepared samples of an appropriate clean matrix (i.e. sand, distilled water, air) which are spiked with known concentrations of specific analytes. The laboratory control sample (LCS) is then analysed and the results are used to assess sample preparation and analytical accuracy, free of matrix effects. Certified reference material (CRM) is another form of LCS, and involves the analysis of a known standard as part of the laboratory batch, e.g. British Columbia sediment samples for analysis of metals.

2.2.4 Flow rates

To minimise the potential for desorption of contaminants from soil to soil vapour in the sampling zone, sample flow rates should be selected so they are appropriate for the soil type (NEPC 2013). CRC Care 2013 (Box 5.4) recommends flow rates should be within the range of 10 mL/min – 500 mL/min, however lower sample flow rates, e.g. < 0.2 L/min, may be more appropriate where soil vapour samples are collected from low permeable soils.

2.2.5 Leak testing

Leak testing is required to demonstrate that actual soil gas was sampled, and not ambient air drawn in through the system.

CRC Care 2013, Appendix F1, describes that "when quantitative soil vapour data are desired, for example for risk assessments, leak testing the system as a quality measure is strongly recommended. Leaks in the sample train or leaks of ambient air into the probe tubing can result in diluting the soil vapour samples with ambient air and will result in underestimating actual contaminant concentrations".

There are generally two following methods of leak detection recommended:

1) Performing a "shut-in" test of the sampling train and applying a leak detection compound to the vapour probe at the surface; or

2) Applying a tracer gas over the probe and over the entire sampling apparatus. i.e. a shroud.

2.3 Representativeness

Representativeness refers to the degree to which the samples reflect the site specific conditions. It is primarily dependent on the design and implementation of the sampling program, with representativeness of the data being partially ensured by the avoidance of cross-contamination, adherence to sample handling and analytical methods, use of field duplicates, ensuring that samples do not exceed holding times prior to analysis, use of chain-of-custody forms and other appropriate documentation.

There are a number of QC samples which can be collected to assist in the qualification of representativeness, including:

2.3.1 Rinsate/equipment blanks

Used to determine if sampling equipment has been adequately decontaminated to ensure that cross-contamination between samples has not occurred. The frequency for rinsate blanks is one per piece of equipment per day (AS 4482.1-1997), however it should be noted that cross-contamination will bias samples upwards, and the frequency should therefore be at the investigator's discretion.

Rinsate blanks are generally referred to as equipment blanks in soil vapour assessments, where purified gas (air, nitrogen) is collected through the sampling system to test for the presence of contaminants introduced by the sampling method (CRC Care 2013).

2.3.2 Trip blanks

Used only when volatile organics are sampled to determine if transport in motor vehicles or similar has resulted in contamination of the samples. For trip blanks, a sufficient number should be analysed to allow the representativeness of the sampling to be determined. However, it should be noted that cross-contamination will bias samples upwards, and the frequency should therefore be at the investigator's discretion.

2.3.3 Trip spikes

Used only when volatile organics are sampled to attempt to quantify loss of volatiles during the analytical process. For trip spikes, a sufficient number of samples should be analysed to allow qualification of the likely loss of volatiles during the field sampling.

2.3.4 Laboratory blanks

Laboratory blanks (or method blanks, or analysis blanks) are used to verify that contaminants are not introduced into the samples during sample preparation and analysis. The NEPM (NEPC 1999) specifies that laboratory blanks should be conducted at a frequency of "at least one per process batch". The acceptance criterion for laboratory blanks is non-detect at the PQL/LOR.

2.3.5 Purge volumes

The sample probe, tubing and equipment all have an internal volume that must be purged prior to sampling to ensure that only soil vapour is sampled and that the data obtained is representative (NEPC 2013).

NEPC 2013 describes that "generally, three to four system volumes should be purged where flow rates allow and as long as the purge volume is not too large". CRC Care 2013 (Box 5.4), however, describes a minimum of one volume should be purged prior to sampling, including sample tubing and well head volume, i.e. sand pack. Regardless of the calculation used to estimate the purge volume and number of system volumes purged, this should be clearly documented and consistent for all sample locations and where repeat sampling is undertaken for comparative purposes.

Purging should also occur at a rate similar to that used for sampling.

2.3.6 Equilibration time

In-situ soil vapour can be displaced, and a period of time is required following installation for the soil vapour to re-equilibrate. The equilibration time between installation of the sampling probe and sampling should be based on drilling method, probe type and data quality objectives (DQOs).

For example, for probes where tubing is buried in a sandpack in the ground the equilibration time is approximately 8 hours. CRC Care describes that "to obtain data for risk-decision making in Australia, it is preferred that the soil vapour probes consisting of tubing buried in a sand pack be allowed to equilibrate for a least 24 hours before sampling. However, if sampling time is more constrained it is acceptable to sample after a shorted period of time (e.g. 8 hours) provided the wells were installed during dry weather conditions (i.e. not in the rain where the installation allowed for the movement of rainfall down to the probe sample depth) and stabilised parameters (oxygen, carbon dioxide and PID levels) can be clearly demonstrated".

2.4 Comparability

Comparability is a qualitative parameter designed to express the confidence with which one data set may be compared with another, including established criteria. Comparability is maintained by using consistent methods and ensuring that PQLs/LORs are below the relevant criteria.

2.5 Completeness

Quality control sample completeness is defined as the number of QC samples which should have been analysed, compared to the actual number analysed. If the appropriate number of QC samples are not analysed with each matrix or sample batch, then the data reviewer should use professional judgement to determine if the associated sample data should be qualified.

Completeness also refers to the complete and correct inclusion of field/sample documentation and laboratory documentation.

For soil vapour assessments documentation should include oxygen, carbon dioxide and methane readings, either measured in the field using field equipment or in the laboratory. CRC Care 2013, Appendix H, describes that stabilised PID and LEL readings, as well as oxygen, carbon dioxide and methane, should be measured before and after sampling.

Soil vapour data should also be assessed based on the specified margins of safety (MOS), described in either Box 5.8/5.9, CRC care 2013.

2.5.1 QC sample frequency and criteria

Based on EPA made or approved guidelines, the following QC samples are required for all contaminated site investigations, unless otherwise specified as part of the DQOs process review. All data to be used for validation should conform as a minimum to the requirements specified, regardless of minimum sample size.

Quality control sample	Frequency	Results[1]
Precision		
Field duplicates	≥ 5%	≤ 30 - 50%[2]
Inter-laboratory duplicates	≥ 5%	≤ 30 - 50%[2]
Laboratory duplicates	≥ 10%	Lab specified[3]
Accuracy		
Surrogate spikes	Organics by GC	70 – 130%[4]
Matrix spikes (MSs)	≥ 1/media type	70 - 130%[5]
Laboratory control samples (LCSs)	≥ 1/lab batch	70 - 130%[6]
Certified reference material (CRM)	LCS for metals	Lab specified[7]
Representativeness		
Rinsate samples	≥ 1/field batch	< LOR
Trip blanks	≥ 1/field batch (volatiles)	< LOR
Trip spikes	≥ 1/field batch (volatiles)	70 - 130%, ≤ 30 - 50%[8]

Quality control sample	Frequency	Results[1]
Laboratory blanks	≥ 1/lab batch	< LOR
Field blanks	≥ 1/field batch[9]	< LOR

Table notes:

1. Where results are laboratory specified, the laboratory analytical reports should be consulted for specific information.
2. Relative percentage differences (RPDs) for field duplicates from AS 4482.1 (1997).
3. RPDs for laboratory duplicates specified by the laboratory. Based on the magnitude of the results compared to the level of reporting (LOR), e.g. ALS: result < 10 x LOR = no limit, 10 – 20 x LOR = 0-50%, > 20 x LOR = 0-20%. LabMark: < 5 x LOR = 0-100%, 5 – 10 x LOR = 0-75%, > 10 x LOR = 0-50% or 0-30% for metals.
4. Surrogate recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
5. MS recoveries specified by laboratory based on global acceptance criteria.
6. LCS recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
7. CRM recoveries specified by laboratory based on global acceptance criteria.
8. Trip spike results are specified as either recoveries or RPDs.
9. Passive soil vapour assessments only.

3.0 References

Australian New Zealand Environment and Conservation Council (1996) *Guidelines for the laboratory analysis of contaminated soils*, ANZECC, Canberra, ACT.

Australian Standard AS 4482.1 (2005) *Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and Semi-volatile compounds*, Standards Australia, Homebush, NSW.

CRC for Contamination Assessment and Remediation of the Environment (CARE) (2013) *Petroleum hydrocarbon vapour intrusion assessment: Australian guidance, Technical Report No. 23*. CRC Care, Adelaide, SA.

National Environment Protection Council (NEPC) (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Schedule A and Schedules B(1) – B(9)*, National Environment Protection Council.

NSW Environment Protection Authority (EPA) (2020) *Consultants reporting on contaminated land, Contaminated land guidelines*, (Ref. EPA 2020P2233), State of NSW and the NSW EPA.

United States Environmental Protection Agency (USEPA), Contract Laboratory Program (1994) *National Functional Guidelines for Inorganic Data Review*, USEPA, Washington, DC.

USEPA, Contract Laboratory Program (1999) *National Functional Guidelines for Organic Data Review*, USEPA, Washington, DC.

Data Usability Summary Assessment

A background to data usability is provided in Appendix E. All site work was completed in accordance with standard Easterly Point sampling protocols, including a quality assurance/quality control (QA/QC) programme, standard operating procedures and a set of data quality indicators (DQIs).

A data usability assessment was performed on the soil data collected by Easterly Point, as summarised in the following tables:
- Table 1.1, field QC samples summary;
- Table 1.2, summary of field QA/QC; and
- Table 1.3, summary of laboratory QA/QC.

Table 1.1: Field QC samples summary

	Total samples	Field duplicates [1]	Inter-lab duplicates [1]	Trip spike	Trip blank	Rinsate
Soil						
BTEXN	22	2 (9%)	2 (9%)	0	0	1
TRHs C6 – C10	22	2 (9%)	2 (9%)	0	0	1
TRHs >C10 – C40	22	2 (9%)	2 (9%)	-	-	1
PAHs	13	2 (15%)	2 (15%)	-	-	1
Metals[2]	22	2 (9%)	2 (9%)	-	-	0
OCPs/OPPs	17	2 (12%)	2 (12%)	-	-	1

Notes:
1. Shows number of duplicate samples collected and the percentage of total samples analysed.
2. Arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury.
   – = not applicable, as trip spike/blank analysed for volatile compounds only.

Table 1.2: Summary of field QA/QC

Parameter	Complies	Comments [1]
Precision		
Standard operating procedures (SOPs) appropriate and complied with	Yes	All sampling was conducted under standard Easterly Point operating procedures, and project specific DQIs.
Field duplicates	Partial	≥ 5%. RPD[2] criteria < 30% – 50%. Two field duplicate samples were collected, satisfying the 1/20 primary sample collection criteria. One RPD exceedance was reported of 76% for Zinc.
Inter-laboratory duplicates	Partial	≥ 5%. RPD[2] criteria < 30% – 50%. Two inter-laboratory duplicate samples were collected, satisfying the 1/20 primary sample collection criteria. Two RPD exceedances of 102% and 81%, for Zinc and F3> C16 – C34, respectively, were reported.

Parameter	Complies	Comments [1]
Accuracy		
Matrix spikes samples appropriate	Yes	≥ 1/media type.
Representativeness		
Sample collection - preservation	Yes	All samples were collected directly into laboratory supplied jars with no headspace. All samples were placed immediately into eskies containing ice.
Sample collection - sample splitting	Yes	Duplicate samples were split in the field by filling each container collectively (i.e. co-collected).
Field equipment calibrated	Yes	A PID meter was used and suitably calibrated by the supplier prior to use. The calibration records are provide din Appendix D.
Decontamination procedures	Yes	All re-usable sampling equipment used was decontaminated in between sampling.
Rinsate samples	Yes	Required ≥ 1/field batch, < LORs. One rinsate blank sample was collected with, all results reported below the LORs.
Trip blanks	No	≥ 1/field batch (volatiles), < LORs. No trip blank samples were collected.
Trip spikes	No	≥ 1/field batch (volatiles), 70 - 130%, (recovery) or ≤ 30 - 50% (RPDs). No trip spike samples were collected.
Comparability		
Consistent sampling staff	Yes	All field work was conducted by Hailey Spry of Easterly Point.
Consistent weather/field conditions	Yes	No extreme weather conditions occurred during or immediately before the investigation.
Completeness		
Sample logs and field data	Yes	-
Chain of Custody	Yes	-

Notes:
1. For QC samples, specified frequency and acceptance criteria shown.
2. RPD = relative percentage difference.

Table 1.3: Summary of laboratory QA/QC

Parameter	Complies	Notes [1]
Precision		
Laboratory duplicates	Yes	≥ 10%, laboratory specified. Laboratory duplicate samples were analysed with no RPD exceedances reported.
Accuracy		
Surrogate spikes	Yes	Organics by GC, 70% - 130%. All surrogates were within the laboratory specified global acceptance criteria.
Matrix spikes analysis appropriate	Yes	≥ 70% - 130%. All matrix spike analysis reported recoveries within the acceptance criteria.
Laboratory control samples (LCSs)	Yes	≥ 1/lab batch, 70% - 130%. All LCS reported recoveries within the acceptance criteria.
Representativeness		
Sample condition	Yes	-
Holding times	Yes	-
Laboratory blanks	Yes	≥ 1/lab batch, < LORs. Laboratory blanks samples were analysed, with all results reported below the LORs.
Comparability		
NATA accredited laboratory	Yes	Both primary and secondary laboratories, Eurofins and ALS, are NATA accredited.
NEPM methods or similar	Yes	Eurofins and ALS describe their in-house laboratory methods are referenced from NEPC, ASTM and modified USEPA/APHA documents.
Limits of reporting (LORs) consistent and appropriate	Yes	-
Completeness		
Sample receipt	Yes	-
Laboratory Reports	Yes	-

Notes:

1. For QC samples, acceptance criteria shown. Acceptance criteria can vary based on analyte, statistical data and laboratory specific methods. Laboratory specified relates to detected concentrations based on LORs, e.g. result < 10 x LOR = no limit, 10 – 20 x LOR = 0 - 50%, > 20 x LOR = 0 - 20%. See laboratory reports for specific details.

Summary and discussion

The following issues were identified with the data:

Precision

The data shows minor variability, with one field duplicate RPD exceedance for zinc, and two RPD exceedances for zinc and F3> C16 – C34. The concentrations resulting in these RPDs are relatively low, and all below the health investigation levels/health screening levels, and are likely resulting from small differences arising from sample heterogeneity. As such, these minor exceedances are not considered to affect the precision and outcomes of this investigation.

Laboratory duplicates were analysed at the required frequency and RPD results were within the acceptance criteria.

Accuracy

The accuracy of the analysis is confirmed by matrix spike, surrogate spike and LCS recoveries within the acceptance criteria.

Representativeness

No outliers have been reported for QC samples collected to assist in the qualification of representativeness. Trip spike and trip blank samples were not collected, however all primary samples reported non-detect when analysed for volatiles, therefore this is not deemed significant.

Comparability

The data is considered to be acceptable, with consistent sampling staff, NATA accredited laboratories used and all LORs below the relevant criteria.

Completeness

Laboratory and field documentation is considered to be complete.

Summary

While some minor non-conformances were identified with the data e.g. field duplicate RPD exceedances, no trip spikes or blanks, overall the data is deemed to be of a suitable quality for the purposes of the investigation.

Table 1: Summary of Sampling and Analysis - Quality Control Samples

Sample	Depth (m)	Sample type	Primary Sample	TRHs / BTEXN	TRHs Silical Gel	8 Metals	OCPs / OPPs	PAHs	Asbestos	Hold
Number of analyses										
QC01	BH01_0.0-0.1	Duplicate	BH01_0.0-0.1	x		x	x	x		
QC02	BH01_0.0-0.1	Interlab duplicate	BH01_0.0-0.1	x		x	x	x		
QC03	BH09_0.0-0.1	Duplicate	BH09_0.0 - 0.1	x		x	x	x		
QC04	BH09_0.0-0.1	Interlab duplicate	BH09_0.0 - 0.1	x		x	x	x		
QC05	Water	Rinsate	n/a	x		x	x	x		

Table 2: Soil Analytical Summary, Quality Control (mg/kg)

Analyte	LOR	LOR	LOR	BH01_0.0-0.1	QC01	**RPD**	QC02	**RPD**	BH09_0.0-0.1	QC03	**RPD**	QC04	**RPD**	Rinsate
Type	Primary	Duplicate	-	Primary	Duplicate	%	Interlab Duplicate	%	Primary	Duplicate	%	Interlab Duplicate	%	Lab prep
Media	*Soil*	*Soil*	*Water*	*Soil*	*Soil*	-	*Soil*	-	*Soil*	*Soil*	-	*Soil*	-	*Water*
Metals														
Arsenic	2	5	-	3.1	2.2	34	<5	-	7.3	7.4	1	7	4	-
Cadmium	0.5	1	-	< 0.4	< 0.5	-	<1	-	< 0.5	< 0.5	-	<1	-	-
Chromium	5	2	-	11	7.6	37	4	44	16	16	-	11	37	-
Copper	5	5	-	< 5	7	-	7	-	9.3	9.1	2	8	15	-
Lead	5	5	-	6.2	7.4	18	6	3	11	11	-	9	20	-
Mercury	0.1	2	-	< 0.1	< 0.1	-	<0.1	-	< 0.1	< 0.1	-	<0.1	-	-
Nickel	5	5	-	< 5	< 5	-	<2	-	11	9.9	11	8	32	-
Zinc	5	5	-	54	120	**76**	109	**102**	38	36	5	38	0	-
Pesticides														
Total OCPs	0.1	0.2	0.002	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.002
Total OPPs	2	0.2	0.02	<2	<2	-	<0.2	-	<2	<2	-	<2	-	<0.02
TRHs														
C6 - C10 TRHs	20	10	0.05	< 20	< 20	-	<10	-	< 20	< 20	-	<10	-	<0.05
F1 C6 - C10 TRHs	20	10	0.02	< 20	< 20	-	<10	-	< 20	< 20	-	<10	-	<0.02
F2 >C10 - C16 TRHs	50	50	0.05	< 50	< 50	-	60	-	< 50	< 50	-	<50	-	<0.05
F3 >C16 - C34 TRHs	100	100	0.1	< 100	110	-	200	-	110	< 100	-	260	**81**	<0.1
F4 >C34 - C40 TRHs	100	100	0.1	< 100	120	-	<100	-	< 100	< 100	-	110	-	<0.1
BTEXN														
Benzene	0.1	0.2	0.001	< 0.1	< 0.1	-	< 0.2	-	< 0.1	< 0.1	-	< 0.2	-	< 0.001
Toluene	0.1	0.5	0.001	< 0.1	< 0.1	-	< 0.5	-	< 0.1	< 0.1	-	< 0.5	-	< 0.001
Ethylbenzene	0.1	0.5	0.001	< 0.1	< 0.1	-	< 0.5	-	< 0.1	< 0.1	-	< 0.5	-	< 0.001
Xylenes	0.3	0.5	0.003	< 0.3	< 0.3	-	< 0.5	-	< 0.3	< 0.3	-	< 0.5	-	< 0.003
Naphthalene	0.5	1	0.001	<0.5	<0.5	-	<1	-	<0.5	<0.5	-	<1	-	< 0.001
Data Quality Indicator														
Data Quality Indicator	-		-	-	-	*<50%*	-	*<50%*	-	-	*<50%*	-	*<50%*	*nd*

See tables notes at end of section

Appendix F

Geological borelogs

Borehole log BH01

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/2022
TOTAL DEPTH 0.45
DIAMETER 100 mm
CASING -
SCREEN -

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Wet boggy, swampy ground. Sample collected near IBC tank next to Shed 2.

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
	0.0 - 0.1			0.1		V	Clayey, Silty SAND, Black, soft, low plasticity, no odours or staining		45.1 45
	0.2 - 0.3			0.2		S	SAND, white - grey, loose, saturated, no odours or staining		44.9
				0.3 0.4			Pockets of black clay.		44.8 44.7
				0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9					44.6 44.5 44.4 44.3 44.2 44.1 44 43.9 43.8 43.7 43.6 43.5 43.4 43.3 43.2
				2			EOH at 0.45 in SAND		43.1

Disclaimer This bore log is intended for environmental not geotechnical purposes.

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Borehole log BH02

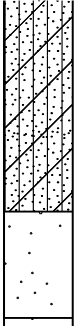
PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/2022
TOTAL DEPTH 2
DIAMETER 100 mm
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Targeted to wooden work-bench in area of Shed 2.

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
	0.0 - 0.1			0.1			Clayey, silty SAND, black, soft, very moist, low plasticity, no odours or staining pockets of white/yellow clayey sand		45.1
				0.2					45
	0.3 - 0.4			0.3		∇	Clayey SAND, white/grey, loose, saturated		44.9
				0.4					44.8
				0.5					44.7
				0.6					44.6
				0.7					44.5
				0.8					44.4
				0.9					44.3
				1					44.2
				1.1					44.1
				1.2					44
				1.3					43.9
				1.4					43.8
				1.5					43.7
				1.6					43.6
				1.7					43.5
				1.8					43.4
				1.9					43.3
				2					43.2
							End of hole at 0.45 m in saturated sand		43.1

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Easterly Point

Borehole log BH03

PROJECT NUMBER	**DRILLING DATE** 12/07/22	**COORDINATES**
PROJECT NAME	**TOTAL DEPTH** 0.3	**COORD SYS**
CLIENT	**DIAMETER** 100 mm	**COMPLETION**
ADDRESS	**CASING**	**SURFACE ELEVATION**
LICENCE NO.	**SCREEN**	**WELL TOC**

COMMENTS Shed 2, targeted to area of grass disturbance (possibly used as driveway) and for spatial coverage of area

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
	0.0 - 0.1			0.1	▨		Silty CLAY, black, soft, moist, no odours or staining		45.1 45
	0.15 - 0.2			0.2 0.3	▨		CLAY, yellow with pockets of black sand and iron-stained clay		44.9
				0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2					44.8 44.7 44.6 44.5 44.4 44.3 44.2 44.1 44 43.9 43.8 43.7 43.6 43.5 43.4 43.3 43.2
							End of hole at 0.3 m in clay.		43.1

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Borehole log BH04

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/22
TOTAL DEPTH
DIAMETER 100 mm
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Targeted to area of former driveway along southern boundary of 110 Carrs Drive. Located on embankment in area of possibly fill (roadbase)

LOGGED BY
CHECKED BY

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
					▨		FILL. Clayey, sandy SILT with large gravels, black, soft. Possibly re-worked natural?		45.1
	0.1 - 0.2			0.1					
					▨		FILL. Clayey sand with gravels (road base), dark grey Increasing gravels and small black gravels with large chunks of asphalt. Possibly fill with re-worked natural?		45
				0.2					
									44.9
	0.3 - 0.45 (jar and bag)			0.3	⁘		Gravelly SAND, loose, dry		
									44.8
				0.4					
									44.7
				0.5					
									44.6
				0.6					
									44.5
				0.7					
									44.4
				0.8					
									44.3
				0.9					
									44.2
				1					
									44.1
				1.1					
									44
				1.2					
									43.9
				1.3					
									43.8
				1.4					
									43.7
				1.5					
									43.6
				1.6					
									43.5
				1.7					
									43.4
				1.8					
									43.3
				1.9					
									43.2
				2			End of hole at 0.5 m		43.1

Borehole log BH05

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/22
TOTAL DEPTH
DIAMETER 100 mm
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Northern area of 110 Carrs Drive near abandoned structures. Targeted to blue plastic "Approved DG container".

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
0 ppm	0.0 - 0.1			0.1 0.2	▨		Silty, sandy CLAY, black, soft, no odours or staining		45.1 45
				0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2					44.9 44.8 44.7 44.6 44.5 44.4 44.3 44.2 44.1 44 43.9 43.8 43.7 43.6 43.5 43.4 43.3 43.2
							End of hole at 0.2 m in natural.		43.1

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Borehole log BH06

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/22
TOTAL DEPTH
DIAMETER 100 mm
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Northern area near abandoned structures. Targeted to shed made of timber posts and tin roof. Rubbish scattered around

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
	0.0 - 0.1			0.1 0.2	▨		Silty CLAY, with minor sand, black, soft, very moist, medium plasticity		45.1 45
				0.3	▨		CLAY, yellow/grey, medium stiff, moist, medium plasticity		44.9
	0.3 - 0.4			0.4	⁘	∇	SAND, white, loose, saturated		44.8
				0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9					44.7 44.6 44.5 44.4 44.3 44.2 44.1 44 43.9 43.8 43.7 43.6 43.5 43.4 43.3 43.2
				2			End of hole in natural, saturated sand		43.1

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Easterly Point

Borehole log BH07

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/22
TOTAL DEPTH
DIAMETER 100 mm
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Northern area, target edge of concrete slab.

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
	0.0 - 0.1			0.1	▨		Sandy, Silty CLAY, black, soft, moist		45.1
	0.15 - 0.25			0.2 0.3	▨		∇ Clayey Gravel, water ingress, chunks of burnt timber throughout		45 44.9
	0.3 - 0.35			0.4 0.5	⁘		Clayey SAND, light grey, loose, saturated		44.8 44.7
				0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9					44.6 44.5 44.4 44.3 44.2 44.1 44 43.9 43.8 43.7 43.6 43.5 43.4 43.3 43.2
				2			End of hole in natural, saturated sand		43.1

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Easterly Point

Borehole log BH08

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/22
TOTAL DEPTH
DIAMETER 100 mm HA
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Targeted to former HA03 and oil drum

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
0 ppm	0.0 - 0.1				▨		Oil stained dead grass - no odours. Silty CLAY, black, moist, no odours, black staining but no oily sheen		
					▨				45.1
				0.1	▨				
0 ppm	0.15 - 0.2				▨		Silty CLAY with trace sand, moist, medium plasticity, no odours or staining		45
				0.2	▨				
					▨				44.9
				0.3	▨				
					▨				44.8
				0.4		∇			
0 ppm	0.4 - 0.5				⁚		SAND, light brown/grey, saturated, no odours or staining		44.7
				0.5					
									44.6
				0.6					
									44.5
				0.7					
									44.4
				0.8					
									44.3
				0.9					
									44.2
				1					
									44.1
				1.1					
									44
				1.2					
									43.9
				1.3					
									43.8
				1.4					
									43.7
				1.5					
									43.6
				1.6					
									43.5
				1.7					
									43.4
				1.8					
									43.3
				1.9					
									43.2
				2			End of hole in saturated, natural sand		
									43.1

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Easterly Point

Borehole log BH09

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/22
TOTAL DEPTH
DIAMETER 100 mm HA
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS within Shed 1

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
0 ppm	0 - 0.1, QC03, QC04			0 - 0.2	▨		Silty, sandy CLAY, black, soft, medium dense, slightly moist, no odours or staining, rusty metal nail, roots		
0 ppm	0.2 - 0.25			0.2 - 0.3	▨		▽ Silty CLAY, soft, very moist - saturated, medium plasticity, no odours or staining		
							End of hole at 0.3 m in natural		

Depth (m): 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2

Elevation (m): 45.1, 45, 44.9, 44.8, 44.7, 44.6, 44.5, 44.4, 44.3, 44.2, 44.1, 44, 43.9, 43.8, 43.7, 43.6, 43.5, 43.4, 43.3, 43.2, 43.1

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Easterly Point

Borehole log SS01

PROJECT NUMBER 21029	**DRILLING DATE** 12/07/22	**COORDINATES**
PROJECT NAME CYL, Yamba	**TOTAL DEPTH**	**COORD SYS**
CLIENT Clifton Yamba Land	**DIAMETER** -	**COMPLETION**
ADDRESS 110 - 120 Carrs Drive, Yamba	**CASING**	**SURFACE ELEVATION**
LICENCE NO.	**SCREEN**	**WELL TOC**

COMMENTS Surface sample within Shed 1

LOGGED BY HS
CHECKED BY HS

PID	Samples	Analysed	% Recovery	Depth (m)	Graphic Log	Moisture	Material Description	Well Diagram	Elevation (m)
	0.0 - 0.1			0.1	▨		Silty, sandy CLAY, black, soft, slightly moist, no odours or staining		45.1
				0.2					45
				0.3					44.9
				0.4					44.8
				0.5					44.7
				0.6					44.6
				0.7					44.5
				0.8					44.4
				0.9					44.3
				1					44.2
				1.1					44.1
				1.2					44
				1.3					43.9
				1.4					43.8
				1.5					43.7
				1.6					43.6
				1.7					43.5
				1.8					43.4
				1.9					43.3
									43.2

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Easterly Point

Borehole log SED01

PROJECT NUMBER 21029
PROJECT NAME CYL, Yamba
CLIENT Clifton Yamba Land
ADDRESS 110 - 120 Carrs Drive, Yamba
LICENCE NO.

DRILLING DATE 12/07/22
TOTAL DEPTH
DIAMETER -
CASING
SCREEN

COORDINATES
COORD SYS
COMPLETION
SURFACE ELEVATION
WELL TOC

COMMENTS Sediment sample within stream

LOGGED BY
CHECKED BY

PID	**Samples**	**Analysed**	**% Recovery**	**Depth (m)**	**Graphic Log**	**Moisture**	**Material Description**	**Well Diagram**	**Elevation (m)**
	SED01				┆┆┆┆		silt, grey, soft, anoxic/sulfidic odour		45.1
				0.1					
									45
				0.2					
									44.9
				0.3					
									44.8
				0.4					
									44.7
				0.5					
									44.6
				0.6					
									44.5
				0.7					
									44.4
				0.8					
									44.3
				0.9					
									44.2
				1					
									44.1
				1.1					
									44
				1.2					
									43.9
				1.3					
									43.8
				1.4					
									43.7
				1.5					
									43.6
				1.6					
									43.5
				1.7					
									43.4
				1.8					
									43.3
				1.9					
									43.2

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Table A. Soil profile description and sample analysis logs

Client: Easterly Point Environmental
Site Address: 120 Carrs Drive, Yamba, New South Wales
Commenced 12 July 2022
Completed: 12 July 2022
Project: Acid Sulfate Soil Investigation and Management Plan
RPD: Lot 2 DP733507 and Lot 32 DP1280863
Logged by: Chris Butler
Project Number: PE3394.22
Equipment Type: Track mounted rig - solid stem augers
Checked by: Sean Gardiner

											Key Results		
BOREHOLE **ASS-**	**FILL/NATURAL**	**DEPTH (m)**	**MATERIAL CLASSIFICATION**	**MATERIAL CONSTITUENTS**	**COLOUR**	**OTHER MATERIALS**	**SEEPAGE**	**ODOUR**	**FIELD SCREEN SAMPLE DEPTH**	**CHROMIUM SUITE SAMPLE DEPTH**	**Titratable actual acidity results (mol H^+/t)**	**S_{cr} (potential acidity)**	**Net acidity including ANC (mol H^+/t)**
BH1	Natural	0.0	Sandy Light Clay	Fine to medium grained sand, moist	Brown	Organics	Nil	Nil	0.0 - 0.25	0.0 - 0.25	31	12	43
		0.25	Sandy Light to Medium Clay	Fine to medium grainded sand, moist	Brown	Trace organics	Nil	Nil	0.25 - 0.5	-	-	-	-
		0.5	Sand	Fine to medium grained, wet	Yellow brown	Trace silt	Yes	Nil	0.5 - 0.75	0.5 - 0.75	4	<10	13
									0.75 - 1.0	-	-	-	-
									1.0 - 1.25	1.0 - 1.25	4	<10	13
		1.25	Sand	Fine to medium grained, wet	Grey	Trace silt	Nil	Nil	1.25 - 1.5	-	-	-	-
									1.5 - 1.75	1.5 - 1.75	6	123	129
									1.75 - 2.0	-	-	-	-
									2.0 - 2.25	-	-	-	-
									2.25 - 2.5	-	-	-	-
									2.5 - 2.75	2.5 - 2.75	4	121	125
									2.75 - 3.0	-	-	-	-
		3.0	Borehole terminated										
BH2	Natural	0.0	Silty Medium Clay	Moist	Dark grey	Trace fine grained sand	Nil	Nil	0.0 - 0.25	0.0 - 0.25	66	<10	74
		0.25	Sandy Light to Medium Clay	Fine to medium grained sand, moist	Grey yellow orange	-	Nil	Nil	0.25 - 0.4	-	-	-	-
		0.40	Clayey Sand	Fine to medium grained sand, moist	Grey yellow orange	-	Nil	Nil	-	-	-	-	-
		0.50	Sand	Fine to medium grained, wet	Grey	-	Yes	Nil	0.5 - 0.75	-	-	-	-
		1.25	Sand	Fine to medium grained, wet	Grey	Trace silt	Nil	Nil	1.25 - 1.5	-	-	-	-
		2.0	Borehole terminated										
BH3	Natural	0.0	Silty Medium Clay	Moist	Dark grey	Trace fine grained sand	Nil	Nil	0.0 - 0.25	0.0 - 0.25	128	10	138
		0.25	Sandy Medium Clay	Fine to medium grained sand, abundant organics, moist	Grey orange brown mottled	-	Nil	Nil	0.25 - 0.5	-	-	-	-
		0.50	Sand	Fine grained, wet	Yellow brown	-	Yes	Nil	0.5 - 0.75	-	-	-	-
									0.75 - 1.0	-	-	-	-
									1.0 - 1.2	-	-	-	-
		1.20	Sand	Fine grained, wet	Grey	-	Nil	Nil	1.25 - 1.5	-	-	-	-
									1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										
BH4	Natural	0.0	Sandy Medium Clay	Fine to coarse grained sand, moist to very moist	Brown	-	Nil	Nil	0.0 - 0.25	0.0 - 0.25	17	24	41
									0.25 - 0.5	-	-	-	-
		0.5	Sandy Heavy Clay	Fine to medium grained sand, moist	Brown with orange mottles	-	Nil	Nil	0.5 - 0.75	0.5 - 0.75	9	17	26
									0.75 - 0.9	-	-	-	-
		0.9	Silty Sand	Fine to coarse grained sand, wet	Grey	-	Yes	Nil	1.0 - 1.25	1.0 - 1.25	2	139	142
									1.25 - 1.5	-	-	-	-
									1.5 - 1.75	1.5 - 1.75	3	116	120
									1.75 - 2.0	-	-	-	-
									2.0 - 2.25	-	-	-	-
									2.25 - 2.5	2.25 - 2.5	<2	94	94
		3.0	Borehole terminated										
BH5	Natural	0.0	Clayey Sand	Fine to coarse grained sand, very moist	Dark grey	-	Nil	Nil	0.0 - 0.25	-	-	-	-
		0.4	Sand	Fine to medium grained, very moist	Brown grey with orange mottles	-	Nil	Nil	0.5 - 0.75	-	-	-	-
									0.75 - 0.9	-	-	-	-
		0.9	Sand	Fine to medium grained, wet	Brown grey with orange	-	Yes	Nil	1.0 - 1.1	-	-	-	-
		1.1	Sand	Fine to medium grained, wet	Grey	-	Nil	Nil	1.25 - 1.5	-	-	-	-
									1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
									2.0 - 2.25	-	-	-	-
		3.0	Borehole terminated										
BH6	Fill	0.0	Clayey Sand	Fine to medium grained sand, moist	Orange grey brown	-	Nil	Nil	0.0 - 0.2	0.0 - 0.2	12	14	26
		0.2	Sandy Light Clay	Fine to medium grained sand, moist	Grey black	-	Nil	Nil	0.25 - 0.5	-	-	-	-
									0.5 - 0.75	0.5 - 0.75	45	16	61
									0.75 - 0.8	-	-	-	-
	Natural	0.8	Clayey Sand	Fine to coarse grained sand, wet	Brown grey	-	Yes	Nil	-	-	-	-	-
		1.0	Sand	Fine to coarse grained, wet	Brown grey with orange mottles	-	Nil	Nil	1.0 - 1.25	1.0 - 1.25	15	12	27
									1.25 - 1.5	-	-	-	-
		1.5	Sand	Fine to coarse grained, wet	Grey	-	Nil	Nil	1.5 - 1.75	1.5 - 1.75	10	88	97
									1.75 - 2.0	-	-	-	-
									2.0 - 2.25	-	-	-	-
									2.25 - 2.5	-	-	-	-
									2.5 - 2.75	2.5 - 2.75	8	100	107
									2.75 - 3.0	-	-	-	-
		3.0	Borehole terminated										
BH7	Natural	0.0	Sandy silty medium clay	Fine to medium grained sand, moist	Dark brown	-	Nil	Nil	0.0 - 0.25	0.0 - 0.25	106	11	117
		0.25	Clayey Sand	Fine to coarse grained sand, very moist	Yellow brown	-	Nil	Nil	0.25 - 0.4	-	-	-	-
		0.4	Sand	Fine to coarse grained, wet	Grey yellow brown	-	Yes	Nil	0.5 - 0.75	-	-	-	-
									0.75 - 1.0	-	-	-	-
									1.0 - 1.25	-	-	-	-
		1.25	Sand	Fine to coarse grained, wet	Grey	-	Nil	Nil	1.25 - 1.5	-	-	-	-
									1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										
BH8	Fill	0.0	Sandy Light Clay	Fine to medium grained sand, moist	Dark grey with brown mottles	-	Nil	Nil	0.0 - 0.25	0.0 - 0.25	40	<10	49
		0.25	Silty Sandy Heavy Clay	Fine to medium grained sand, moist	Grey with orange mottles	-	Nil	Nil	0.25 - 0.5	0.25 - 0.5	44	11	55
	Natural	0.5	Sand	Fine to medium grained, wet	Grey	-	Yes	Nil	0.5 - 0.75	0.5 - 0.75	<2	12	12
									0.75 - 1.0	-	-	-	-
									1.0 - 1.25	-	-	-	-
									1.25 - 1.5	-	-	-	-
									1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										

Table A. Soil profile description and sample analysis logs

Client:	Easterly Point Environmental	**Site Address:**	110 - 120 Carrs Drive, Yamba, New South Wales	**Commenced**	12 July 2022		
				Completed:	12 July 2022		
Project:	Acid Sulfate Soil Investigation and Management Plan	**RPD:**	Lot 2 DP733507 and Lot 32 DP1280863	**Logged by:**	Chris Butler	**Key Results**	
Project Number:	PE3394.22	**Equipment Type:**	Track mounted rig - solid stem augers	**Checked by:**	Sean Gardiner		

BOREHOLE **ASS-**	**FILL/NATURAL**	**DEPTH (m)**	**MATERIAL CLASSIFICATION**	**MATERIAL CONSTITUENTS**	**COLOUR**	**OTHER MATERIALS**	**SEEPAGE**	**ODOUR**	**FIELD SCREEN SAMPLE DEPTH**	**CHROMIUM SUITE SAMPLE DEPTH**	**Titratable actual acidity results (mol H^+/t)**	**S_{Cr} (potential acidity)**	**Net acidity including ANC (mol H^+/t)**
BH9	Natural	0.0	Sandy Light Clay	Fine to medium grained, sand, moist	Dark grey	Trace tree roots and	Nil	Nil	0.0 - 0.25	0.0 - 0.25	79	18	98
		0.25	Sandy Medium Clay	Fine to medium grained sand, moist to very moist	Grey with orange mottles	-	Nil	Nil	0.25 - 0.5	-	-	-	-
									0.5 - 0.7	0.5 - 0.7	<2	<10	<10
		0.7	Sand	Fine to medium grained, wet	Brown	-	Yes	Nil	0.75 - 1.0	-	-	-	-
		1.0	Sand	Fine to medium grained, wet	Grey	Trace of silt	Nil	Nil	1.0 - 1.25	1.0 - 1.25	3	23	26
									1.25 - 1.5	-	-	-	-
									1.5 - 1.75	1.5 - 1.75	7	77	84
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										
BH10	Natural	0.0	Sandy Light to Medium Clay	Fine to medium grained sand, moist	Dark grey	Trace tree roots	Nil	Nil	0.0 - 0.25	0.0 - 0.25	42	14	56
		0.25	Clayey Sand	Fine to medium grained sand, wet	Grey brown	-	Yes	Nil	0.25 - 0.4	-	-	-	-
		0.4	Sand	Fine to medium grained, wet	Yellow brown	-	Nil	Nil	0.5 - 0.75	-	-	-	-
									0.75 - 1.0	-	-	-	-
		0.9	Sand	Fine to medium grained, wet	Grey	-	Nil	Nil	1.0 - 1.25	-	-	-	-
									1.25 - 1.5	-	-	-	-
									1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										
BH11	Fill	0.0	Sand	Fine to medium grained, moist	Grey	-	Nil	Nil	0.0 - 0.25	0.0 - 0.25	4	12	16
		0.25	Sandy Light Clay	Fine to medium grained sand, moist	Grey with dark grey mottles	-	Nil	Nil	0.25 - 0.5	-	-	-	-
									0.5 - 0.75	0.5 - 0.75	32	<10	39
	Natural	0.75	Sandy Light Clay	Fine to medium grained sand, moist	Dark grey	Trace organics	Nil	Nil	0.75 - 0.95	0.75 - 0.95	49	<10	57
		0.95	Sand	Fine to medium grained, moist	Grey	-	Nil	Nil	1.0 - 1.2	1.0 - 1.2	8	<10	16
		1.2	Sand	Fine to medium grained, moist	Light grey	-	Nil	Nil	1.25 - 1.5	-	-	-	-
		1.5	Sand	Fine to medium grained, wet	Light grey	-	Yes	Nil	1.5 - 1.75	1.5 - 1.75	5	132	138
									1.75 - 2.0	-	-	-	-
									2.0 - 2.25	-	-	-	-
									2.25 - 2.5	-	-	-	-
									2.5 - 2.75	2.5 - 2.75	4	118	122
									2.75 - 3.0	-	-	-	-
		3.0	Borehole terminated										
BH12	Natural	0.0	Silty Medium Clay	-	Brown	Moderate organics	Nil	Nil	0.0 - 0.25	0.0 - 0.25	66	<10	74
		0.25	Sand	Fine to coarse grained, wet	Brown	-	Yes	Nil	0.25 - 0.5	-	-	-	-
									0.5 - 0.75	-	-	-	-
									0.75 - 1.0	-	-	-	-
		1.0	Sand	Fine to coarse grained, wet	Grey	-	Nil	Nil	1.0 - 1.25	-	-	-	-
									1.25 - 1.5	-	-	-	-
									1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										
BH13	Natural	0.0	Sandy Light Clay	Fine to medium grained sand, very moist	Dark brown	-	Nil	Nil	0.0 - 0.25	0.0 - 0.25	87	<10	96
		0.25	Sandy Light Clay	Fine to medium grained sand, very moist	Grey with orange mottles	-	Nil	Nil	0.25 - 0.5	-	-	-	-
		0.5	Sand	Fine to coarse grained, wet	Brown grey	-	Yes	Nil	0.5 - 0.75	-	-	-	-
									0.75 - 1.0	-	-	-	-
									1.0 - 1.25	-	-	-	-
									1.25 - 1.5	-	-	-	-
									1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										
BH14	Natural	0.0	Sandy Light Clay	Fine to medium grained sand, very moist	Dark brown	-	Nil	Nil	0.0 - 0.2	0.0 - 0.2	124	15	138
		0.2	Sandy Light Clay	Fine to medium grained sand, very moist	Grey with orange mottles	-	Nil	Nil	0.25 - 0.5	-	-	-	-
		0.5	Sand	Fine to coarse grained, wet	Grey orange	-	Yes	Nil	0.5 - 0.75	0.5 - 0.75	4	<10	13
									0.75 - 1.0	-	-	-	-
		1.0	Sand	Fine to coarse grained, wet	Grey	-	Nil	Nil	1.0 - 1.25	1.0 - 1.25	7	67	74
									1.25 - 1.5	-	-	-	-
									1.5 - 1.75	1.5 - 1.75	11	69	69
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										
BH15	Natural	0.0	Sandy Light Clay	Fine to medium grained sand, very moist	Dark brown	-	Nil	Nil	0.0 - 0.25	0.0 - 0.25	108	13	121
		0.25	Sandy Light Clay	Fine to medium grained sand, very moist	Grey with orange mottles	-	Nil	Nil	0.25 - 0.5	-	-	-	-
		0.5	Sand	Fine to coarse grained, wet	Grey brown	-	Yes	Nil	0.5 - 0.75	0.5 - 0.75	4	<10	14
									0.75 - 1.0	-	-	-	-
									1.0 - 1.25	1.0 - 1.25	4	67	71
									1.25 - 1.5	-	-	-	-
		1.5	Sand	Fine to coarse grained, wet	Grey	-	Nil	Nil	1.5 - 1.75	-	-	-	-
									1.75 - 2.0	-	-	-	-
		2.0	Borehole terminated										

Appendix G

Laboratory reports

NATA Accredited
Accreditation Number 1261
Site Number 20794

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

Easterly Point Environmental Pty Ltd
1/64 Kingsley Street
Byron Bay
NSW 2481

Attention: **Hailey**

Report **905836-S**
Project name YAMBA
Project ID 21029
Received Date Jul 14, 2022

Client Sample ID			**BH01_0.0-0.1**	**BH01_0.2-0.3**	**BH02_0.0-0.1**	**BH03_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028835**	**B22-Jl0028836**	**B22-Jl0028837**	**B22-Jl0028839**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	110	-
TRH C29-C36	50	mg/kg	< 50	-	200	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	310	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	59	59	88	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			**BH01_0.0-0.1**	**BH01_0.2-0.3**	**BH02_0.0-0.1**	**BH03_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028835**	**B22-Jl0028836**	**B22-Jl0028837**	**B22-Jl0028839**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	72	-	-	-
p-Terphenyl-d14 (surr.)	1	%	62	-	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
d-HCH	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	52	-	-	65
Tetrachloro-m-xylene (surr.)	1	%	78	-	-	88
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2

Client Sample ID			**BH01_0.0-0.1**	**BH01_0.2-0.3**	**BH02_0.0-0.1**	**BH03_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028835**	**B22-Jl0028836**	**B22-Jl0028837**	**B22-Jl0028839**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	60	-	-	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	260	-
TRH >C34-C40	100	mg/kg	< 100	-	140	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	400	-
TRH - 2013 NEPM Fractions (after silica gel clean-up)						
TRH >C10-C16 (after silica gel clean-up)	50	mg/kg	< 50	< 50	-	< 50
TRH >C16-C34 (after silica gel clean-up)	100	mg/kg	< 100	< 100	-	< 100
TRH >C34-C40 (after silica gel clean-up)	100	mg/kg	< 100	< 100	-	< 100
TRH >C10-C40 (total) (after silica-gel clean up)*	100	mg/kg	< 100	< 100	-	< 100
TRH - 1999 NEPM Fractions (after silica gel clean-up)						
TRH C10-C14 (after silica gel clean-up)	20	mg/kg	< 20	< 20	-	< 20
TRH C15-C28 (after silica gel clean-up)	50	mg/kg	< 50	< 50	-	< 50
TRH C29-C36 (after silica gel clean-up)	50	mg/kg	< 50	< 50	-	< 50
TRH C10-C36 (Total) (after silica gel clean-up)	100	mg/kg	< 50	< 50	-	< 50
Heavy Metals						
Arsenic	2	mg/kg	3.1	-	2.3	5.1
Cadmium	0.4	mg/kg	< 0.4	-	< 0.5	< 0.4
Chromium	5	mg/kg	11	-	8.2	11
Copper	5	mg/kg	< 5	-	5.4	6.2
Lead	5	mg/kg	6.2	-	< 5	8.6
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	-	< 5	5.8
Zinc	5	mg/kg	54	-	11	17
% Moisture	1	%	23	23	32	30
Naphthalene^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5

Client Sample ID			G01BH04_0.1-0.2	BH04_0.3-0.35	BH05_0.0-0.1	BH06_0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028841**	**B22-Jl0028842**	**B22-Jl0028843**	**B22-Jl0028844**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	-	24
TRH C15-C28	50	mg/kg	< 50	66	-	150
TRH C29-C36	50	mg/kg	51	120	-	120
TRH C10-C36 (Total)	50	mg/kg	51	186	-	294
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	133	124	121	122
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene N02	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2) N01	50	mg/kg	< 50	< 50	-	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	-	< 20
TRH C6-C10 less BTEX (F1) N04	20	mg/kg	< 20	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.2	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	2.4	1.2	-	1.2
Acenaphthene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene N07	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	< 1	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	< 1	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	75	90	-	97
p-Terphenyl-d14 (surr.)	1	%	74	85	-	99
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.2	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05

Client Sample ID			G01 BH04_0.1-0.2	BH04_0.3-0.35	BH05_0.0-0.1	BH06_0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028841**	**B22-Jl0028842**	**B22-Jl0028843**	**B22-Jl0028844**
Date Sampled			Jul 12, 2022	Jul 12, 2022	Jul 12, 2022	Jul 12, 2022
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
b-HCH	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.1	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	72	107	-	111
Tetrachloro-m-xylene (surr.)	1	%	88	100	-	107
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	-	< 2
Demeton-S	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	< 1	< 0.2	-	< 0.2
EPN	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Methyl parathion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	-	< 2
Naled	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Omethoate	2	mg/kg	< 2	< 2	-	< 2
Phorate	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 1	< 0.2	-	< 0.2

Client Sample ID			[G01]BH04_0.1-0.2	BH04_0.3-0.35	BH05_0.0-0.1	BH06_0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028841**	**B22-Jl0028842**	**B22-Jl0028843**	**B22-Jl0028844**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Pyrazophos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	< 1	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	60	90	-	104
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	140	-	220
TRH >C34-C40	100	mg/kg	< 100	180	-	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	320	-	340
TRH - 2013 NEPM Fractions (after silica gel clean-up)						
TRH >C10-C16 (after silica gel clean-up)	50	mg/kg	-	-	< 50	-
TRH >C16-C34 (after silica gel clean-up)	100	mg/kg	-	-	< 100	-
TRH >C34-C40 (after silica gel clean-up)	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total) (after silica-gel clean up)*	100	mg/kg	-	-	< 100	-
TRH - 1999 NEPM Fractions (after silica gel clean-up)						
TRH C10-C14 (after silica gel clean-up)	20	mg/kg	-	-	< 20	-
TRH C15-C28 (after silica gel clean-up)	50	mg/kg	-	-	< 50	-
TRH C29-C36 (after silica gel clean-up)	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total) (after silica gel clean-up)	100	mg/kg	-	-	< 50	-
Heavy Metals						
Arsenic	2	mg/kg	2.4	2.9	-	15
Cadmium	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chromium	5	mg/kg	8.3	9.6	-	27
Copper	5	mg/kg	< 5	< 5	-	17
Lead	5	mg/kg	8.7	10	-	75
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Nickel	5	mg/kg	< 5	< 5	-	6.7
Zinc	5	mg/kg	20	18	-	290
% Moisture	1	%	13	14	43	51
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			BH06_0.3-0.4	BH07_0.0-0.1	BH07_0.15-0.25	BH07_0.3-0.35
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028845**	**B22-Jl0028846**	**B22-Jl0028847**	**B22-Jl0028848**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	24	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	97	< 50	53
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	121	< 50	53

Client Sample ID			**BH06_0.3-0.4**	**BH07_0.0-0.1**	**BH07_0.15-0.25**	**BH07_0.3-0.35**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028845**	**B22-Jl0028846**	**B22-Jl0028847**	**B22-Jl0028848**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	122	139	89	125
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	87	97	89
p-Terphenyl-d14 (surr.)	1	%	95	97	103	98
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			**BH06_0.3-0.4**	**BH07_0.0-0.1**	**BH07_0.15-0.25**	**BH07_0.3-0.35**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028845**	**B22-Jl0028846**	**B22-Jl0028847**	**B22-Jl0028848**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	85	68	82	68
Tetrachloro-m-xylene (surr.)	1	%	93	98	105	95
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	73	52	66	63

Client Sample ID			BH06_0.3-0.4	BH07_0.0-0.1	BH07_0.15-0.25	BH07_0.3-0.35
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028845**	**B22-Jl0028846**	**B22-Jl0028847**	**B22-Jl0028848**
Date Sampled			Jul 12, 2022	Jul 12, 2022	Jul 12, 2022	Jul 12, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	110	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	110	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	< 2	5.9	6.3	< 2
Cadmium	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	5	mg/kg	< 5	27	20	6.2
Copper	5	mg/kg	< 5	38	17	< 5
Lead	5	mg/kg	< 5	900	150	5.4
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	13	7.4	< 5
Zinc	5	mg/kg	9.2	420	190	12
% Moisture	1	%	17	29	37	23

Client Sample ID			BH08_0.0-0.1	BH08_0.15-0.2	BH08_0.4-0.45	BH09_0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028849**	**B22-Jl0028850**	**B22-Jl0028851**	**B22-Jl0028852**
Date Sampled			Jul 12, 2022	Jul 12, 2022	Jul 12, 2022	Jul 12, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	27000	2100	170	57
TRH C29-C36	50	mg/kg	22000	1700	170	75
TRH C10-C36 (Total)	50	mg/kg	49000	3800	340	132
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	58	109	117
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	140	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			**BH08_0.0-0.1**	**BH08_0.15-0.2**	**BH08_0.4-0.45**	**BH09_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028849**	**B22-Jl0028850**	**B22-Jl0028851**	**B22-Jl0028852**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	76	59	88	92
p-Terphenyl-d14 (surr.)	1	%	96	73	77	90
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	57	83	115	90
Tetrachloro-m-xylene (surr.)	1	%	86	105	90	93
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH08_0.0-0.1** **Soil** **B22-Jl0028849** **Jul 12, 2022**	**BH08_0.15-0.2** **Soil** **B22-Jl0028850** **Jul 12, 2022**	**BH08_0.4-0.45** **Soil** **B22-Jl0028851** **Jul 12, 2022**	**BH09_0.0-0.1** **Soil** **B22-Jl0028852** **Jul 12, 2022**
Organophosphorus Pesticides						
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	114	144	94	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	140	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	46000	3700	310	110
TRH >C34-C40	100	mg/kg	4100	310	130	< 100
TRH >C10-C40 (total)*	100	mg/kg	50240	4010	440	110
TRH - 2013 NEPM Fractions (after silica gel clean-up)						
TRH >C10-C16 (after silica gel clean-up)	50	mg/kg	97	< 50	-	-
TRH >C16-C34 (after silica gel clean-up)	100	mg/kg	43000	3200	-	-
TRH >C34-C40 (after silica gel clean-up)	100	mg/kg	4100	300	-	-
TRH >C10-C40 (total) (after silica-gel clean up)*	100	mg/kg	47000	3500	-	-
TRH - 1999 NEPM Fractions (after silica gel clean-up)						
TRH C10-C14 (after silica gel clean-up)	20	mg/kg	< 20	< 20	-	-
TRH C15-C28 (after silica gel clean-up)	50	mg/kg	24000	1800	-	-
TRH C29-C36 (after silica gel clean-up)	50	mg/kg	21000	1500	-	-
TRH C10-C36 (Total) (after silica gel clean-up)	100	mg/kg	45000	3300	-	-

Client Sample ID			**BH08_0.0-0.1**	**BH08_0.15-0.2**	**BH08_0.4-0.45**	**BH09_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028849**	**B22-Jl0028850**	**B22-Jl0028851**	**B22-Jl0028852**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	8.7	11	< 2	7.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.5	< 0.5
Chromium	5	mg/kg	24	27	< 5	16
Copper	5	mg/kg	15	7.7	< 5	9.3
Lead	5	mg/kg	27	12	< 5	11
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	13	10	< 5	11
Zinc	5	mg/kg	140	55	9.8	38
% Moisture	1	%	40	29	26	31

Client Sample ID			**SED01**	**SS01**	**ASSBH04_0.1-0.2**	**ASSBH06_0.6-0.8**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028854**	**B22-Jl0028855**	**B22-Jl0028856**	**B22-Jl0028857**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	44	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	450	63	< 50
TRH C29-C36	50	mg/kg	54	1100	110	58
TRH C10-C36 (Total)	50	mg/kg	54	1594	173	58
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	56	86	122	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	62	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			SED01	SS01	ASSBH04_0.1-0.2	ASSBH06_0.6-0.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B22-Jl0028854	B22-Jl0028855	B22-Jl0028856	B22-Jl0028857
Date Sampled			Jul 12, 2022	Jul 12, 2022	Jul 12, 2022	Jul 12, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	72	-	-	-
p-Terphenyl-d14 (surr.)	1	%	109	-	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-HCH	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-HCH	0.05	mg/kg	< 0.05	-	< 0.05	-
d-HCH	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	56	-	105	-
Tetrachloro-m-xylene (surr.)	1	%	86	-	98	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-

Client Sample ID			**SED01**	**SS01**	**ASSBH04_0.1-0.2**	**ASSBH06_0.6-0.8**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028854**	**B22-Jl0028855**	**B22-Jl0028856**	**B22-Jl0028857**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	57	-	93	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	62	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	1300	140	< 100
TRH >C34-C40	100	mg/kg	100	780	170	< 100
TRH >C10-C40 (total)*	100	mg/kg	100	2142	310	< 100
TRH - 2013 NEPM Fractions (after silica gel clean-up)						
TRH >C10-C16 (after silica gel clean-up)	50	mg/kg	< 50	-	-	-
TRH >C16-C34 (after silica gel clean-up)	100	mg/kg	< 100	-	-	-
TRH >C34-C40 (after silica gel clean-up)	100	mg/kg	< 100	-	-	-
TRH >C10-C40 (total) (after silica-gel clean up)*	100	mg/kg	< 100	-	-	-
TRH - 1999 NEPM Fractions (after silica gel clean-up)						
TRH C10-C14 (after silica gel clean-up)	20	mg/kg	< 20	-	-	-
TRH C15-C28 (after silica gel clean-up)	50	mg/kg	< 50	-	-	-
TRH C29-C36 (after silica gel clean-up)	50	mg/kg	< 50	-	-	-
TRH C10-C36 (Total) (after silica gel clean-up)	100	mg/kg	< 50	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	15	8.6	4.9	4.8
Cadmium	0.4	mg/kg	< 0.4	< 0.5	< 0.5	< 0.5
Chromium	5	mg/kg	10.0	18	20	14
Copper	5	mg/kg	23	18	9.8	< 5
Lead	5	mg/kg	9.9	22	9.4	6.4
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	10	18	14	< 5
Zinc	5	mg/kg	57	170	28	14

Client Sample ID			**SED01**	**SS01**	**ASSBH04_0.1-0.2**	**ASSBH06_0.6-0.8**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028854**	**B22-Jl0028855**	**B22-Jl0028856**	**B22-Jl0028857**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
% Moisture	1	%	89	40	29	26

Client Sample ID			**ASSBH10_0.25**	**ASSBH13_0.1-0.2**	**ASSBH06_0.1-0.2**	**QC01**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028858**	**B22-Jl0028859**	**B22-Jl0028860**	**B22-Jl0028861**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	69	< 100	64
TRH C29-C36	50	mg/kg	< 50	< 50	92	83
TRH C10-C36 (Total)	50	mg/kg	< 50	69	< 100	147
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	90	94	125
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.2
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	-	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	-	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Chrysene	0.5	mg/kg	-	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	< 0.5
Pyrene	0.5	mg/kg	-	-	-	< 0.5
Total PAH*	0.5	mg/kg	-	-	-	< 0.5

Client Sample ID			ASSBH10_0.25	ASSBH13_0.1-0.2	ASSBH06_0.1-0.2	QC01
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028858**	**B22-Jl0028859**	**B22-Jl0028860**	**B22-Jl0028861**
Date Sampled			Jul 12, 2022	Jul 12, 2022	Jul 12, 2022	Jul 12, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
2-Fluorobiphenyl (surr.)	1	%	-	-	-	88
p-Terphenyl-d14 (surr.)	1	%	-	-	-	94
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	87	100	93
Tetrachloro-m-xylene (surr.)	1	%	-	108	104	103
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2

Client Sample ID			ASSBH10_0.25	ASSBH13_0.1-0.2	ASSBH06_0.1-0.2	QC01
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Jl0028858**	**B22-Jl0028859**	**B22-Jl0028860**	**B22-Jl0028861**
Date Sampled			**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**	**Jul 12, 2022**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Malathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	< 2	< 2	< 2
Naled	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	-	< 2	< 2	< 2
Phorate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	80	96	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	150	110
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	150	230
Heavy Metals						
Arsenic	2	mg/kg	3.4	12	6.9	2.2
Cadmium	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	5	mg/kg	11	19	17	7.6
Copper	5	mg/kg	< 5	6.5	7.8	7.0
Lead	5	mg/kg	< 5	9.7	13	7.4
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	8.0	8.0	< 5
Zinc	5	mg/kg	10.0	19	17	120
% Moisture	1	%	22	28	26	31

Client Sample ID			QC03
Sample Matrix			**Soil**
Eurofins Sample No.			**B22-Jl0028862**
Date Sampled			**Jul 12, 2022**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	54
TRH C29-C36	50	mg/kg	52
TRH C10-C36 (Total)	50	mg/kg	106

Client Sample ID			**QC03**
Sample Matrix			**Soil**
Eurofins Sample No.			**B22-Jl0028862**
Date Sampled			**Jul 12, 2022**
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	54
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene^{N02}	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100
p-Terphenyl-d14 (surr.)	1	%	98
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-HCH	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-HCH	0.05	mg/kg	< 0.05
d-HCH	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05

Client Sample ID			**QC03**
Sample Matrix			**Soil**
Eurofins Sample No.			**B22-Jl0028862**
Date Sampled			**Jul 12, 2022**
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1
Dibutylchlorendate (surr.)	1	%	101
Tetrachloro-m-xylene (surr.)	1	%	108
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	82

Client Sample ID			**QC03**
Sample Matrix			**Soil**
Eurofins Sample No.			**B22-Jl0028862**
Date Sampled			**Jul 12, 2022**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Heavy Metals			
Arsenic	2	mg/kg	7.4
Cadmium	0.5	mg/kg	< 0.5
Chromium	5	mg/kg	16
Copper	5	mg/kg	9.1
Lead	5	mg/kg	11
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	9.9
Zinc	5	mg/kg	36
% Moisture	1	%	30

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B6			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 18, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 18, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 18, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Melbourne	Jul 18, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN			
BTEX	Melbourne	Jul 20, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH - Method: USEPA SW846 8260			
TRH - 2013 NEPM Fractions (after silica gel clean-up)	Melbourne	Jul 20, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
TRH - 1999 NEPM Fractions (after silica gel clean-up)	Melbourne	Jul 20, 2022	14 Days
- Method: TRH C6-C36 (Silica Gel Cleanup) - MGT 100A			
Eurofins Suite B10 (filtered metals)			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 18, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water - Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Organochlorine Pesticides	Melbourne	Jul 18, 2022	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270) - Method: LTM-ORG-2220 OCP and PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Jul 18, 2022	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270) - Method: LTM-ORG-2220 OCP and PCB in Soil and Water (USEPA 8270)			
% Moisture	Brisbane	Jul 14, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			

Company Name:	Easterly Point Environmental Pty Ltd	**Order No.:**	N/A	**Received:**	Jul 14, 2022 11:30 AM
Address:	1/64 Kingsley Street Byron Bay NSW 2481	**Report #:**	905836	**Due:**	Jul 21, 2022
		Phone:	02 6685 6681	**Priority:**	5 Day
		Fax:		**Contact Name:**	Hailey
Project Name:	YAMBA				
Project ID:	21029				

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028835						X	X		X				
2	BH01_0.2-0.3	Jul 12, 2022		Soil	B22-Jl0028836							X						X
3	BH02_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028837								X				X	
4	BH02_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028838		X											
5	BH03_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028839			X	X			X						X
6	BH03_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028840		X											
7	BH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028841								X		X			
8	BH04_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028842	X							X		X			
9	BH05_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028843							X						X
10	BH06_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028844	X							X		X			

Company Name: Easterly Point Environmental Pty Ltd
Address: 1/64 Kingsley Street
Byron Bay
NSW 2481

Project Name: YAMBA
Project ID: 21029

Order No.: N/A
Report #: 905836
Phone: 02 6685 6681
Fax:

Received: Jul 14, 2022 11:30 AM
Due: Jul 21, 2022
Priority: 5 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
11	BH06_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028845								X		X			
12	BH07_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028846	X							X		X			
13	BH07_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028847	X							X		X			
14	BH07_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028848								X		X			
15	BH08_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028849						X	X		X				
16	BH08_0.15-0.2	Jul 12, 2022		Soil	B22-Jl0028850						X	X		X				
17	BH08_0.4-0.45	Jul 12, 2022		Soil	B22-Jl0028851								X		X			
18	BH09_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028852								X		X			
19	BH09_0.2-0.25	Jul 12, 2022		Soil	B22-Jl0028853		X											
20	SED01	Jul 12, 2022		Soil	B22-Jl0028854						X	X		X				
21	SS01	Jul 12, 2022		Soil	B22-Jl0028855								X				X	
22	ASSBH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028856					X			X				X	

Company Name:	Easterly Point Environmental Pty Ltd	**Order No.:**	N/A	**Received:**	Jul 14, 2022 11:30 AM
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		Phone:	02 6685 6681	**Priority:**	5 Day
		Fax:		**Contact Name:**	Hailey
Project Name:	YAMBA				
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Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
23	ASSBH06_0.6-0.8	Jul 12, 2022		Soil	B22-Jl0028857								X				X	
24	ASSBH10_0.25	Jul 12, 2022		Soil	B22-Jl0028858								X				X	
25	ASSBH13_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028859					X			X				X	
26	ASSBH06_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028860					X			X				X	
27	QC01	Jul 12, 2022		Soil	B22-Jl0028861								X		X			
28	QC03	Jul 12, 2022		Soil	B22-Jl0028862								X		X			
29	QC05	Jul 12, 2022		Water	B22-Jl0028863											X		
Test Counts						4	3	1	4	4	4	25	25	15	15	1	7	3

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Aldrin and Dieldrin (Total)*	mg/kg	-			0.05	N/A	
DDT + DDE + DDD (Total)*	mg/kg	-			0.05	N/A	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	mg/kg	< 50			50	Pass	
TRH >C16-C34 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
TRH >C34-C40 (after silica gel clean-up)	mg/kg	< 100			100	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C14 (after silica gel clean-up)	mg/kg	< 20			20	Pass	
TRH C15-C28 (after silica gel clean-up)	mg/kg	< 50			50	Pass	
TRH C29-C36 (after silica gel clean-up)	mg/kg	< 50			50	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	110			70-130	Pass	
TRH C10-C14	%	73			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	105			70-130	Pass	
Toluene	%	105			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	105			70-130	Pass	
Xylenes - Total*	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	107			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	114			70-130	Pass	
Acenaphthylene	%	108			70-130	Pass	
Anthracene	%	119			70-130	Pass	
Benz(a)anthracene	%	120			70-130	Pass	
Benzo(a)pyrene	%	78			70-130	Pass	
Benzo(b&j)fluoranthene	%	116			70-130	Pass	
Benzo(g.h.i)perylene	%	82			70-130	Pass	
Benzo(k)fluoranthene	%	119			70-130	Pass	
Chrysene	%	122			70-130	Pass	
Dibenz(a.h)anthracene	%	106			70-130	Pass	
Fluoranthene	%	119			70-130	Pass	
Fluorene	%	107			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	107			70-130	Pass	
Naphthalene	%	114			70-130	Pass	
Phenanthrene	%	106			70-130	Pass	
Pyrene	%	122			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	118			70-130	Pass	
4.4'-DDD	%	120			70-130	Pass	
4.4'-DDE	%	123			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDT	%	125			70-130	Pass	
a-HCH	%	114			70-130	Pass	
Aldrin	%	119			70-130	Pass	
b-HCH	%	121			70-130	Pass	
d-HCH	%	117			70-130	Pass	
Dieldrin	%	114			70-130	Pass	
Endosulfan I	%	118			70-130	Pass	
Endosulfan II	%	115			70-130	Pass	
Endosulfan sulphate	%	122			70-130	Pass	
Endrin	%	113			70-130	Pass	
Endrin aldehyde	%	113			70-130	Pass	
Endrin ketone	%	123			70-130	Pass	
g-HCH (Lindane)	%	128			70-130	Pass	
Heptachlor	%	121			70-130	Pass	
Heptachlor epoxide	%	118			70-130	Pass	
Hexachlorobenzene	%	118			70-130	Pass	
Methoxychlor	%	118			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Azinphos-methyl	%	84			70-130	Pass	
Bolstar	%	97			70-130	Pass	
Chlorfenvinphos	%	86			70-130	Pass	
Chlorpyrifos	%	115			70-130	Pass	
Chlorpyrifos-methyl	%	101			70-130	Pass	
Coumaphos	%	71			70-130	Pass	
Demeton-S	%	72			70-130	Pass	
Demeton-O	%	82			70-130	Pass	
Diazinon	%	103			70-130	Pass	
Dichlorvos	%	98			70-130	Pass	
Dimethoate	%	90			70-130	Pass	
Disulfoton	%	92			70-130	Pass	
EPN	%	128			70-130	Pass	
Ethion	%	121			70-130	Pass	
Ethoprop	%	95			70-130	Pass	
Ethyl parathion	%	115			70-130	Pass	
Fenitrothion	%	122			70-130	Pass	
Fensulfothion	%	106			70-130	Pass	
Fenthion	%	102			70-130	Pass	
Malathion	%	130			70-130	Pass	
Methyl parathion	%	122			75-125	Pass	
Mevinphos	%	82			70-130	Pass	
Monocrotophos	%	72			70-130	Pass	
Naled	%	108			70-130	Pass	
Phorate	%	92			70-130	Pass	
Pirimiphos-methyl	%	97			70-130	Pass	
Pyrazophos	%	86			70-130	Pass	
Ronnel	%	104			70-130	Pass	
Terbufos	%	105			70-130	Pass	
Tetrachlorvinphos	%	98			70-130	Pass	
Tokuthion	%	109			70-130	Pass	
Trichloronate	%	107			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	76			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	%	82			70-130	Pass	
LCS - % Recovery							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C14 (after silica gel clean-up)	%	90			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	114			80-120	Pass	
Cadmium	%	107			80-120	Pass	
Chromium	%	111			80-120	Pass	
Copper	%	105			80-120	Pass	
Lead	%	111			80-120	Pass	
Mercury	%	115			80-120	Pass	
Nickel	%	105			80-120	Pass	
Zinc	%	104			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDT	B22-Jl0012841	NCP	%	118			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B22-Jl0028848	CP	%	97			70-130	Pass	
TRH C10-C14	B22-Jl0028848	CP	%	70			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B22-Jl0028848	CP	%	89			70-130	Pass	
Toluene	B22-Jl0028848	CP	%	95			70-130	Pass	
Ethylbenzene	B22-Jl0028848	CP	%	103			70-130	Pass	
m&p-Xylenes	B22-Jl0028848	CP	%	110			70-130	Pass	
o-Xylene	B22-Jl0028848	CP	%	113			70-130	Pass	
Xylenes - Total*	B22-Jl0028848	CP	%	111			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B22-Jl0028848	CP	%	96			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B22-Jl0028848	CP	%	96			70-130	Pass	
Acenaphthylene	B22-Jl0028848	CP	%	88			70-130	Pass	
Anthracene	B22-Jl0028848	CP	%	114			70-130	Pass	
Benz(a)anthracene	B22-Jl0028848	CP	%	106			70-130	Pass	
Benzo(b&j)fluoranthene	B22-Jl0028848	CP	%	108			70-130	Pass	
Benzo(k)fluoranthene	B22-Jl0028848	CP	%	94			70-130	Pass	
Chrysene	B22-Jl0028848	CP	%	108			70-130	Pass	
Fluoranthene	B22-Jl0028848	CP	%	106			70-130	Pass	
Fluorene	B22-Jl0028848	CP	%	88			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B22-Jl0028848	CP	%	83			70-130	Pass	
Naphthalene	B22-Jl0028848	CP	%	97			70-130	Pass	
Phenanthrene	B22-Jl0028848	CP	%	112			70-130	Pass	
Pyrene	B22-Jl0028848	CP	%	110			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	B22-Jl0028848	CP	%	100			70-130	Pass	
4.4'-DDD	B22-Jl0028848	CP	%	101			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDE	B22-Jl0028848	CP	%	108			70-130	Pass	
a-HCH	B22-Jl0028848	CP	%	99			70-130	Pass	
Aldrin	B22-Jl0028848	CP	%	100			70-130	Pass	
b-HCH	B22-Jl0028848	CP	%	104			70-130	Pass	
d-HCH	B22-Jl0028848	CP	%	99			70-130	Pass	
Dieldrin	B22-Jl0028848	CP	%	101			70-130	Pass	
Endosulfan I	B22-Jl0028848	CP	%	99			70-130	Pass	
Endosulfan II	B22-Jl0028848	CP	%	102			70-130	Pass	
Endosulfan sulphate	B22-Jl0028848	CP	%	101			70-130	Pass	
Endrin	B22-Jl0028848	CP	%	95			70-130	Pass	
Endrin aldehyde	B22-Jl0028848	CP	%	85			70-130	Pass	
Endrin ketone	B22-Jl0028848	CP	%	101			70-130	Pass	
g-HCH (Lindane)	B22-Jl0028848	CP	%	93			70-130	Pass	
Heptachlor	B22-Jl0028848	CP	%	101			70-130	Pass	
Heptachlor epoxide	B22-Jl0028848	CP	%	101			70-130	Pass	
Hexachlorobenzene	B22-Jl0028848	CP	%	102			70-130	Pass	
Methoxychlor	B22-Jl0028848	CP	%	120			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Azinphos-methyl	B22-Jl0028848	CP	%	78			70-130	Pass	
Bolstar	B22-Jl0028848	CP	%	81			70-130	Pass	
Chlorpyrifos	B22-Jl0028848	CP	%	96			70-130	Pass	
Chlorpyrifos-methyl	B22-Jl0028848	CP	%	82			70-130	Pass	
Diazinon	B22-Jl0028848	CP	%	82			70-130	Pass	
Dichlorvos	B22-Jl0028848	CP	%	72			70-130	Pass	
Disulfoton	B22-Jl0028848	CP	%	76			70-130	Pass	
EPN	B22-Jl0028848	CP	%	128			70-130	Pass	
Ethion	B22-Jl0028848	CP	%	96			70-130	Pass	
Ethoprop	B22-Jl0028848	CP	%	73			70-130	Pass	
Ethyl parathion	B22-Jl0028848	CP	%	110			70-130	Pass	
Fenitrothion	B22-Jl0028848	CP	%	97			70-130	Pass	
Fensulfothion	B22-Jl0028848	CP	%	76			70-130	Pass	
Fenthion	B22-Jl0028848	CP	%	81			70-130	Pass	
Malathion	B22-Jl0028848	CP	%	103			70-130	Pass	
Methyl parathion	B22-Jl0028848	CP	%	93			70-130	Pass	
Naled	B22-Jl0028848	CP	%	102			70-130	Pass	
Phorate	B22-Jl0028848	CP	%	76			70-130	Pass	
Pirimiphos-methyl	B22-Jl0028848	CP	%	76			70-130	Pass	
Ronnel	B22-Jl0028848	CP	%	86			70-130	Pass	
Terbufos	B22-Jl0028848	CP	%	77			70-130	Pass	
Tokuthion	B22-Jl0028848	CP	%	90			70-130	Pass	
Trichloronate	B22-Jl0028848	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B22-Jl0028848	CP	%	74			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B22-Jl0028848	CP	%	106			75-125	Pass	
Cadmium	B22-Jl0028848	CP	%	102			75-125	Pass	
Chromium	B22-Jl0028848	CP	%	102			75-125	Pass	
Copper	B22-Jl0028848	CP	%	100			75-125	Pass	
Lead	B22-Jl0028848	CP	%	107			75-125	Pass	
Mercury	B22-Jl0028848	CP	%	122			75-125	Pass	
Nickel	B22-Jl0028848	CP	%	99			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc	B22-Jl0028848	CP	%	104			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B22-Jl0028855	CP	%	104			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B22-Jl0028855	CP	%	99			70-130	Pass	
Toluene	B22-Jl0028855	CP	%	100			70-130	Pass	
Ethylbenzene	B22-Jl0028855	CP	%	102			70-130	Pass	
m&p-Xylenes	B22-Jl0028855	CP	%	103			70-130	Pass	
o-Xylene	B22-Jl0028855	CP	%	101			70-130	Pass	
Xylenes - Total*	B22-Jl0028855	CP	%	103			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B22-Jl0028855	CP	%	103			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B22-Jl0028862	CP	%	94			70-130	Pass	
TRH C10-C14	B22-Jl0028862	CP	%	71			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B22-Jl0028862	CP	%	86			70-130	Pass	
Toluene	B22-Jl0028862	CP	%	89			70-130	Pass	
Ethylbenzene	B22-Jl0028862	CP	%	88			70-130	Pass	
m&p-Xylenes	B22-Jl0028862	CP	%	91			70-130	Pass	
o-Xylene	B22-Jl0028862	CP	%	90			70-130	Pass	
Xylenes - Total*	B22-Jl0028862	CP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B22-Jl0028862	CP	%	95			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B22-Jl0028862	CP	%	108			70-130	Pass	
Acenaphthylene	B22-Jl0028862	CP	%	103			70-130	Pass	
Anthracene	B22-Jl0028862	CP	%	106			70-130	Pass	
Benz(a)anthracene	B22-Jl0028862	CP	%	111			70-130	Pass	
Benzo(a)pyrene	B22-Jl0028862	CP	%	101			70-130	Pass	
Benzo(b&j)fluoranthene	B22-Jl0028862	CP	%	115			70-130	Pass	
Benzo(g.h.i)perylene	B22-Jl0028862	CP	%	89			70-130	Pass	
Benzo(k)fluoranthene	B22-Jl0028862	CP	%	112			70-130	Pass	
Chrysene	B22-Jl0028862	CP	%	113			70-130	Pass	
Dibenz(a.h)anthracene	B22-Jl0028862	CP	%	82			70-130	Pass	
Fluoranthene	B22-Jl0028862	CP	%	113			70-130	Pass	
Fluorene	B22-Jl0028862	CP	%	105			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B22-Jl0028862	CP	%	110			70-130	Pass	
Naphthalene	B22-Jl0028862	CP	%	112			70-130	Pass	
Phenanthrene	B22-Jl0028862	CP	%	93			70-130	Pass	
Pyrene	B22-Jl0028862	CP	%	113			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	B22-Jl0028862	CP	%	118			70-130	Pass	
4.4'-DDD	B22-Jl0028862	CP	%	117			70-130	Pass	
4.4'-DDE	B22-Jl0028862	CP	%	120			70-130	Pass	
a-HCH	B22-Jl0028862	CP	%	111			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aldrin	B22-Jl0028862	CP	%	113			70-130	Pass	
b-HCH	B22-Jl0028862	CP	%	113			70-130	Pass	
d-HCH	B22-Jl0028862	CP	%	112			70-130	Pass	
Dieldrin	B22-Jl0028862	CP	%	116			70-130	Pass	
Endosulfan I	B22-Jl0028862	CP	%	112			70-130	Pass	
Endosulfan II	B22-Jl0028862	CP	%	107			70-130	Pass	
Endosulfan sulphate	B22-Jl0028862	CP	%	121			70-130	Pass	
Endrin	B22-Jl0028862	CP	%	121			70-130	Pass	
Endrin aldehyde	B22-Jl0028862	CP	%	100			70-130	Pass	
Endrin ketone	B22-Jl0028862	CP	%	121			70-130	Pass	
g-HCH (Lindane)	B22-Jl0028862	CP	%	125			70-130	Pass	
Heptachlor	B22-Jl0028862	CP	%	118			70-130	Pass	
Heptachlor epoxide	B22-Jl0028862	CP	%	117			70-130	Pass	
Hexachlorobenzene	B22-Jl0028862	CP	%	115			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Azinphos-methyl	B22-Jl0028862	CP	%	115			70-130	Pass	
Bolstar	B22-Jl0028862	CP	%	95			70-130	Pass	
Chlorfenvinphos	B22-Jl0028862	CP	%	92			70-130	Pass	
Chlorpyrifos	B22-Jl0028862	CP	%	109			70-130	Pass	
Chlorpyrifos-methyl	B22-Jl0028862	CP	%	99			70-130	Pass	
Coumaphos	B22-Jl0028862	CP	%	105			70-130	Pass	
Demeton-O	B22-Jl0028862	CP	%	78			70-130	Pass	
Diazinon	B22-Jl0028862	CP	%	98			70-130	Pass	
Dichlorvos	B22-Jl0028862	CP	%	92			70-130	Pass	
Dimethoate	B22-Jl0028862	CP	%	88			70-130	Pass	
Disulfoton	B22-Jl0028862	CP	%	86			70-130	Pass	
Ethion	B22-Jl0028862	CP	%	127			70-130	Pass	
Ethoprop	B22-Jl0028862	CP	%	93			70-130	Pass	
Fenitrothion	B22-Jl0028862	CP	%	121			70-130	Pass	
Fensulfothion	B22-Jl0028862	CP	%	113			70-130	Pass	
Fenthion	B22-Jl0028862	CP	%	98			70-130	Pass	
Malathion	B22-Jl0028862	CP	%	129			70-130	Pass	
Methyl parathion	B22-Jl0028862	CP	%	123			70-130	Pass	
Mevinphos	B22-Jl0028862	CP	%	77			70-130	Pass	
Monocrotophos	B22-Jl0028862	CP	%	70			70-130	Pass	
Naled	B22-Jl0028862	CP	%	115			70-130	Pass	
Phorate	B22-Jl0028862	CP	%	89			70-130	Pass	
Pirimiphos-methyl	B22-Jl0028862	CP	%	95			70-130	Pass	
Pyrazophos	B22-Jl0028862	CP	%	101			70-130	Pass	
Ronnel	B22-Jl0028862	CP	%	101			70-130	Pass	
Terbufos	B22-Jl0028862	CP	%	110			70-130	Pass	
Tetrachlorvinphos	B22-Jl0028862	CP	%	102			70-130	Pass	
Tokuthion	B22-Jl0028862	CP	%	108			70-130	Pass	
Trichloronate	B22-Jl0028862	CP	%	103			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B22-Jl0028862	CP	%	71			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B22-Jl0028862	CP	%	107			75-125	Pass	
Cadmium	B22-Jl0028862	CP	%	101			75-125	Pass	
Chromium	B22-Jl0028862	CP	%	97			75-125	Pass	
Copper	B22-Jl0028862	CP	%	93			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead	B22-Jl0028862	CP	%	100			75-125	Pass	
Mercury	B22-Jl0028862	CP	%	119			75-125	Pass	
Nickel	B22-Jl0028862	CP	%	98			75-125	Pass	
Zinc	B22-Jl0028862	CP	%	87			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B22-Jl0028841	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B22-Jl0028841	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B22-Jl0028841	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B22-Jl0028841	CP	mg/kg	51	57	12	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B22-Jl0028841	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B22-Jl0028841	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B22-Jl0028841	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B22-Jl0028841	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Acenaphthylene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Anthracene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Benz(a)anthracene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Benzo(a)pyrene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Benzo(b&j)fluoranthene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Benzo(g.h.i)perylene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Benzo(k)fluoranthene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Chrysene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Dibenz(a.h)anthracene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Fluoranthene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Fluorene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Naphthalene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Phenanthrene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pyrene	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B22-Jl0028841	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
4.4'-DDD	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDE	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDT	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
a-HCH	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aldrin	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
b-HCH	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
d-HCH	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Dieldrin	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endosulfan I	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endosulfan II	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan sulphate	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endrin	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endrin aldehyde	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Endrin ketone	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
g-HCH (Lindane)	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Heptachlor	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Heptachlor epoxide	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Hexachlorobenzene	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Methoxychlor	B22-Jl0028841	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Bolstar	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Chlorfenvinphos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Chlorpyrifos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Chlorpyrifos-methyl	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Coumaphos	B22-Jl0028841	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Demeton-O	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Diazinon	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Dichlorvos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Dimethoate	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Disulfoton	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
EPN	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Ethion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Ethoprop	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Ethyl parathion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Fenitrothion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Fensulfothion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Fenthion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Malathion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Merphos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Methyl parathion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Mevinphos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Monocrotophos	B22-Jl0028841	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Omethoate	B22-Jl0028841	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pirimiphos-methyl	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pyrazophos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Ronnel	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Terbufos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorvinphos	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tokuthion	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Trichloronate	B22-Jl0028841	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B22-Jl0028841	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B22-Jl0028841	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B22-Jl0028841	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
TRH - 2013 NEPM Fractions (after silica gel clean-up)				Result 1	Result 2	RPD			
TRH >C10-C16 (after silica gel clean-up)	M22-Jl0043450	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34 (after silica gel clean-up)	M22-Jl0043450	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40 (after silica gel clean-up)	M22-Jl0043450	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
TRH - 1999 NEPM Fractions (after silica gel clean-up)				Result 1	Result 2	RPD			
TRH C10-C14 (after silica gel clean-up)	M22-Jl0043450	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28 (after silica gel clean-up)	M22-Jl0043450	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36 (after silica gel clean-up)	M22-Jl0043450	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C10-C36 (Total) (after silica gel clean-up)	M22-Jl0043450	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B22-Jl0028844	CP	mg/kg	15	15	4.3	30%	Pass	
Cadmium	B22-Jl0028844	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chromium	B22-Jl0028844	CP	mg/kg	27	31	13	30%	Pass	
Copper	B22-Jl0028844	CP	mg/kg	17	20	16	30%	Pass	
Lead	B22-Jl0028844	CP	mg/kg	75	82	9.8	30%	Pass	
Mercury	B22-Jl0028844	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B22-Jl0028844	CP	mg/kg	6.7	8.3	21	30%	Pass	
Zinc	B22-Jl0028844	CP	mg/kg	290	360	21	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B22-Jl0028847	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B22-Jl0028847	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B22-Jl0028847	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B22-Jl0028847	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B22-Jl0028847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B22-Jl0028847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B22-Jl0028847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B22-Jl0028847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B22-Jl0028847	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B22-Jl0028847	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Fluoranthene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B22-Jl0028847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	B22-Jl0028847	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	B22-Jl0028847	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	B22-Jl0028847	CP	mg/kg	< 2	< 2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Naled	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	B22-Jl0028847	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	B22-Jl0028847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B22-Jl0028847	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B22-Jl0028847	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B22-Jl0028847	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B22-Jl0028847	CP	mg/kg	6.3	6.6	4.3	30%	Pass	
Cadmium	B22-Jl0028847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chromium	B22-Jl0028847	CP	mg/kg	20	19	2.6	30%	Pass	
Copper	B22-Jl0028847	CP	mg/kg	17	16	7.8	30%	Pass	
Lead	B22-Jl0028847	CP	mg/kg	150	130	16	30%	Pass	
Nickel	B22-Jl0028847	CP	mg/kg	7.4	7.1	3.5	30%	Pass	
Zinc	B22-Jl0028847	CP	mg/kg	190	180	1.9	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B22-Jl0028851	CP	%	26	28	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B22-Jl0028854	CP	%	89	89	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B22-Jl0028857	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B22-Jl0028857	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B22-Jl0028857	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B22-Jl0028857	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B22-Jl0028857	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B22-Jl0028857	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B22-Jl0028857	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B22-Jl0028857	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B22-Jl0028857	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Emma Beesley	Analytical Services Manager
Angelique Lang-Frey	Senior Analyst-Metal
Edward Lee	Senior Analyst-Organic
Harry Bacalis	Senior Analyst-Volatile
Jonathon Angell	Senior Analyst-Organic
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Organic
Joseph Edouard	Senior Analyst-Volatile
Linda Chouman	Senior Analyst-Sample Properties
Mary Makarios	Senior Analyst-Metal
Mele Singh	Senior Analyst-Organic
Mele Singh	Senior Analyst-Volatile
Sayeed Abu	Senior Analyst-Asbestos

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

Easterly Point Environmental Pty Ltd
1/64 Kingsley Street
Byron Bay
NSW 2481

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention:	Hailey
Report	905836-AID
Project Name	YAMBA
Project ID	21029
Received Date	Jul 14, 2022
Date Reported	Jul 28, 2022

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name YAMBA
Project ID 21029
Date Sampled Jul 12, 2022
Report 905836-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH04_0.3-0.35	22-JI0028842	Jul 12, 2022	Approximate Sample 49g Sample consisted of: Brown coarse-grained soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH06_0.0-0.1	22-JI0028844	Jul 12, 2022	Approximate Sample 21g Sample consisted of: Grey fine-grained clayey soil, plant residue and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH07_0.0-0.1	22-JI0028846	Jul 12, 2022	Approximate Sample 43g Sample consisted of: Grey fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH07_0.15-0.25	22-JI0028847	Jul 12, 2022	Approximate Sample 27g Sample consisted of: Grey fine-grained clayey soil, charcoal and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 14, 2022	Indefinite

Company Name: Easterly Point Environmental Pty Ltd
Address: 1/64 Kingsley Street
Byron Bay
NSW 2481

Project Name: YAMBA
Project ID: 21029

Order No.: N/A
Report #: 905836
Phone: 02 6685 6681
Fax:

Received: Jul 14, 2022 11:30 AM
Due: Jul 21, 2022
Priority: 5 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028835						X	X		X				
2	BH01_0.2-0.3	Jul 12, 2022		Soil	B22-Jl0028836							X						X
3	BH02_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028837								X				X	
4	BH02_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028838		X											
5	BH03_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028839			X	X			X						X
6	BH03_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028840		X											
7	BH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028841								X		X			
8	BH04_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028842	X							X		X			
9	BH05_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028843							X						X
10	BH06_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028844	X							X		X			

Company Name: Easterly Point Environmental Pty Ltd
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NSW 2481

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Phone: 02 6685 6681
Fax:

Received: Jul 14, 2022 11:30 AM
Due: Jul 21, 2022
Priority: 5 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
11	BH06_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028845								X		X			
12	BH07_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028846	X							X		X			
13	BH07_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028847	X							X		X			
14	BH07_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028848								X		X			
15	BH08_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028849						X	X		X				
16	BH08_0.15-0.2	Jul 12, 2022		Soil	B22-Jl0028850						X	X		X				
17	BH08_0.4-0.45	Jul 12, 2022		Soil	B22-Jl0028851								X		X			
18	BH09_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028852								X		X			
19	BH09_0.2-0.25	Jul 12, 2022		Soil	B22-Jl0028853		X											
20	SED01	Jul 12, 2022		Soil	B22-Jl0028854						X	X		X				
21	SS01	Jul 12, 2022		Soil	B22-Jl0028855								X				X	
22	ASSBH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028856					X			X				X	

Company Name: Easterly Point Environmental Pty Ltd
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Phone: 02 6685 6681
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Received: Jul 14, 2022 11:30 AM
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Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
23	ASSBH06_0.6 -0.8	Jul 12, 2022		Soil	B22-Jl0028857								X				X	
24	ASSBH10_0.2 5	Jul 12, 2022		Soil	B22-Jl0028858								X				X	
25	ASSBH13_0.1 -0.2	Jul 12, 2022		Soil	B22-Jl0028859					X			X				X	
26	ASSBH06_0.1 -0.2	Jul 12, 2022		Soil	B22-Jl0028860					X			X				X	
27	QC01	Jul 12, 2022		Soil	B22-Jl0028861								X		X			
28	QC03	Jul 12, 2022		Soil	B22-Jl0028862								X		X			
29	QC05	Jul 12, 2022		Water	B22-Jl0028863											X		
Test Counts						4	3	1	4	4	4	25	25	15	15	1	7	3

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation.
6. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V = r x t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\,w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w**).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

eurofins

Environment Testing

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Easterly Point Environmental Pty Ltd
1/64 Kingsley Street
Byron Bay
NSW 2481

Attention:	**Hailey**
Report	**905836-W**
Project name	YAMBA
Project ID	21029
Received Date	Jul 14, 2022

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**QC05** **Water** **B22-Jl0028863** **Jul 12, 2022**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	95
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001

Client Sample ID			**QC05**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-Jl0028863**
Date Sampled			**Jul 12, 2022**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	84
p-Terphenyl-d14 (surr.)	1	%	98
Organochlorine Pesticides			
Chlordanes - Total	0.002	mg/L	< 0.002
4.4'-DDD	0.0002	mg/L	< 0.0002
4.4'-DDE	0.0002	mg/L	< 0.0002
4.4'-DDT	0.0002	mg/L	< 0.0002
a-HCH	0.0002	mg/L	< 0.0002
Aldrin	0.0002	mg/L	< 0.0002
b-HCH	0.0002	mg/L	< 0.0002
d-HCH	0.0002	mg/L	< 0.0002
Dieldrin	0.0002	mg/L	< 0.0002
Endosulfan I	0.0002	mg/L	< 0.0002
Endosulfan II	0.0002	mg/L	< 0.0002
Endosulfan sulphate	0.0002	mg/L	< 0.0002
Endrin	0.0002	mg/L	< 0.0002
Endrin aldehyde	0.0002	mg/L	< 0.0002
Endrin ketone	0.0002	mg/L	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	< 0.0002
Heptachlor	0.0002	mg/L	< 0.0002
Heptachlor epoxide	0.0002	mg/L	< 0.0002
Hexachlorobenzene	0.0002	mg/L	< 0.0002
Methoxychlor	0.0002	mg/L	< 0.0002
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002
Dibutylchlorendate (surr.)	1	%	93
Tetrachloro-m-xylene (surr.)	1	%	76
Organophosphorus Pesticides			
Azinphos-methyl	0.002	mg/L	< 0.002
Bolstar	0.002	mg/L	< 0.002
Chlorfenvinphos	0.02	mg/L	< 0.02
Chlorpyrifos	0.002	mg/L	< 0.002
Chlorpyrifos-methyl	0.002	mg/L	< 0.002
Coumaphos	0.02	mg/L	< 0.02
Demeton-S	0.002	mg/L	< 0.002
Demeton-O	0.002	mg/L	< 0.002
Diazinon	0.002	mg/L	< 0.002
Dichlorvos	0.002	mg/L	< 0.002
Dimethoate	0.002	mg/L	< 0.002
Disulfoton	0.002	mg/L	< 0.002
EPN	0.002	mg/L	< 0.002
Ethion	0.002	mg/L	< 0.002
Ethoprop	0.002	mg/L	< 0.002
Ethyl parathion	0.002	mg/L	< 0.002
Fenitrothion	0.002	mg/L	< 0.002
Fensulfothion	0.002	mg/L	< 0.002

Client Sample ID			**QC05**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-Jl0028863**
Date Sampled			**Jul 12, 2022**
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Fenthion	0.002	mg/L	< 0.002
Malathion	0.002	mg/L	< 0.002
Merphos	0.002	mg/L	< 0.002
Methyl parathion	0.002	mg/L	< 0.002
Mevinphos	0.002	mg/L	< 0.002
Monocrotophos	0.002	mg/L	< 0.002
Naled	0.002	mg/L	< 0.002
Omethoate	0.02	mg/L	< 0.02
Phorate	0.002	mg/L	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02
Pyrazophos	0.002	mg/L	< 0.002
Ronnel	0.002	mg/L	< 0.002
Terbufos	0.002	mg/L	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002
Tokuthion	0.002	mg/L	< 0.002
Trichloronate	0.002	mg/L	< 0.002
Triphenylphosphate (surr.)	1	%	57
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001
Zinc (filtered)	0.005	mg/L	< 0.005

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B6			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 18, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Jul 15, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 18, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN			
BTEX	Brisbane	Jul 15, 2022	14 Days
- Method: USEPA SW846 8260			
Eurofins Suite B10 (filtered metals)			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 18, 2022	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Melbourne	Jul 18, 2022	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Jul 18, 2022	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8270)			
Metals M8 filtered	Melbourne	Jul 18, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

Company Name: Easterly Point Environmental Pty Ltd
Address: 1/64 Kingsley Street
Byron Bay
NSW 2481

Project Name: YAMBA
Project ID: 21029

Order No.: N/A
Report #: 905836
Phone: 02 6685 6681
Fax:

Received: Jul 14, 2022 11:30 AM
Due: Jul 21, 2022
Priority: 5 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028835						X	X		X				
2	BH01_0.2-0.3	Jul 12, 2022		Soil	B22-Jl0028836							X						X
3	BH02_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028837								X				X	
4	BH02_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028838		X											
5	BH03_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028839			X	X			X						X
6	BH03_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028840		X											
7	BH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028841								X		X			
8	BH04_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028842	X							X		X			
9	BH05_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028843							X						X
10	BH06_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028844	X							X		X			

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
11	BH06_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028845								X		X			
12	BH07_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028846	X							X		X			
13	BH07_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028847	X							X		X			
14	BH07_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028848								X		X			
15	BH08_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028849						X	X		X				
16	BH08_0.15-0.2	Jul 12, 2022		Soil	B22-Jl0028850						X	X		X				
17	BH08_0.4-0.45	Jul 12, 2022		Soil	B22-Jl0028851								X		X			
18	BH09_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028852								X		X			
19	BH09_0.2-0.25	Jul 12, 2022		Soil	B22-Jl0028853		X											
20	SED01	Jul 12, 2022		Soil	B22-Jl0028854						X	X		X				
21	SS01	Jul 12, 2022		Soil	B22-Jl0028855								X				X	
22	ASSBH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028856					X			X				X	

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
23	ASSBH06_0.6 -0.8	Jul 12, 2022		Soil	B22-Jl0028857								X				X	
24	ASSBH10_0.2 5	Jul 12, 2022		Soil	B22-Jl0028858								X				X	
25	ASSBH13_0.1 -0.2	Jul 12, 2022		Soil	B22-Jl0028859					X			X				X	
26	ASSBH06_0.1 -0.2	Jul 12, 2022		Soil	B22-Jl0028860					X			X				X	
27	QC01	Jul 12, 2022		Soil	B22-Jl0028861								X		X			
28	QC03	Jul 12, 2022		Soil	B22-Jl0028862								X		X			
29	QC05	Jul 12, 2022		Water	B22-Jl0028863											X		
Test Counts						4	3	1	4	4	4	25	25	15	15	1	7	3

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
μg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDE	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDT	mg/L	< 0.0002			0.0002	Pass	
a-HCH	mg/L	< 0.0002			0.0002	Pass	
Aldrin	mg/L	< 0.0002			0.0002	Pass	
b-HCH	mg/L	< 0.0002			0.0002	Pass	
d-HCH	mg/L	< 0.0002			0.0002	Pass	
Dieldrin	mg/L	< 0.0002			0.0002	Pass	
Endosulfan I	mg/L	< 0.0002			0.0002	Pass	
Endosulfan II	mg/L	< 0.0002			0.0002	Pass	
Endosulfan sulphate	mg/L	< 0.0002			0.0002	Pass	
Endrin	mg/L	< 0.0002			0.0002	Pass	
Endrin aldehyde	mg/L	< 0.0002			0.0002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/L	< 0.0002			0.0002	Pass	
g-HCH (Lindane)	mg/L	< 0.0002			0.0002	Pass	
Heptachlor	mg/L	< 0.0002			0.0002	Pass	
Heptachlor epoxide	mg/L	< 0.0002			0.0002	Pass	
Hexachlorobenzene	mg/L	< 0.0002			0.0002	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.002			0.002	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.02			0.02	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	83			70-130	Pass	
TRH C10-C14	%	100			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	86			70-130	Pass	
Ethylbenzene	%	88			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Xylenes - Total*	%	89			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	84			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	93			70-130	Pass	
Acenaphthylene	%	73			70-130	Pass	
Anthracene	%	82			70-130	Pass	
Benz(a)anthracene	%	79			70-130	Pass	
Benzo(a)pyrene	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	%	76			70-130	Pass	
Benzo(g.h.i)perylene	%	83			70-130	Pass	
Benzo(k)fluoranthene	%	97			70-130	Pass	
Chrysene	%	120			70-130	Pass	
Dibenz(a.h)anthracene	%	81			70-130	Pass	
Fluoranthene	%	89			70-130	Pass	
Fluorene	%	91			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	85			70-130	Pass	
Naphthalene	%	98			70-130	Pass	
Phenanthrene	%	79			70-130	Pass	
Pyrene	%	91			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	98			70-130	Pass	
4.4'-DDD	%	97			70-130	Pass	
4.4'-DDE	%	109			70-130	Pass	
4.4'-DDT	%	121			70-130	Pass	
a-HCH	%	123			70-130	Pass	
Aldrin	%	107			70-130	Pass	
b-HCH	%	101			70-130	Pass	
d-HCH	%	106			70-130	Pass	
Dieldrin	%	106			70-130	Pass	
Endosulfan I	%	102			70-130	Pass	
Endosulfan II	%	102			70-130	Pass	
Endosulfan sulphate	%	112			70-130	Pass	
Endrin	%	106			70-130	Pass	
Endrin aldehyde	%	96			70-130	Pass	
Endrin ketone	%	111			70-130	Pass	
g-HCH (Lindane)	%	102			70-130	Pass	
Heptachlor	%	117			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor epoxide	%	119			70-130	Pass	
Hexachlorobenzene	%	118			70-130	Pass	
Methoxychlor	%	112			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	75			70-130	Pass	
Mevinphos	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	109			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	94			80-120	Pass	
Cadmium (filtered)	%	99			80-120	Pass	
Chromium (filtered)	%	110			80-120	Pass	
Copper (filtered)	%	94			80-120	Pass	
Lead (filtered)	%	92			80-120	Pass	
Mercury (filtered)	%	89			80-120	Pass	
Nickel (filtered)	%	94			80-120	Pass	
Zinc (filtered)	%	96			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B22-Jl0030738	NCP	%	76			70-130	Pass	
TRH C10-C14	M22-Jl0047654	NCP	%	92			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B22-Jl0030738	NCP	%	79			70-130	Pass	
Toluene	B22-Jl0030738	NCP	%	80			70-130	Pass	
Ethylbenzene	B22-Jl0030738	NCP	%	82			70-130	Pass	
m&p-Xylenes	B22-Jl0030738	NCP	%	83			70-130	Pass	
o-Xylene	B22-Jl0030738	NCP	%	82			70-130	Pass	
Xylenes - Total*	B22-Jl0030738	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B22-Jl0030738	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M22-Jl0047654	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M22-Jl0029706	NCP	%	103			75-125	Pass	
Cadmium (filtered)	M22-Jl0029706	NCP	%	101			75-125	Pass	
Chromium (filtered)	M22-Jl0029706	NCP	%	114			75-125	Pass	
Copper (filtered)	M22-Jl0029706	NCP	%	96			75-125	Pass	
Lead (filtered)	M22-Jl0029706	NCP	%	95			75-125	Pass	
Mercury (filtered)	M22-Jl0029706	NCP	%	77			75-125	Pass	
Nickel (filtered)	M22-Jl0029706	NCP	%	96			75-125	Pass	
Zinc (filtered)	M22-Jl0029706	NCP	%	88			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B22-Jl0030397	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M22-Jl0047651	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M22-Jl0047651	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M22-Jl0047651	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B22-Jl0030397	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	B22-Jl0030397	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	B22-Jl0030397	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	B22-Jl0030397	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	B22-Jl0030397	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	B22-Jl0030397	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B22-Jl0030397	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	B22-Jl0030397	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	B22-Jl0026997	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
4.4'-DDD	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDE	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDT	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
a-HCH	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Aldrin	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
b-HCH	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
d-HCH	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Dieldrin	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan I	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan II	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan sulphate	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin aldehyde	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin ketone	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
g-HCH (Lindane)	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Heptachlor	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Hexachlorobenzene	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Methoxychlor	B22-Jl0026997	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Bolstar	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorfenvinphos	B22-Jl0026997	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chlorpyrifos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorpyrifos-methyl	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Coumaphos	B22-Jl0026997	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-S	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Demeton-O	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Diazinon	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dichlorvos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dimethoate	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Disulfoton	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
EPN	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethoprop	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethyl parathion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenitrothion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fensulfothion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenthion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Malathion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Merphos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methyl parathion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Mevinphos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Monocrotophos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Naled	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Omethoate	B22-Jl0026997	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phorate	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Pirimiphos-methyl	B22-Jl0026997	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Pyrazophos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ronnel	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Terbufos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tetrachlorvinphos	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tokuthion	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Trichloronate	B22-Jl0026997	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M22-Jl0047651	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M22-Jl0047651	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M22-Jl0047651	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M22-Jl0029706	NCP	mg/L	0.001	0.001	10	30%	Pass	
Cadmium (filtered)	M22-Jl0029706	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M22-Jl0029706	NCP	mg/L	0.001	0.001	9.9	30%	Pass	
Copper (filtered)	M22-Jl0029706	NCP	mg/L	0.010	0.010	1.5	30%	Pass	
Lead (filtered)	M22-Jl0029706	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	M22-Jl0029706	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M22-Jl0029706	NCP	mg/L	0.009	0.009	2.4	30%	Pass	
Zinc (filtered)	M22-Jl0029706	NCP	mg/L	0.14	0.14	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Emma Beesley	Analytical Services Manager
Jonathon Angell	Senior Analyst-Volatile
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Metal

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

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Company Name: Easterly Point Environmental Pty Ltd
Address: 1/64 Kingsley Street
Byron Bay
NSW 2481

Project Name: YAMBA
Project ID: 21029

Order No.: N/A
Report #: 905836
Phone: 02 6685 6681
Fax:

Received: Jul 14, 2022 11:30 AM
Due: Jul 21, 2022
Priority: 5 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028835						X	X		X				
2	BH01_0.2-0.3	Jul 12, 2022		Soil	B22-Jl0028836							X						X
3	BH02_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028837								X				X	
4	BH02_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028838		X											
5	BH03_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028839			X	X			X						X
6	BH03_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028840		X											
7	BH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028841								X		X			
8	BH04_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028842	X							X		X			
9	BH05_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028843							X						X
10	BH06_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028844	X							X		X			

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Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
11	BH06_0.3-0.4	Jul 12, 2022		Soil	B22-Jl0028845								X		X			
12	BH07_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028846	X							X		X			
13	BH07_0.15-0.25	Jul 12, 2022		Soil	B22-Jl0028847	X							X		X			
14	BH07_0.3-0.35	Jul 12, 2022		Soil	B22-Jl0028848								X		X			
15	BH08_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028849						X	X		X				
16	BH08_0.15-0.2	Jul 12, 2022		Soil	B22-Jl0028850						X	X		X				
17	BH08_0.4-0.45	Jul 12, 2022		Soil	B22-Jl0028851								X		X			
18	BH09_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0028852								X		X			
19	BH09_0.2-0.25	Jul 12, 2022		Soil	B22-Jl0028853		X											
20	SED01	Jul 12, 2022		Soil	B22-Jl0028854						X	X		X				
21	SS01	Jul 12, 2022		Soil	B22-Jl0028855								X				X	
22	ASSBH04_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028856					X			X				X	

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Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B14: OCP/OPP	Suite B14: OCP/OPP	TRH (after Silica Gel cleanup)	Moisture Set	Moisture Set	Eurofins Suite B10	Eurofins Suite B10	Eurofins Suite B10 (filtered metals)	Eurofins Suite B6	Eurofins Suite B1SG: TRH (With Silica Gel Clean up), BTEXN
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X												
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X	X	X	X	X	X	X
23	ASSBH06_0.6-0.8	Jul 12, 2022		Soil	B22-Jl0028857								X				X	
24	ASSBH10_0.25	Jul 12, 2022		Soil	B22-Jl0028858								X				X	
25	ASSBH13_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028859					X			X				X	
26	ASSBH06_0.1-0.2	Jul 12, 2022		Soil	B22-Jl0028860					X			X				X	
27	QC01	Jul 12, 2022		Soil	B22-Jl0028861								X		X			
28	QC03	Jul 12, 2022		Soil	B22-Jl0028862								X		X			
29	QC05	Jul 12, 2022		Water	B22-Jl0028863											X		
Test Counts						4	3	1	4	4	4	25	25	15	15	1	7	3

Sample Receipt Advice

Company name:	Easterly Point Environmental Pty Ltd
Contact name:	Hailey
Project name:	YAMBA
Project ID:	21029
Turnaround time:	5 Day
Date/Time received	Jul 14, 2022 11:30 AM
Eurofins reference	905836

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✓	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

QC02 and QC04 have been forwarded to ALS as requested. There is insufficient sample for asbestos testing with WA guidelines, so samples have been submitted for regular asbestos analysis.

Contact

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

Robert Biviano on phone : or by email: RobertoBiviano@eurofins.com

Results will be delivered electronically via email to Hailey - Hailey@easterlypoint.com.

Global Leader - Results you can trust

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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

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

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

☐ **Melbourne Laboratory**
2 Kingston Town Close Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company: Easterly Point Environmental Pty Ltd
Address: Unit 1/64 Kingsley St, Byron Bay NSW 2481
Contact Name: Hailey Spry
Phone №: 02 6685 6681
0418 336 178
Special Directions:
Purchase Order:
Quote ID №:

Project №: 21029
Project Name: Yamba

Project Manager: Hailey Spry
EDD Format (ESdat, EQuIS etc):

Sampler(s): Hailey Spry
Handed over by: HS
Email for Invoice: hailey@easterlypoint.com
Email for Results: As above

Analyses
Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers
Change container type & size if necessary.

Required Turnaround Time (TAT)
Default will be 5 days if not ticked.
♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☐ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	HOLD	B1 TRHs/BTEX	B15G: TRH (s.g)/BTEX	B6: 8 Metals, TRH, BTEX	B14: OCPs/OPPs	M8: 8 Metals	B10: TRH, BTEX, PAH Metals OCPs, OPPs	B7: TRH, BTEX, PAH, Metals	TRH Silica Gel	Asbestos NEPM 0.001% w/w						500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01_0.0-0.1	12/7/22	S							X		X													X		
2	BH01_0.2-0.3	↓	↓			X																			X		
3	BH02_0.0-0.1	↓	↓				X																		X		
4	BH02_0.3-0.4	↓	↓	X																					X		
5	BH03_0.0-0.1	↓	↓			X		X	X																X		
6	BH03_0.15-0.25	↓	↓	X																					X		
7	BH04_0.1-0.2	↓	↓							X															X		
8	BH04_0.3-0.35	↓	↓							X			X												X		
9	BH05_0.0-0.1	↓	↓			X																			X		
10	BH06_0.0-0.1	↓	↓							X			X												X		
		Total Counts																									

Method of Shipment: ✓ Courier (# TNT) ☐ Hand Delivered ☐ Postal Name: Hailey Spry Signature: Date: 13/7/22 Time:

Eurofins | mgt Laboratory Use Only									
Received By	Paige Howarth	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	14/7/22	Time	11:30AM	Temperature 8.9
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report № 905836

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[illegible]

Page 1 of 3

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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

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

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

☐ **Melbourne Laboratory**
2 Kingston Town Close Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company Easterly Point Environmental Pty Ltd
Address Unit 1/64 Kingsley St, Byron Bay NSW 2481
Contact Name Hailey Spry
Phone №
Special Directions
Purchase Order
Quote ID №

Project № 21029
Project Name Yamba
Project Manager Hailey Spry
EDD Format ESdat, EQuIS etc
Sampler(s)
Handed over by
Email for Invoice
Email for Results

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers Change container type & size if necessary

Required Turnaround Time (TAT) Default will be 5 days if not ticked.
♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☐ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B1	B15G	B6	B14	M8	B10	B7	TRHs Silica Gel	Asbestos	HOLD	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH06_0.3-0.4								X													
2	BH07_0.0-0.1								X			X										
3	BH07_0.15-0.25								X			X										
4	BH07_0.3-0.35								X													
5	BH08_0.0-0.1								X		X											
6	BH08_0.15-0.2								X		X											
7	BH08_0.4-0.45								X		X											
8	BH09_0.0-0.1								X													
9	BH09_0.2-0.25												X									
10	Sed01								X		X											
		Total Counts																				

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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

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

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

☐ **Melbourne Laboratory**
2 Kingston Town Close Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company Easterly Point Environmental Pty Ltd

Address Unit 1/64 Kingsley St, Byron Bay NSW 2481

Contact Name Hailey Spy

Phone №

Special Directions

Purchase Order

Quote ID №

Project № 21029

Project Name Yamba

Project Manager Hailey Spy

EDD Format ESdat, EQuIS etc

Sampler(s)

Handed over by

Email for Invoice

Email for Results

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers Change container type & size if necessary

Required Turnaround Time (TAT) Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☐ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B1	B15G	B6	B14	M8	B10	B7	Asbestos		500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	SS01	12/7/22	S			X															
2	ASSBH04_0.1-0.2	↓	↓			X	X														
3	ASSBH06_0.6-08					X															
4	ASSBH10_0.25					X															
5	ASSBH13-0.1-0.2					X	X														
6	ASSBH06_0.1-0.2					X	X														
7	QC01								X												
8	QC02								X	Please Fwd to ALS for analysis											
9	QC03								X												
10	QC04								X	Please Fwd to ALS for analysis											
	QC05 Total Count		W						X												

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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Page 3 of 3

CERTIFICATE OF ANALYSIS

Work Order : **EB2220560**
Client : **EASTERLY POINT ENVIRONMENTAL PTY LTD**
Contact : HAILEY SPRY
Address : PO BOX 2363
BYRON BAY NSW, AUSTRALIA 2481
Telephone : ----
Project : 21029 Yamba
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/333
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 7
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 14-Jul-2022 16:16
Date Analysis Commenced : 14-Jul-2022
Issue Date : 20-Jul-2022 17:10

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
Matt Frost	Assistant Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

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

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

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

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

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

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

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

- 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.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**QC02**	**QC04**	**----**	**----**	**----**
			Sampling date / time	12-Jul-2022 00:00	12-Jul-2022 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EB2220560-001**	**EB2220560-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**30.1**	**35.5**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**7**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**4**	**11**	----	----	----
Copper	7440-50-8	5	mg/kg	**7**	**8**	----	----	----
Lead	7439-92-1	5	mg/kg	**6**	**9**	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	**8**	----	----	----
Zinc	7440-66-6	5	mg/kg	**109**	**38**	----	----	----
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	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**QC02**	**QC04**	**----**	**----**	**----**
			Sampling date / time	12-Jul-2022 00:00	12-Jul-2022 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EB2220560-001**	**EB2220560-002**	**--------**	**--------**	**--------**
				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	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	----	----	----
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	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**QC02**	**QC04**	**----**	**----**	**----**
			Sampling date / time	12-Jul-2022 00:00	12-Jul-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	**EB2220560-001**	**EB2220560-002**	**--------**	**--------**	**--------**
				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	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	**160**	**150**	----	----	----
C29 - C36 Fraction	----	100	mg/kg	**110**	**160**	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	**270**	**310**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	**60**	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	**200**	**260**	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	**110**	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	**260**	**370**	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	**60**	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	QC02	QC04	----	----	----
			Sampling date / time	12-Jul-2022 00:00	12-Jul-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2220560-001	EB2220560-002	--------	--------	--------
				Result	Result	----	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**105**	**111**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**112**	**118**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**114**	**116**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**104**	**104**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**104**	**108**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**106**	**106**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**98.4**	**99.4**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**102**	**109**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**70.3**	**71.0**	----	----	----
Toluene-D8	2037-26-5	0.2	%	**63.0**	**64.2**	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**76.3**	**76.8**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

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

QUALITY CONTROL REPORT

Work Order	: **EB2220560**	Page	: 1 of 9
Client	: **EASTERLY POINT ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: HAILEY SPRY	Contact	: Customer Services EB
Address	: PO BOX 2363 BYRON BAY NSW, AUSTRALIA 2481	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: 21029 Yamba	Date Samples Received	: 14-Jul-2022
Order number	: ----	Date Analysis Commenced	: 14-Jul-2022
C-O-C number	: ----	Issue Date	: 20-Jul-2022
Sampler	: ----		
Site	: ----		
Quote number	: EN/333		
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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	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.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4460134)									
EB2220555-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	13	10	31.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	11	10	13.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	36	39	8.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	58	50	15.0	0% - 50%
EB2220556-036	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	3	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4460143)									
EB2219545-007	Anonymous	EA055: Moisture Content	----	0.1	%	16.1	16.6	3.2	0% - 50%
EB2220555-004	Anonymous	EA055: Moisture Content	----	0.1	%	16.2	17.3	6.3	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4460144)									
EB2220560-002	QC04	EA055: Moisture Content	----	0.1	%	35.5	32.1	10.1	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4460135)									
EB2220555-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EB2220556-036	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4460140)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4460140) - continued									
EB2220556-015	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 4460140)									
EB2220556-015	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 4460140) - continued									
EB2220556-015	Anonymous	EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4460138)									
EB2220560-001	QC02	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EB2220556-015	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4460138) - continued									
EB2220556-015	Anonymous	EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4460133)									
EB2219545-007	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EB2220556-007	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4460139)									
EB2220560-001	QC02	EP071: C15 - C28 Fraction	----	100	mg/kg	160	120	26.2	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	110	<100	9.9	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EB2220556-015	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	120	130	9.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4460133)									
EB2219545-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EB2220556-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4460139)									
EB2220560-001	QC02	EP071: >C16 - C34 Fraction	----	100	mg/kg	200	150	24.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	60	<50	0.0	No Limit
EB2220556-015	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	110	120	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	200	200	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 4460133)									
EB2219545-007	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EB2220556-007	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4460134)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	83.4 mg/kg	120	84.0	123
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
EG005T: Chromium	7440-47-3	2	mg/kg	<2	14.1 mg/kg	113	83.0	125
EG005T: Copper	7440-50-8	5	mg/kg	<5	50 mg/kg	100	86.0	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	55.4 mg/kg	103	84.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	11.8 mg/kg	112	81.5	118
EG005T: Zinc	7440-66-6	5	mg/kg	<5	148.7 mg/kg	106	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4460135)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	102	70.0	125
EP068A: Organochlorine Pesticides (OC) (QCLot: 4460140)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.9	72.8	127
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	71.0	127
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	94.1	67.5	126
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	72.7	127
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.3	70.6	122
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	64.8	127
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	99.6	72.4	122
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	101	67.4	125
EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	99.9	65.6	124
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.8	70.4	122
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	100	65.6	125
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	100	69.1	124
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	72.4	125
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	63.2	127
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.0	69.7	120
EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	61.2	124
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	55.5	125
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	57.1	117
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	92.5	51.9	125
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	93.6	46.5	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	75.0	34.0	130

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 4460140) - continued								
EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4460140)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	93.1	55.8	126
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	45.9	136
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	30.6	20.0	147
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	44.1	125
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	102	70.3	125
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	101	63.2	124
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	97.8	44.2	129
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	108	52.3	133
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	62.9	126
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	69.2	123
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	88.4	37.6	138
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	110	59.6	131
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	46.4	144
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	108	56.8	128
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	24.4	135
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	105	55.9	123
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	45.0	138
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	41.6	141
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	49.1	20.0	145
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4460138)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	1.5 mg/kg	105	72.6	133
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	1.5 mg/kg	98.0	63.2	144
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	1.5 mg/kg	98.8	66.0	132
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	1.5 mg/kg	99.8	76.2	134
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	1.5 mg/kg	98.7	71.8	137
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	1.5 mg/kg	109	77.1	143
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.5 mg/kg	114	74.1	140
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	1.5 mg/kg	117	72.0	139
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.5 mg/kg	120	58.0	145
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	1.5 mg/kg	121	63.0	147
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	1.5 mg/kg	103	70.5	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	1.5 mg/kg	101	75.5	138
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.5 mg/kg	94.8	68.5	140

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	**CAS Number**	**LOR**	**Unit**	**Result**	**Concentration**	**LCS**	**Low**	**High**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4460138) - continued								
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.5 mg/kg	102	58.4	143
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	1.5 mg/kg	108	52.1	149
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.5 mg/kg	103	64.6	140
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4460133)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	18 mg/kg	89.5	64.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4460139)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	310 mg/kg	108	79.4	125
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	490 mg/kg	109	78.8	122
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4460133)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	22.5 mg/kg	90.9	58.1	124
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4460139)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	450 mg/kg	108	81.0	132
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	320 mg/kg	113	67.2	130
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080: BTEXN (QCLot: 4460133)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	87.5	68.0	107
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	91.4	69.0	108
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	88.3	68.0	109
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	97.1	70.0	114
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	104	74.0	116
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	93.1	74.0	109

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	**Sample ID**	**Method: Compound**	**CAS Number**	**Concentration**	**MS**	**Low**	**High**
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4460134)							
EB2220555-002	Anonymous	EG005T: Arsenic	7440-38-2	100 mg/kg	90.6	70.0	130
		EG005T: Cadmium	7440-43-9	25 mg/kg	92.4	70.0	130
		EG005T: Chromium	7440-47-3	100 mg/kg	92.6	70.0	130
		EG005T: Copper	7440-50-8	100 mg/kg	96.2	70.0	130
		EG005T: Lead	7439-92-1	100 mg/kg	111	70.0	130
		EG005T: Nickel	7440-02-0	100 mg/kg	91.0	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4460134) - continued							
EB2220555-002	Anonymous	EG005T: Zinc	7440-66-6	100 mg/kg	# 137	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4460135)							
EB2220555-002	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	100	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 4460140)							
EB2220556-030	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	91.9	70.0	136
		EP068: Heptachlor	76-44-8	0.5 mg/kg	95.0	65.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	94.6	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	94.7	67.0	129
		EP068: Endrin	72-20-8	0.5 mg/kg	107	60.0	137
		EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	93.1	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4460140)							
EB2220556-030	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	106	70.0	131
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	99.8	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	109	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	108	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	105	70.0	134
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4460138)							
EB2220555-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	1.5 mg/kg	104	66.0	132
		EP075(SIM): Pyrene	129-00-0	1.5 mg/kg	130	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4460133)							
EB2219545-009	Anonymous	EP080: C6 - C9 Fraction	----	8 mg/kg	95.6	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4460139)							
EB2220555-004	Anonymous	EP071: C10 - C14 Fraction	----	310 mg/kg	111	70.0	130
		EP071: C15 - C28 Fraction	----	490 mg/kg	123	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4460133)							
EB2219545-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	94.3	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4460139)							
EB2220555-004	Anonymous	EP071: >C10 - C16 Fraction	----	450 mg/kg	110	70.0	130
		EP071: >C16 - C34 Fraction	----	320 mg/kg	126	70.0	130
EP080: BTEXN (QCLot: 4460133)							
EB2219545-009	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	85.4	70.0	130
		EP080: Toluene	108-88-3	2 mg/kg	90.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2220560**	Page	: 1 of 5
Client	: **EASTERLY POINT ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: HAILEY SPRY	Telephone	: +61-7-3243 7222
Project	: 21029 Yamba	Date Samples Received	: 14-Jul-2022
Site	: ----	Issue Date	: 20-Jul-2022
Sampler	: ----	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	**Analyte**	CAS Number	Data	Limits	**Comment**
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	EB2220555--002	Anonymous	**Zinc**	7440-66-6	137 %	70.0-130%	**Recovery greater than upper data quality objective**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container */ Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QC02, QC04	**12-Jul-2022**	**----**	----	----	**14-Jul-2022**	26-Jul-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QC02, QC04	**12-Jul-2022**	**15-Jul-2022**	08-Jan-2023	✓	**19-Jul-2022**	08-Jan-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QC02, QC04	**12-Jul-2022**	**15-Jul-2022**	09-Aug-2022	✓	**19-Jul-2022**	09-Aug-2022	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) QC02, QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**18-Jul-2022**	24-Aug-2022	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) QC02, QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**18-Jul-2022**	24-Aug-2022	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC02, QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**18-Jul-2022**	24-Aug-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) QC02, QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**15-Jul-2022**	26-Jul-2022	✓
Soil Glass Jar - Unpreserved (EP071) QC02, QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**18-Jul-2022**	24-Aug-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method **Container** / Client Sample ID(s)		**Sample Date**	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	**Date analysed**	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
QC02,	QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**15-Jul-2022**	26-Jul-2022	✓
Soil Glass Jar - Unpreserved (EP071)								
QC02,	QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**18-Jul-2022**	24-Aug-2022	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
QC02,	QC04	**12-Jul-2022**	**15-Jul-2022**	26-Jul-2022	✓	**15-Jul-2022**	26-Jul-2022	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		*Count*		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2220560**

Client : **EASTERLY POINT ENVIRONMENTAL PTY LTD**
Contact : HAILEY SPRY
Address : PO BOX 2363
BYRON BAY NSW, AUSTRALIA 2481

E-mail : hailey@easterlypoint.com
Telephone : ----
Facsimile : ----

Project : 21029 Yamba
Order number : ----
C-O-C number : ----
Site : ----
Sampler :

Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053

E-mail : ALSEnviro.Brisbane@alsglobal.com
Telephone : +61-7-3243 7222
Facsimile : +61-7-3243 7218

Page : 1 of 2
Quote number : EB2017EASPOI0001 (EN/333)
QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 14-Jul-2022 16:16
Client Requested Due Date : 22-Jul-2022

Issue Date : 14-Jul-2022
Scheduled Reporting Date : **22-Jul-2022**

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1
Receipt Detail : SMALL HARD ESKY

Security Seal : Intact.
Temperature : 9.0°C - Ice Bricks present
No. of samples received / analysed : 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - S-12 OC/OP Pesticides	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EB2220560-001	12-Jul-2022 00:00	QC02	✓	✓	✓
EB2220560-002	12-Jul-2022 00:00	QC04	✓	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

HAILEY SPRY

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

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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

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

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

☐ **Melbourne Laboratory**
2 Kingston Town Close Oakleigh Vic 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company Easterly Point Environmental Pty Ltd
Address Unit 1/64 Kingsley St, Byron Bay NSW 2481
Contact Name Hailey Spy
Phone №
Special Directions
Purchase Order
Quote ID №

Project № 21029
Project Name Yamba
Project Manager Hailey Spy
EDD Format (Esdat, EQuIS, etc)
Sampler(s)
Handed over by
Email for Invoice
Email for Results

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Required Turnaround Time (TAT) Default will be 5 days if not ticked

◆Surcharge will apply
☐ Overnight (reporting by 9am)◆
☐ Same day◆ ☐ 1 day◆
☐ 2 days◆ ☐ 3 days◆
☐ 5 days (Standard)
☐ Other( )

Containers Change container type & size if necessary

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B1	B15G	B6	B14	M6	B10	B7	Asbestos	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	SS01	12/7/22	S			X														
2	ASSBH04_0.1-0.2	↓	↓			X	X													
3	ASSBH06_0.6-0.8					X														
4	ASSBH10_0.25					X														
5	ASSBH13_0.1-0.2					X	X													
6	ASSBH06_0.1-0.2					X	X													
7	QC01								X											
8	QC02								X	Please Fwd to ALS for analysis										
9	QC03								X											
10	QC04								X	Please Fwd to ALS for analysis										
	QC05		Total Count N						X											

Environmental Division
Brisbane
Work Order Reference
EB2220560

Telephone : + 61-7-3243 7222

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Signature Date Time

Eurofins | mgt Laboratory Use Only

Received By ALS SYD | [✓ BNE] | MEL | PER | ADL | NTL | DRW Signature Date 14/7/22 Time 1616 Temperature

Received By SYD | BNE | MEL | PER | ADL | NTL | DRW Signature Date Time Report №

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Page 2 of 3

Certificate of Analysis

Easterly Point Environmental Pty Ltd
1/64 Kingsley Street
Byron Bay
NSW 2481

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention:	**Hailey**
Report	**909562-S**
Project name	YAMBA REBATCH
Project ID	21029
Received Date	Jul 28, 2022

Client Sample ID			**BH05_0.0-0.1**
Sample Matrix			**Soil**
Eurofins Sample No.			**B22-Jl0057835**
Date Sampled			**Jul 12, 2022**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	14
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	24
Copper	5	mg/kg	15
Lead	5	mg/kg	53
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	6.5
Zinc	5	mg/kg	220
% Moisture	1	%	23

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jul 29, 2022	28 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Jul 28, 2022	14 Days

Company Name: Easterly Point Environmental Pty Ltd
Address: 1/64 Kingsley Street
Byron Bay
NSW 2481

Project Name: YAMBA REBATCH
Project ID: 21029

Order No.: N/A
Report #: 909562
Phone: 02 6685 6681
Fax:

Received: Jul 28, 2022 3:16 PM
Due: Jul 29, 2022
Priority: 1 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Lead	AUS Leaching Procedure	Metals M8	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X		
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH07_0.0-0.1	Jul 12, 2022		AUS Leachate	B22-Jl0057834	X	X		
2	BH05_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0057835			X	X
Test Counts						1	1	1	1

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**μg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

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

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Arsenic			mg/kg	< 2			2	Pass	
Cadmium			mg/kg	< 0.4			0.4	Pass	
Chromium			mg/kg	< 5			5	Pass	
Copper			mg/kg	< 5			5	Pass	
Lead			mg/kg	< 5			5	Pass	
Mercury			mg/kg	< 0.1			0.1	Pass	
Nickel			mg/kg	< 5			5	Pass	
Zinc			mg/kg	< 5			5	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	106			80-120	Pass	
Cadmium			%	111			80-120	Pass	
Chromium			%	109			80-120	Pass	
Copper			%	107			80-120	Pass	
Lead			%	110			80-120	Pass	
Mercury			%	111			80-120	Pass	
Nickel			%	105			80-120	Pass	
Zinc			%	106			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M22-Jl0058097	NCP	%	98			75-125	Pass	
Cadmium	M22-Jl0058097	NCP	%	104			75-125	Pass	
Chromium	M22-Jl0058097	NCP	%	95			75-125	Pass	
Copper	M22-Jl0058097	NCP	%	97			75-125	Pass	
Lead	M22-Jl0058097	NCP	%	102			75-125	Pass	
Mercury	M22-Jl0058097	NCP	%	105			75-125	Pass	
Nickel	M22-Jl0058097	NCP	%	98			75-125	Pass	
Zinc	M22-Jl0058097	NCP	%	97			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M22-Jl0058097	NCP	mg/kg	3.4	3.5	1.1	30%	Pass	
Cadmium	M22-Jl0058097	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M22-Jl0058097	NCP	mg/kg	35	36	<1	30%	Pass	
Copper	M22-Jl0058097	NCP	mg/kg	14	14	<1	30%	Pass	
Lead	M22-Jl0058097	NCP	mg/kg	14	15	1.6	30%	Pass	
Mercury	M22-Jl0058097	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M22-Jl0058097	NCP	mg/kg	16	17	1.4	30%	Pass	
Zinc	M22-Jl0058097	NCP	mg/kg	20	20	2.8	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Robert Biviano	Analytical Services Manager
Scott Beddoes	Senior Analyst-Metal

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

Easterly Point Environmental Pty Ltd
1/64 Kingsley Street
Byron Bay
NSW 2481

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention:	**Hailey**
Report	**909562-L**
Project name	YAMBA REBATCH
Project ID	21029
Received Date	Jul 28, 2022

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH07_0.0-0.1** **AUS Leachate** **B22-Jl0057834** **Jul 12, 2022**
Heavy Metals			
Lead	0.01	mg/L	0.16
AUS Leaching Procedure			
Leachate Fluid^{C01}		comment	4.0
pH (initial)	0.1	pH Units	6.8
pH (Leachate fluid)	0.1	pH Units	7.0
pH (off)	0.1	pH Units	6.7

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Brisbane	Jul 29, 2022	28 Days
AUS Leaching Procedure - Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes	Brisbane	Jul 29, 2022	7 Days

Company Name: Easterly Point Environmental Pty Ltd
Address: 1/64 Kingsley Street
Byron Bay
NSW 2481

Project Name: YAMBA REBATCH
Project ID: 21029

Order No.: N/A
Report #: 909562
Phone: 02 6685 6681
Fax:

Received: Jul 28, 2022 3:16 PM
Due: Jul 29, 2022
Priority: 1 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Lead	AUS Leaching Procedure	Metals M8	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X		
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH07_0.0-0.1	Jul 12, 2022		AUS Leachate	B22-JI0057834	X	X		
2	BH05_0.0-0.1	Jul 12, 2022		Soil	B22-JI0057835			X	X
Test Counts						1	1	1	1

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

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

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
LCS - % Recovery									
Heavy Metals									
Lead			%	82			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	B22-Jl0057834	CP	%	82			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	B22-Jl0057834	CP	mg/L	0.16	0.16	1.9	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised by:

Robert Biviano	Analytical Services Manager
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Sample Properties

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

Company Name: Easterly Point Environmental Pty Ltd
Address: 1/64 Kingsley Street
Byron Bay
NSW 2481

Project Name: YAMBA REBATCH
Project ID: 21029

Order No.: N/A
Report #: 909562
Phone: 02 6685 6681
Fax:

Received: Jul 28, 2022 3:16 PM
Due: Jul 29, 2022
Priority: 1 Day
Contact Name: Hailey

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Lead	AUS Leaching Procedure	Metals M8	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254								X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X		
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH07_0.0-0.1	Jul 12, 2022		AUS Leachate	B22-Jl0057834	X	X		
2	BH05_0.0-0.1	Jul 12, 2022		Soil	B22-Jl0057835			X	X
Test Counts						1	1	1	1

eurofins | Environment Testing

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle	Perth	Auckland	Christchurch
6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217	Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091	1/21 Smallwood Place Murarrie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079	46-48 Banksia Road Welshpool WA 6106 Tel: +61 8 6253 4444 NATA# 2377 Site# 2370	35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290

Sample Receipt Advice

Company name:	Easterly Point Environmental Pty Ltd
Contact name:	Hailey
Project name:	YAMBA REBATCH
Project ID:	21029
Turnaround time:	1 Day
Date/Time received	Jul 28, 2022 3:16 PM
Eurofins reference	909562

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

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

Robert Biviano on phone : or by email: RobertoBiviano@eurofins.com

Results will be delivered electronically via email to Hailey - Hailey@easterlypoint.com.

Global Leader - Results you can trust

From: Roberto Biviano <RobertoBiviano@eurofins.com>
Sent: Thursday, 28 July 2022 3:24 PM
To: #AU04_Enviro_Sample_NSW <EnviroSampleNSW@eurofins.com>; Emma Beesley <EmmaBeesley@eurofins.com>; Roopesh Rangarajan <RoopeshRangarajan@eurofins.com>
Subject: ADDITIONAL = Fw: Eurofins Test Results, Invoice - Report 905836 : Site YAMBA (21029)

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

24hr tat please

Please let me know the report number when logged

From: Hailey Spry <hailey@easterlypoint.com>
Sent: Thursday, July 28, 2022 3:16 PM
To: Emma Beesley <EmmaBeesley@eurofins.com>; Roberto Biviano <RobertoBiviano@eurofins.com>
Subject: RE: Eurofins Test Results, Invoice - Report 905836 : Site YAMBA (21029)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.
Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Emma and Rob,

Thanks for the sending the reports through.

Regarding this project, can I please add some additional samples for analysis:

sample		analysis
BH05	0.0-0.1	Metals (8)
BH07	0.0-0.1	ASLP Lead

JL0028843 M
JL0028846 BSJL197.

Thanks,

Hailey Spry (Murphy)
Principal Environmental Scientist
MEIANZ, CEnvP SCS

Easterly Point Environmental Pty Ltd

∗ M 0418 336 178 ∗ T (02) 6685 6681 ∗ hailey@easterlypoint.com ∗ www.easterlypoint.com

∗ LinkedIn: https://www.linkedin.com/in/hailey-spry-4636aa31/